Course Requirements for a minor in Youth Ministry (21 hours)
(Restricted to non-Christian Ministry majors only)

A minor in Youth Ministry will consist of Christian Ministries 112, 238, 258, 480 (3 hours); Religion 217; and six additional hours from Christian Ministries 122, 228, 248, 313, 321, 322, 361, 412, Religion 237, 238, 248, 255, or 320.

Pre-Theological Concentration

Pre-theological students should plan their program with the help of the Chair of the Department of Biblical and Religious Studies and Philosophy.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

RELIGION (RELI)

RELI 211. OLD TESTAMENT LITERATURE AND HISTORY. An introduction to the literature, content, and history of the Old Testament. Special attention is given to the historical background, composition, and theological message of the Old Testament. The course further acquaints students with the basic methods of Old Testament studies and the present state of Old Testament research.
Semester course, three hours.

RELI 212. NEW TESTAMENT LITERATURE AND HISTORY. An introduction to the literature, content, and history of the New Testament. Special attention is given to the historical background, composition, and theological message of the New Testament. The course further acquaints students with the basic methods of New Testament studies and the present state of New Testament research. This course contains the second component of the general education Information Literacy (IL) requirement for students substituting Religion 211 and 212 for the Humanities 102 requirement.
Semester course, three hours.

RELI 217. CHRISTIAN DOCTRINE. An introduction to the methods of systematic theology in terms of narrative, covenant and creed, and an examination of the central doctrines of historic Christianity, including Revelation and Scripture, the being and attributes of God, Humanity, the Person and Work of Christ, the Person and Work of the Holy Spirit, the Christian Life, the Church and the Sacraments, and the Last Things. *Fall semester only, three hours.*

RELI 218. INTERPRETING THE BIBLE. An introduction to the skills necessary for understanding a Biblical passage's meaning in each Bible genre. Skills addressed will range from establishing the text, comparing translations and observing the text, to rules for proper interpretation, to applying the text to Christians today accurately. Advanced skills will also be taught, including mastering a Bible book, legitimately finding Christ in (even Old Testament) Biblical texts, typology, and dealing with difficult texts. *Spring semester only, three hours.*

RELI 220. CHRISTIANITY AND THE FUNDAMENTAL QUESTIONS OF LIFE. The course concerns some of the fundamental questions such as: What is a good person? What is a good life? What is a good society? What is/are the human problem(s)? How do we understand human nature? What is the Christian view of justice, right and wrong, good and evil? Not all of these questions will be addressed in every class. Answers to these questions will involve a study of the Christian tradition of politics, including the Bible and contemporary interpreters, although not all of these sources will be utilized in every class. *Alternate years, semester course, three hours.*

RELI 221. THE LIFE OF CHRIST. This course aims to give the student a good understanding of the person, work, and teachings of Christ as presented in the Gospels. It also seeks to introduce the student to some of the important literature on the subject.
Alternate years, semester course, three hours.

RELI 232. THE LIFE AND WORK OF PAUL. A study of the life and work of the apostle Paul, author of almost one-half of the New Testament. Attention is given to both the descriptive material in the book of Acts and the thematic material from the Pauline Epistles. Students are introduced to current issues in the study of Paul. *Alternate years, semester course, three hours.*

RELI 235. BIBLICAL IDEAS. This course will draw together Biblical, systematic, and pastoral/practical theological styles and methods. In doing so, the class will expose students to some of the great concepts of the Bible such as the fear of the Lord, the call to care for the elderly, fasting, tithing and the Sabbath. Along with this, the class will equip students with basic Biblical studies skills needed for their own continuing theological reflection in the years to come. Prerequisites: One of Humanities 102 or Religion 211 and 212. *Alternate years, semester course, three hours.*

RELI 237. OLD TESTAMENT BIBLICAL BOOKS. This course will examine the genre, themes, theology, and practical application of one Old Testament book. The Old Testament book studied will differ each semester. *Semester course, three hours.*

RELI 238. NEW TESTAMENT BIBLICAL BOOKS. This course will examine the genre, themes, theology, and practical application of one New Testament book. The New Testament book studied will differ each semester. *Semester course, three hours.*

RELI 246. CHRISTIAN EDUCATION FOR YOUTH AND ADULTS. This course intends to aid persons who plan to lead youth and adults in the Christian education environment. It will include a consideration of objectives; of historical, theological, and psychological background of methods and programming resources; and of techniques for outreach.
Alternate years, semester course, three hours.

RELI 247. CONTEMPORARY AMERICAN RELIGION. This course seeks to examine and explore the prominent place of religion in this religiously pluralistic nation by describing and analyzing current American religious developments in historical, sociological, and theological perspective. Institutional and non-institutional developments within and outside the Judeo-Christian tradition will also be examined. *Alternate years, semester course, three hours.*

RELI 248. WORLD RELIGIONS. An introduction to the major living religions, to the leading problems of religious thought, and to the alternative approaches of world religions to ultimate questions concerning the meaning of human life. *Semester course, three hours.*

RELI 251. LEADERSHIP IN CHRISTIAN MINISTRIES. This course concentrates on the leadership, organization and administration of the programs and activities of the local church and the many "parachurch" organizations. Sound principles or servant leadership are emphasized in a context of biblical teaching. *Alternate years, semester course, three hours.*

RELI 253. PHILOSOPHY OF MINISTRY. Scripture, history, culture, and sociology play significant roles in the formulation of a philosophy of ministry. This course seeks to help the student understand how these factors affect the various fields of ministry.
Alternate years, semester course, three hours.

RELI 255. DEFENDING THE FAITH. This course will investigate evidential, presupposition, postmodern, and other approaches to apologetics. The emphasis will be on the epistemological stance one should take in apologetic encounters. A portion of this course will focus on responses to various objections and concerns that one is likely to face in apologetic encounters.
Semester course, three hours.

RELI 260. INDEPENDENT STUDY. Individual study of specialized topics in religion. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

RELI 261. C.S. LEWIS: CHRISTIAN APOLOGIST. A study of one of contemporary Christianity's greatest apologists. The primary subject of study is Lewis' unique contributions to apologetics including his epistemology, view of myth, and defense of supernaturalism. Various examples of Lewis' writings are examined from selected essays and theological articles and the *Chronicles of Narnia*. *Semester course, three hours.*

RELI 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in religion. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

RELI 290. STUDIES IN RELIGION. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of religion. The aim of such a course is in-depth study of some specific facet of religion with particular emphasis on the relationship of religion and contemporary life. *Semester course, three hours.*

RELI 317. THE DOCTRINE OF GOD. This course examines how the church formulated the classical, creedal doctrine of God, and how this was subsequently developed. Particular attention will be paid to primary texts and to the manner in which theology proper (the doctrine of God) also had implications both for Christology and for the way in which the church read the Bible. It will also address the reasons why classical theism has been challenged in recent times, and will culminate in a discussion of the importance of the recovery of classical theism in the church today. Above all, the course's watchword will be the notion *lex credendi est lex orandi - the rule of believing is the rule of praising* - and will seek to connect doctrine with praise. *Semester course, three hours.*

RELI 320. THEOLOGY OF MISSIONS. A survey of the greatest evangelistic and mission movements in history, the Biblical-theological basis for missions, and contemporary developments in mission strategy. *Alternate years, semester course, three hours.*

RELI 325. BIBLICAL THEOLOGY OF WORSHIP. This course will discuss the sacred places, people, offerings and festivals of the Old Testament and their relation to the New. The class traces the redemptive-historical development of forms of worship from the Garden of Eden to the exilic period and beyond into the New Testament. The focus of the course will be primarily exegetical, interacting with the Biblical materials rather than with historical-critical approaches. The goal of the course is to form a solid Biblical basis from which to address the issues of worship which face the contemporary church. *Alternate years, semester course, three hours.*

RELI 330. THEOLOGY OF THE SPIRITUAL LIFE. This course examines writings on spiritual formation from an historical, theological, and Biblical perspective. Key topics include the holiness of God, the person and work of the Holy Spirit, prayer, Bible Study, and the discernment of God's will. *Semester course, three hours.*

RELI 341. CHRISTENDOM AND REFORM. A study of the history of Christianity from the time of Charlemagne until the end of the Religious Wars in 1648, this course will explore Christianity throughout the Medieval Period, as tensions and then schism arose between the Greek and Latin Churches, and then go into the Reformation era with its various callings for reform of the Western Church. Emphasis will be placed on important persons and ideas, movements of significance, and the relationship of the Christian mission to surrounding culture.
Alternate years, semester course, three hours.

RELI 345. LUTHER AND CALVIN. This course focuses on the Reformation leaders whose work and ideas shaped Protestantism. Primary sources will be used.
Alternate years, semester course, three hours.

RELI 351. HERMENEUTICS. A study of central issues of Biblical interpretation that bear directly on current concerns of human existence. This course examines the import and implications of the Biblical literature. *Alternate years, semester course, three hours.*

RELI 360. INDEPENDENT STUDY. An opportunity for junior and senior students with previous background in religion to do intensive independent study of specialized topics. Prerequisites: Twelve hours of religion coursework, permission of the department chair, and a faculty sponsor.
Semester course, one to three hours.

RELI 362. CONTEMPORARY THEOLOGY. A study of major themes in contemporary theology including such topics as religious language, views of God, meaning of man and redemption, and the problem of evil. These topics are discussed as they relate to contemporary cultures and worldviews.
Alternate years, semester course, three hours.

RELI 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in religion. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

RELI 390. ADVANCED STUDIES IN RELIGION. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of religion. The aim of such courses is in-depth study of some specific facet of religion with particular emphasis on the relationship of religion and contemporary life. *Semester course, three hours.*

RELI 450. CHRIST AND THE MEDIA. This course provides an historical survey and a Biblical-Theistic interaction with how human media shape the social environment and structure human thought. Taught as a seminar, students read and discuss Plato, Ong, Postman, McLuhan, and others who have contributed to understanding of orality, literacy, image, and electronic media.
Fall semester only, three hours.

RELI 460. INDEPENDENT STUDY. An opportunity for junior and senior students with previous background in religion to do intensive independent study of specialized topics. Prerequisites: Twelve hours of religion coursework, permission of the department chair, and a faculty sponsor.
Semester course, one to three hours.

RELI 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in religion. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

RELI 480. INTERNSHIP IN RELIGION. This course offers practical experience appropriate for the Christian Ministries auxiliary field. Prerequisites: Consent of the department chair.
Semester course, one to six hours.

RELI 488. SENIOR SEMINAR. This course satisfies the Writing Intensive (WI), Speaking Intensive (SI), Information Literacy (IL) requirements for the Biblical and Religious Studies major, and will be taken in the fall of the senior year. Topics will focus on a major issue in biblical studies, church history, or systematic theology. *Fall semester only, three hours.*

RELI 499. HONORS COURSE IN RELIGION. Advanced research in Biblical and Religious Studies is available to students on an individual basis and by prearrangement with the department.
Semester course, one, two or three hours.

CHRISTIAN MINISTRIES (CMIN)

CMIN 112. INTRODUCTION TO YOUTH MINISTRY. This course will offer a broad overview of the field of youth ministry. This will include vocational questions, a brief study of ecclesiology, a survey of adolescent developmental issues, a consideration of ministry philosophies and programming approaches, and some important practical questions related to pastoral ethics and spiritual health.
Alternate years (even), fall semester only, three hours.

CMIN 122. INTRODUCTION TO CHRISTIAN MINISTRIES. This course will introduce the student to the principles of Christian Ministry in contemporary society. Particular attention will be

placed on biblical foundations of Christian education, Youth Ministry, para-church ministries, the local church, history of Christian education, and the educator as the agent of change.
Alternate years (odd), fall semester only, three hours.

CMIN 228. CHRIST AND CULTURE. This course will survey some of the broad contours of culture, as well as how these cultural realities impact the way we "live and move and have our being..." (borrowed from Acts 17:28). Aside from exploring the cultural landscape, this course will focus on three essential questions: 1. What is the nature of our engagement as Christians with a culture that is not Christian? 2. How are we to exegete and respond to products and artifacts produced by the culture? 3. How do we communicate the gospel into the language and context of another culture not our own? *Spring semester only, three hours.*

CMIN 238. SPIRITIUAL FORMATION. This course serves as a core course for the Christian Ministry major. It is designed to be a reflective, interactive, and deeply shaping course in our lives as we pursue an understanding of holistic spiritual formation. The purpose of this course is to equip students in both the theory and practice of spiritual growth and development. This course focuses on our personal relationship with God. We will seek to develop an understanding of the necessary aspect of personal spirituality for ourselves through evaluation of Scripture and through self-reflection and discipline. Particular attention will be given to the psychology of faith and religion and to the influences of home and family on the development of faith. *Fall semester only, three hours.*

CMIN 248. DISCIPLESHIP AND EVANGELISM. The course will address the theology, ministry, and implementation of biblical evangelism and discipleship. There will be various exposures to evangelism and discipleship methodology which will require the integration of various projects, guest lecturers, small-group assignments, and possible field trips. Emphasis will be placed on strategies for contemporary culture, youth culture, and other ministry contexts such as urban ministry and the mission field. *Spring semester only, three hours.*

CMIN 258. COMMUNICATING THE GOSPEL. This course is designed to train students in the concepts and skills necessary to effectively communicate from the scripture. This phase of the Christian Ministry curriculum will focus on general communication skills, sermon design, preaching technique, with special emphasis on teaching and preaching the Word of God. This course satisfies the Writing Intensive (WI) and Speaking Intensive (SI) requirements for the Christian Ministries major. *Fall semester only, three hours.*

CMIN 313. NATIONAL YOUTH WORKERS CONFERENCE. This course is a National Youth Workers' Convention-based learning experience, exploring the latest research and trends in the discipline of Youth Ministry. The experience is maximized with university-based pre-readings and follow-up evaluation and discussion. Students will: 1. Develop a background in current youth ministry trends and research; 2. Engage in dialogue with a wide spectrum of reflective youth ministry professionals; 3. Demonstrate skills in learning, reflecting upon, and applying new youth ministry concepts; 4. Progress toward a pattern of continuing ministry and professional education.
Alternate years, fall semester only, one hour.

CMIN 321. LEADERSHIP AND MINISTRY ADMINISTRATION. This course will focus on some of the nuts and bolts areas of every-day ministry in the parish and parachurch setting. It is a course about ministry behind the scenes. So often we think of ministry as what happens "in the front of the room." But authentic leadership has to extend to, and attend to, the "dirty work" that makes possible what happens "in the front of the room." This course explores that "dirty work," and attempts to prepare students for precisely those behind-the-scene tasks that help define the role of a servant-leader. Topics will include leadership, decision-making, staff relationships, budgeting, legal issues, team leadership, evaluation. *Alternate years, spring semester only, three hours.*

CMIN 322. PRINCIPLES AND PRACTICE OF PREACHING AND TEACHING. In this practical laboratory course, designed to give students repeated practice in the skill of communicating the truths of Scripture, students will investigate and develop teaching and preaching skills. The course will review biblically-based and ministry related communication approaches to discern appropriate

goals for biblical instruction, and work to understand how people learn in order to build a strong foundation in both the theory and practice of communication. Students will be offered numerous opportunities to sharpen their skills in teaching, sermon preparation and delivery. Prerequisite: Christian Ministries 258. *Spring semester only, three hours.*

CMIN 361. WORSHIP AND PRAYER MINISTRY. This course examines corporate and private worship and prayer, following the Bible's storyline concerning subjects from Genesis to the book of Revelation. We will establish biblical and theological principles which inform the practice of worship and prayer in the modern church and personal piety.
Alternate years, spring semester only, three hours.

CMIN 412. BIBLICAL COUNSELING. This course equips the student with pastoral care and counseling methods and skills within a ministry context, including counseling various generations (children, youth, adults, and family). It covers an overview of psychological disorders, adolescent and family developmental and crisis issues, pre-, inter-, and post-marital counseling, family counseling, and methods of spiritual direction. *Alternate years, fall semester only, three hours.*

CMIN 480. INTERNSHIP IN CHRISTIAN MINISTRIES. This course is designed to serve as an important practical field experience for students majoring in Christian Ministry. This experience provides broad-based exposure to all ministry and operational facets of any number of Christian ministry programs, whether those be in parish ministry or para-church ministry. The intent is to provide each student with a full-time placement in his or her area of study and/or concentration. In general, each student will assume an approved internship assignment in a local church or parachurch organization, minister in that position for a minimal number of hours, fulfill a number of core and specialization experiences, complete reading and reflection assignments, and evaluate the internship experience. Prerequisites: Christian Ministries 122, 238, and 258. *Semester course, three to six hours.*

CMIN 486. ISSUES IN CONTEMPORARY MINISTRY. This course will examine various topics related to ministry preparedness: calling, ministry readiness and leadership, current cultural/biblical exegesis, and caring for one's own soul. We will review biblical and theological principles which inform the practice of ministry. *Alternate years, spring semester only, three hours.*

GREEK (GREK)

GREK 101. INTRODUCTION TO NEW TESTAMENT GREEK I. A study of the grammar and syntax of New Testament Greek. *Fall semester only, three hours*.

GREK 102. INTRODUCTION TO NEW TESTAMENT GREEK II. Continuation of Greek 101. Prerequisite: Greek 101 or permission of the instructor. *Spring semester only, three hours.*

GREK 201. READINGS IN NEW TESTAMENT GREEK I. Portions of the Gospels will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisites: Greek 101 and 102; or permission of the instructor. *Fall semester only, three hours.*

GREK 202. READINGS IN NEW TESTAMENT GREEK II. Portions of the Pauline Epistles will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisites: Greek 101, 102, and 201; or permission of the instructor. *Spring semester only, three hours.*

GREK 260. INDEPENDENT STUDY. Individual study of specialized topics in Greek. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

GREK 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Greek. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

GREK 360. INDEPENDENT STUDY. An opportunity for third and fourth-year students to do independent projects in basic New Testament exegesis, word study, or classical Greek. Prerequisites: Greek 201 and 202; or consent of instructor. *Semester course, two or three hours.*

GREK 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Greek. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

GREK 460. INDEPENDENT STUDY. An opportunity for third and fourth-year students to do independent projects in basic New Testament exegesis, word study, or classical Greek. Prerequisites: Greek 201 and 202, permission of the department chair, and a faculty sponsor are required. *Semester course, two or three hours.*

GREK 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Greek. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

HEBREW (HEBR)

HEBR 101. INTRODUCTION TO BIBLICAL HEBREW I. A study of the grammar and syntax of the Hebrew Bible. *Fall semester only, three hours.*

HEBR 102. INTRODUCTION TO BIBLICAL HEBREW II. Continuation of Hebrew 101. Prerequisite: Hebrew 101 or permission of the instructor. *Spring semester only, three hours.*

HEBR 201. READINGS IN BIBLICAL HEBREW I. Portions of Narrative Literature will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisites: Hebrew 101 and 102; or permission of the instructor. *Fall semester only, three hours.*

HEBR 202. READINGS IN BIBLICAL HEBREW II. Portions of the Prophets will be read. Vocabulary, grammar, and syntax are reviewed. Prerequisites: Hebrew 101, 102, and 201; or permission of the instructor. *Spring semester only, three hours.*

HEBR 260. INDEPENDENT STUDY. Individual study of specialized topics in Hebrew. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

HEBR 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Hebrew. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

HEBR 360. INDEPENDENT STUDY. An opportunity for third- and fourth-year Hebrew students to do independent projects in basic Old Testament exegesis. Prerequisite: Hebrew 201 and 202; or permission of the instructor. *Semester course, two or three hours.*

HEBR 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Hebrew. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

HEBR 460. INDEPENDENT STUDY. An opportunity for third- and fourth-year Hebrew students to do independent projects in basic Old Testament exegesis. Prerequisite: Hebrew 201 and 202; or permission of the instructor. *Semester course, two or three hours.*

HEBR 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Hebrew. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

LATIN (LATN)

LATN 101. ELEMENTARY LATIN I. This is the beginning course of the elementary Classical Latin sequence. It assumes no previous knowledge of Latin. Students cover the fundamentals of Latin grammar and syntax while building a basic vocabulary. They will begin to read Latin in sentences and edited short selections. *Offered infrequently, semester course, three hours.*

LATN 102. ELEMENTARY LATIN II. This course continues the study of Classical Latin grammar and syntax while continuing to build an extensive Latin vocabulary. It emphasizes the student's ability to read basic unedited Latin prose and poetry. *Offered infrequently, semester course, three hours.*

LATN 201. INTERMEDIATE LATIN I. This course is designed to increase the student's facility in reading Latin prose and poetry from various eras—the Republic, the Empire and Late Antiquity. Strong emphasis is placed on accuracy and efficiency in translation.
Offered infrequently, semester course, three hours.

LATN 202. INTERMEDIATE LATIN II. Further study of Latin prose and poetry to develop proficiency in reading and translating Latin. The focus will be on extensive readings from select Latin authors from antiquity and the Middle Ages. *Offered infrequently, semester course, three hours.*

LATN 260. INDEPENDENT STUDY. Individual study of specialized topics in Latin. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

LATN 290. STUDIES IN LATIN. Readings and discussion of topics in literature or language. Subject matter varies. *Offered periodically, semester course, three hours.*

LATN 360. INDEPENDENT STUDY. An opportunity for third- and fourth-year students to do independent projects in Latin. Prerequisite: Latin 201 and 202; or permission of the instructor.
Semester course, two or three hours.

LATN 460. INDEPENDENT STUDY. An opportunity for third- and fourth-year students to do independent projects in Latin. Prerequisite: Latin 201 and 202; or permission of the instructor.
Semester course, two or three hours

PHILOSOPHY (PHIL)

PHIL 161. INTRODUCTION TO PHILOSOPHY. A course designed to acquaint the student with the various fields and problems of philosophy. Primary sources are used.
Semester course, three hours.

PHIL 191. INTRODUCTION TO ETHICS. An introductory study of philosophical issues related to the moral life, such as: What should we love? How should we treat each other, and why? What does it mean to be a good person, and how might we become better people? and What is human life about, ultimately? Attention will be given to the insights of principle figures in the history of ethics from the ancient period to the present. *Semester course, three hours.*

PHIL 201. SYMBOLIC LOGIC. A study of formal deductive logic with emphasis on testing arguments for validity and translating English statements into symbolic notation.
Semester course, three hours.

PHIL 211. GENERAL LOGIC. A study of reasoning in a variety of contexts. Attention is given to both inductive and deductive arguments. Many kinds of fallacies are studied as well as traditional syllogisms and logical puzzles. Diagramming techniques are developed.
Semester course, three hours.

PHIL 231. ANCIENT PHILOSOPHY. A survey of Western philosophy from the early Greeks through the beginning of the Christian era. Special attention will be given to the philosophies of Plato and Aristotle. Primary sources are used. *Alternate years, semester course, three hours.*

PHIL 232. MEDIEVAL PHILSOPHY. A study of the thought of prominent philosophers from St. Augustine to Ockham, addressing issues such as the nature and existence of God, theories of the good life, and the project of synthesizing Christianity with pagan philosophy. Primary sources are used. *Alternate years, semester course, three hours.*

PHIL 233. MODERN PHILOSOPHY. A survey of Western philosophy from Descartes through Kant, addressing issues pertaining to epistemology (especially the problems of certainty, philosophical methodology, and knowledge of God), and metaphysics (especially the nature of God, free will, and the immortality of the soul). Primary sources are used. *Alternate years, semester course, three hours.*

PHIL 243. SCIENCE AND THE HUMAN: INQUIRY, DESIGN AND THE PERSON. This course will examine historical and contemporary discussions of the nature of scientific inquiry and scientific knowledge, and related questions in the philosophy of science. It will also examine philosophical issues connected with design in nature, origins, and current technological development. Prerequisites: Humanities 102 (or Religion 211 and 212) and a lab science. The lab science may be taken concurrently with this course. This course satisfies the College's SSFT General Education requirement. *Semester course, three hours.*

PHIL 256. GOD, SUFFERING, AND NARRATIVE. A philosophical investigation into the problem of suffering-the problem of reconciling an all-powerful, all-knowing, and perfectly good God with the existence of horrendous evils-with a focus on understanding the differences between argument and narrative as sources of knowledge, the varieties of knowledge, the nature of God and evil, union with God, the relationship between love and the will, the fragmentation of the human self, and the biblical narratives of Abraham and Job. Other works of literature may be used. *Alternate years, semester course, three hours.*

PHIL 260. INDEPENDENT STUDY. Individual study of specialized topics in philosophy. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHIL 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in philosophy. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHIL 271. BIO-MEDICAL ETHICS. An introduction to the ethical issues arising in the field of biomedicine. Topics covered include issues such as abortion, eugenics, euthanasia, organ transplantation, behavior control, the right of a patient to refuse treatment, etc. Sophomore, junior, or senior standing is required. *Semester course, three hours.*

PHIL 290. STUDIES IN PHILOSOPHY. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of philosophy. *Semester course, three hours.*

PHIL 311. METAPHYSICS. Metaphysics examines such basic questions as "What is real?" "What is the nature of basic reality?" and "What is the nature of human beings?" This course will examine some influential discussions of metaphysics arising from these basic questions. Some topics we may discuss include the nature of identity, the relationship between mind and body, free will, and other topics that arise in answering basic metaphysical questions. *Semester course, three hours.*

PHIL 312. EPISTEMOLOGY. Epistemology is the study of the nature and limits of human knowledge, understanding and rationality. Questions covered in this course may include "What is knowledge" "What gives a person a good reason for his/her beliefs?" "What are the limits of human understanding and rationality?" and "What does it mean to achieve excellence in intellectual pursuits?" *Semester course, three hours.*

PHIL 313. ETHICS. The central question of ethics is "How should we live?" This course examines several theories concerning the norms governing human life. Topics may include the nature of happiness, the role of virtue in a life well lived, the relationship between moral rules and right action, the functions of reason and the passions in practical rationality and more.
Alternate years, semester course, three hours.

PHIL 314. PHILOSOPHY OF RELIGION. A sustained philosophical reflection on the nature and existence of God, addressing questions such as the rationality of belief in God, the role of evidence in religious belief, the problem of evil, the moral and cognitive significance of religious experience, and the relationship between God and morality. *Alternate years, semester course, three hours.*

PHIL 340. PHILOSOPHY OF LAW. This course commonly examines such topics as the nature of law, the relationship of law to morality, the problem of judicial interpretation, justice, and rights.
Alternate years, semester course, three hours.

PHIL 360. INDEPENDENT STUDY. An opportunity for sophomore and junior students with previous background in philosophy to do intensive independent study of specialized topics. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two, or three hours.

PHIL 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in philosophy. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

PHIL 390. ADVANCED STUDIES IN PHILOSOPHY. The subject matter for this course will vary each semester to allow for the introduction of new courses in the field of philosophy.
Semester course, three hours.

PHIL 460. INDEPENDENT STUDY. An opportunity for junior and senior students with previous background in philosophy to do intensive independent study of specialized topics. Prerequisite: Twelve hours of philosophy coursework, permission of the department chair, and a faculty sponsor.
Semester course, three hours.

PHIL 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in philosophy. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

PHIL 488. PHILOSOPHY SEMINAR. This course is taught in a seminar style with student-led discussions, a focus on close readings of philosophical works, and a major research project. The course may be repeated, as topics covered vary by semester. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirement for the Philosophy major. Prerequisite: Philosophy 161 or 191, Philosophy 201 or 211, and six hours of Philosophy courses above the 211 level; or permission of the instructor. S*emester course, three hours.*

DEPARTMENT OF BIOLOGY

Dr. Antoszewski, Chair; Dr. Dudt, Dr. Farone, Dr. Jenkins, Dr. Pazehoski, Dr. Stauff, Dr. Wood, Dr. Yowler. Additional Instructional Faculty: Mrs. Lytle, Ms. McCullough, Mrs. Strain, Mr. Sullivan

Course Requirements for Bachelor of Science Degree in Biology—51 hours

Biology Core (17 hours):

Biology 101, 102, 233, 234, and 488.

Groups (18 hours):

Choose one course from *each* of the following groups, as well as additional courses from any group to reach a minimum of 18 hours. Your group course section must include a minimum of three 4-credit lab courses.

Group 1: Molecular Mechanisms and Physiology
Biology 301, 302, 322, 325, 334, 346, and 407.

Group 2: Vertebrate Systems
Biology 310, 313, 314, and 341.

Group 3: Natural History
Biology 305, 323, 326, and 409.

Group 4: Environmental and Ecological Diversity
Biology 320, 328, 331, 403, and 421.

Additional Group Course
Complete one additional course from the groups outlined above.

Biology Electives (4 hours):

Choose four hours from any additional Biology offerings. See the College *Bulletin* for Biology offerings not listed above. Note: Independent or honors research requires a minimum two-semester commitment (one credit per semester).

Major-related requirements (12 hours):

Chemistry 111, 112, 113, 114; and Mathematics 161.

Courses that count in the Biology major quality point average (MQPA):

All courses with "BIOL" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Science Degree in Biology and General Science Secondary Education Certification—100 hours

Biology Core (17 hours):

Biology 101, 102, 233, 234, and 486.

Groups (18 hours):

Choose one course from *each* of the following groups, as well as additional courses from any group to reach a minimum of 18 hours. Your group course section must include a minimum of three 4-credit lab courses.

Group 1: Molecular Mechanisms and Physiology
Biology 301, 302, 322, 325, 334, 346, and 407.

Group 2: Vertebrate Systems
Biology 310, 313, 314, and 341.

Group 3: Natural History
Biology 305, 323, 326, and 409.

Group 4: Environmental and Ecological Diversity
Biology 320, 328, 331, 403, and 421.

Biology Electives (3 hours):

Choose three hours from any additional Biology offerings. See the College *Bulletin* for Biology offerings not listed above. Note: Independent or honors research requires a minimum two-semester commitment (one credit per semester).

Major-related requirements (22 hours):

Chemistry 111, 112, 113, 114; Geology 201; Mathematics 161; Astronomy 206 or 207; and Science 201 and/or Physics 121 (both are recommended, but Science 201 may *not* follow Physics 121).

Education requirements (40 hours):

Education 202*, 203, 204, 215, 317, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205

while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Biology and General Science Secondary Education Certification major quality point average (MQPA):
All courses with "BIOL" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Science Degree in Biology/Health—74 hours

Biology Core (17 hours):
Biology 101, 102, 233, 234, and 488.

Groups (21-22 hours):
Health Group 1: Biology 334, 341, 346, and 407.
Health Group 2: Complete two courses from Biology 310, 313, 314, 325, or 322.

Biology Electives (9-10 hours):
Choose nine to ten hours from any additional Biology offerings. See the College *Bulletin* for Biology offerings not listed above. Note: Independent or honors research requires a minimum two-semester commitment (one credit per semester).

Major-related requirements (26 hours):
Chemistry 111, 112, 113, 114, 241; Mathematics 161; Physics 121; Psychology 201; and one of Psychology 101 or Sociology 101.

Courses that count in the Biology/Health major quality point average (MQPA):
All courses with "BIOL" prefix. A minimum MQPA of 2.00 is required to graduate.

This major is designed for those students interested in careers in medicine or allied health fields, including medical doctor, doctor of osteopathy, physical therapy, physician's assistant, nursing, veterinary medicine, optometry, dentistry, and others, while retaining strong general biology training. This major requires courses that are prerequisites for many allied health graduate programs.

Course Requirements for Bachelor of Science Degree in Conservation Biology—71 hours

Biology Core (17 hours):
Biology 101, 102, 233, 234, and 488.

Groups (28-29 hours):
Conservation Group 1: Biology 305, 320, 326, 328, and 331.
Conservation Group 2: Complete three courses from Biology 323, 403, 409, or 421.

Biology Electives (13-14 hours):
Choose thirteen to fourteen hours from any additional Biology offerings. See the College *Bulletin* for Biology offerings not listed above. Note: Independent or honors research requires a minimum two-semester commitment (one credit per semester).

Major-related requirements (12 hours):
Chemistry 111, 112, 113, 114; and Mathematics 161.

Courses that count in the Degree in Conservation Biology major quality point average (MQPA):
All courses with "BIOL" prefix. A minimum MQPA of 2.00 is required to graduate.

This major is designed to serve those students interested in careers in wildlife and natural resource management, or graduate study in the ecological, environmental, organismal or science fields, and others. This major requires courses that are prerequisites

for many environmental, conservation biology, resource management, or other field-oriented career paths.

Course Requirements for Bachelor of Science Degree in Molecular Biology—71 hours

Biology Core (17 hours):

Biology 101, 102, 233, 234, and 488.

Groups (15 hours):

Molecular Group 1: Biology 301, 302, and 407.

Molecular Group 2: Biology 314, 325, or 322.

Biology Electives (11 hours):

Choose eleven hours from any additional Biology offerings. See the College *Bulletin* for Biology offerings not listed above. Note: Independent or honors research requires a minimum two-semester commitment (one credit per semester).

Major-related requirements (28 hours):

Chemistry 111, 112, 113, 114, 241, 242, 351, and 352; and Mathematics 161.

Courses that count in the Molecular Biology major quality point average (MQPA):

All courses with "BIOL" prefix. A minimum MQPA of 2.00 is required to graduate.

This major is designed to serve those students interested in careers in biochemical, molecular, genetic, or cellular biology fields. This major requires courses that are prerequisites for many graduate programs in biochemistry, molecular biology, and related graduate programs.

Course Requirements for a minor in Biology (22 hours)

A minor in Biology will consist of Biology 101, 102, 233, 234; and six hours from Biology 301, 302, 305, 308, 310, 313, 314, 320, 322, 323, 325, 326, 327, 331, 334, 341, 346, 372, 390, 403, 407, 409, or 421.

The Biology curriculum seeks to develop academic competency and professional awareness, to encourage meaningful integration between the biological sciences and other dimensions of life, and to promote lifelong learning skills in problem solving, research, and communication. Writing-intensive, speaking-intensive, and information literacy skills are developed by special assignments in core and seminar courses.

Departmental policy limits students to one major within the Department of Biology. Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

BIOLOGY (BIOL)

BIOL 101. GENERAL BIOLOGY I. The first course in a year-long introduction to the unifying principles of biology. This semester includes discussion of the chemistry of life, cells structure, energy, genetics, and physiology. Three lectures and one lab per week. *Fall semester only, four hours.*

BIOL 102. GENERAL BIOLOGY II. A continuing discussion of the unifying principles of biology. Topics presented include: the diversity of life, kingdom plantae, animal reproduction and behavior, evolution, and ecological interactions. Three lectures and one lab per week.

Spring semester only, four hours.

BIOL 180. INTRODUCTION TO BIOLOGY (NON-HEALTH). This course is designed to prepare freshman, biology (non-health) students for their careers. Students will develop a professional portfolio, explore career options with their degree, learn about the importance of internships, discuss

memberships in professional organizations and ways to optimize attendance at professional meetings/conferences. Furthermore, students will learn about ways to balance their spiritual and professional life. Prerequisites: Biology 101; and freshman status or permission from instructor.
Spring semester only, one hour.

BIOL 190. STUDIES IN BIOLOGY. Intensive examination of an area of biology not fully covered by regular departmental offerings. Subject matter varies each semester.
Semester course, one, two, three or four hours.

BIOL 207. GENERAL MICROBIOLOGY. This course will provide students with the basic concepts and principles within the field of Microbiology, especially as they relate to microorganisms and viruses that cause disease. Topics include an introduction to the major classes of microorganisms and viruses, microbial nutrition and metabolism, the control of microbial growth, and innate and adaptive immunity. Special emphasis will be placed on a subset of medically important pathogens as a way of illustrating the importance of understanding microbial physiology and pathogenesis as well as the prevention and control of infection. The course is designed specifically for students who are interested in pursuing a career in nursing. Prerequisite: Nursing Program majors only.
Fall semester only, four hours.

BIOL 208. INTRODUCTION TO ENVIRONMENTAL EDUCATION. This course introduces the scope of environmental education. Topics addressed will include history and current trends, issue articulation and methodology, and development of problem-solving and communication skills to address environmental issues. Learning competencies K-12 will be emphasized and reinforced by environmental project-learning experiences. *Alternate years, fall semester only, two hours.*

BIOL 233. GENETICS. An exploration of modern genetics beginning with early 20th century classical concepts as they relate to cells, organisms, and populations, continuing through late 20th century genetics as the molecular basis for classical concepts, and concluding with 21st century techniques and concepts including genomics and proteomics. Three lectures and one recitation per week. Prerequisite: Biology 102. *Fall semester only, four hours.*

BIOL 234. CELL BIOLOGY. A focus on the organization and physiology of living cells using a problem-solving approach to learning. Topics will include transcription and translation, energy conversion, cell division, membranes, organelles, cytoskeleton, and cell communication among others. The lab provides core experience with model cellular systems and basic tools of biomolecular research. Three lectures and one lab per week. Prerequisite: Biology 233. *Spring semester only, four hours.*

BIOL 260. INDEPENDENT STUDY. Individual study of specialized topics in biology. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one to three hours.

BIOL 270. BIOLOGY RESEARCH. An opportunity to conduct supervised research in biology. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

BIOL 290. STUDIES IN BIOLOGY. Intensive examination of an area of biology not fully covered by regular departmental offerings. Subject matter varies each semester.
Semester course, one, two, three or four hours.

BIOL 301. MEDICAL GENETICS. This course focuses on the genetic causes of disease. A variety of diseases will be discussed, ranging from those caused by a single gene to very complex polygenic diseases. Furthermore, genetic testing will be covered, along with newly emerging therapeutic approaches to treating genetic diseases. The lab portion of the course will involve the use of current DNA-analysis techniques, as well as off-campus visits to clinical labs and lectures from practicing professionals. Three lecture hours and one lab per week. Prerequisites: Biology 233 and 234.
Fall semester only, four hours.

BIOL 302. DEVELOPMENTAL BIOLOGY. Investigates major events in embryonic development in animals including fertilization, cleavage, axis specification, gastrulation, neurulation, and organogenesis. Classical and modern developmental techniques and experiments will be discussed. Labs emphasize embryonic manipulation using multiple model organisms in designed lab projects. Three lectures and one lab per week. Prerequisite: Biology 234.
Alternate years, spring semester only, four hours.

BIOL 305. PLANT TAXONOMY. A study of plants in relation to their habitats, including aspects of plant geography and taxonomy in the lecture portion and methods of plant identification, collection, and preservation with emphasis on local flora in the lab portion. Three lectures and one lab per week. Prerequisite: Biology 234. *Fall semester only, four hours.*

BIOL 308. NEUROBIOLOGY. An investigation of a broad array of topics in neurobiology, building on foundations of the Hodgkin-Huxley model of action potential, synaptic transmission, and neuromodulation. Studies include processing of sensory information in visual and auditory systems, the chemical senses, and others. The connections between sensory integration and motor behaviors in diverse animals will be explored. Neural mechanisms of learning and memory, sleep/wakefulness, and reward and decision-making also will be addressed. Recommended for students considering a career in research, health sciences, or psychology. Prerequisite: Biology 234.
Offered periodically, semester course, three hours.

BIOL 310. ZOONOTIC DISEASE AND PUBLIC HEALTH. This course offers a unique opportunity to explore the pathological relationships that affect the health of animals and man within the global community. General virology, bacteriology, parasitology, and mycology will be discussed with special focus on the history, ecology, pathology, and epidemiology of specific zoonotic diseases of current importance. Preventative medicine, population and global health, and "One-Health" concepts will be discussed. This course has special and timely importance in preparation for all pre-health professional careers. Laboratory sessions may include field trips to local areas of public health interest as well as guest speakers from the community. Three lectures and one lab per week. Prerequisite: Biology 234. *Spring semester only, four hours.*

BIOL 313. HISTOLOGY. This course offers a focused study of the normal tissues of mammals from both a morphological and a functional view at a microscopic level. Selected common tissue pathologies will also be introduced, discussed, and observed. Each student gets experience in the preparation of fresh slides, as well as identifying all major body tissues under the light microscope and utilizing virtual technology. Prerequisite: Biology 234. *Fall semester only, three hours.*

BIOL 314. IMMUNOLOGY. An exploration of the mammalian immune system on a cellular and molecular level. Beginning with a broad overview of concepts in immunology, the course will explore in detail topics including pattern recognition, clonal selection and deletion, immunological recognition at the molecular level, and lymphocyte development. Lectures are supplemented with three-dimensional molecular modeling assignments. Special topics include the etiology of autoimmune disease and immunoevasive strategies employed by pathogens. Prerequisite: Biology 234.
Summer online only, three hours.

BIOL 320. CONSERVATION AND WILDLIFE BIOLOGY. A comparative study of representative vertebrates with emphasis on population dynamics, biodiversity, morphological adaptation, wildlife conservation, and resource management. The lab involves field identifications, aging, and morphological adaptations of representative vertebrates. Three lectures and one lab per week. Prerequisite: Biology 102. *Spring semester only, four hours.*

BIOL 322. THE BIOLOGY OF CANCER. This course focuses on the causes of cancer and progression of the disease. The common features of all cancers will be discussed in addition to the distinguishing characteristics of a subset of cancers. Throughout the course, therapeutic targets will be identified, and novel therapeutic approaches will be considered. Prerequisite: Biology 234.
Spring semester only, three hours.

BIOL 323. INVERTEBRATE ZOOLOGY. This course will provide students with a comprehensive presentation to the major invertebrate phyla through a combination of lectures and workshops. But because invertebrates comprise roughly 97% of animal species on the planet, we will emphasize terrestrial invertebrates, especially live ones locally available. Prerequisite: Biology 234.
Alternate years, fall semester only, three hours.

BIOL 325. VIROLOGY. An exploration of the theoretical and experimental basis of virology, with emphasis on mechanisms of virus replication, similarities and differences among virus groups including medically important viruses, how viruses ensure their own survival, and virus-host interactions including disease and host defenses. Two lectures per week. Prerequisite: Biology 234
Alternate years, fall semester only, three hours.

BIOL 326. EVOLUTIONARY BIOLOGY. The objectives of this course are to introduce students to the theory of evolution, from the production and maintenance of genetic variation to the formation of new species, to present a summary of the history of life on earth, to familiarize students with the mechanisms of evolution, and the concepts of speciation and of major innovations. The material explanation for the origins of life and biological diversification will be examined in light of the Biblical doctrine of God's sovereignty in creation and process. Prerequisite: Biology 234 or permission of instructor. *Spring semester only, three hours.*

BIOL 327. ESSENTIAL LITERATURE FOR BIOLOGISTS. This course is designed to introduce students to the seminal works that serve as the foundation for the broad sub-fields of biology. Students will read twelve to fourteen books (or excerpts from books) and critique those works in terms of their contribution to both modern biology and contemporary society. Prerequisite: Biology 101 and 102; or permission of instructor. *Intersession course; periodically during regular semesters, three hours.*

BIOL 328. FOUNDATIONS OF GEOGRAPHIC INFORMATION SCIENCE. This course offers an introduction into geographic information science (GIS). The course will focus on the foundational elements of spatial data analysis with students learning and applying essential mapping skills within the ArcGIS® software, specifically demonstrating the ability to acquire, manage, and analyze spatial data. The course will meet three times a week and consist of both lecture and in-class software analysis. Prerequisite: Biology 102. *Fall semester only, four hours.*

BIOL 331. ECOLOGY. A study of responses of living systems to a changing environment in relation to selected ecosystems with emphasis on the interrelations of individual, population, community, and habitat. Three lectures and one lab per week. Prerequisite: Biology 234.
Fall semester only, four hours.

BIOL 334. BIOCHEMISTRY FOR BIOLOGY. This course covers all the major principles in the field of biochemistry. Proteins, lipids, carbohydrates, and nucleic acids are studied within the themes of macromolecule structure & function, metabolic pathways, and gene expression. Specific topics include oxygen binding proteins, enzyme catalysis, membrane transport, synthesis/degradation pathways of carbohydrates, lipids, & amino acids, and the informational pathways of DNA replication, transcription, & translation. Prerequisites: Biology 101, 102, and Chemistry 241. *No credit will be given to students who have already received credit for Chemistry 351 or 352.* Biology 334 does not fulfill the biochemistry requirement for Biochemistry majors. *Spring semester only, three hours.*

BIOL 341. HUMAN/MAMMALIAN ANATOMY. Gross and microscopic anatomy of mammals will be explored with emphasis on humans. These holistic studies of the body will include 11 major systems: integumentary, skeletal, muscular, circulatory, respiratory, renal, digestive, reproductive, neurologic, endocrine, and lymphatic. This course illustrates normal form and function principles and has special importance in preparation of the health-related careers. Three lectures and one lab per week. Prerequisite: Biology 234. *Fall semester only, four hours.*

BIOL 346. HUMAN/MAMMALIAN PHYSIOLOGY. A study of the cellular basis for vertebrate organ system function with emphasis on human physiology. Systems discussed include muscle, nervous, endocrine, reproductive, urinary, digestive and cardiopulmonary. Laboratory exercises will

utilize physiology simulations, problem sets and hands-on investigation. Three lectures and one lab per week. Prerequisite: Biology 234. *Spring semester only, four hours.*

BIOL 360. INDEPENDENT STUDY. An opportunity for individual study of specialized topics in the biological sciences. Prerequisite: Completion of at least eight credits in biology, permission of the department chair, and a faculty sponsor. *Semester course, one to three hours.*

BIOL 370. INDEPENDENT RESEARCH. Course providing independent opportunity in biological research under the supervision of a faculty mentor. Prerequisites: Completion of at least eight credits in biology, permission of the department chair, and a faculty sponsor.
Semester course, one, two or three hours.

BIOL 372. CONTEMPORARY TOPICS. This course presents an opportunity for students to study a topic of particular interest to the faculty member offering the course. Heavy focus will be placed on reading primary literature, understanding the history of the field and discussing specific experiments and techniques which led to major findings in the field. Prerequisite: Biology 234.
Offered periodically, one hour.

BIOL 390. STUDIES IN BIOLOGY. Intensive examination of an area of biology not fully covered by regular departmental offerings. Subject matter varies each semester.
Semester course, one, two, three or four hours.

BIOL 403. BASIS OF WILDLIFE BEHAVIOR. A comparative study of the physiological and ecological basis of animal behaviors and its interaction in the ecology and management of wildlife populations. Emphasis is placed on the innate and learned behaviors in disease transmission, and in the evolution and management of rural and urban wildlife populations. Prerequisite: Biology 234.
Alternate years, fall semester only, three hours.

BIOL 407. MICROBIOLOGY. An introduction to microorganisms, primarily bacteria that cause disease in humans, which focuses on microbial structures, genetics, and life cycles, and also delves into molecular pathogenesis mechanisms and interactions between pathogens and the mammalian immune system. Two lectures and two labs per week. Prerequisites: Biology 234 and Chemistry 111 and 113. *Fall semester only, four hours.*

BIOL 409. ENTOMOLOGY. A study of the class Insecta, including insect diversity, life histories, morphology, physiology, behavior, ecology, and impact on human society. The course includes a combination of lecture and lab components. The lab component includes field excursions for collecting insects for display and anatomical/taxonomic investigation. Course traditions include a black-light party and a bug feast. Three lectures and one lab per week. Prerequisite: Biology 234.
Alternate years, fall semester only, four hours.

BIOL 421. AQUATIC AND FISHERY BIOLOGY. A study of freshwater and marine ecosystems, including the impact of pollution on aquatic environments, water chemistry, taxonomy of aquatic organisms, fisheries, and management of aquatic systems. Prerequisite: Biology 234.
Alternate years, fall semester only, three hours.

BIOL 460. INDEPENDENT STUDY. An opportunity for individual study of specialized topics in the biological sciences. Prerequisites: Completion of at least eight credits in biology, permission of the department chair, and a faculty sponsor. *Semester course, one to three hours.*

BIOL 470. INDEPENDENT RESEARCH. Course providing independent opportunity in biological research under the supervision of a faculty sponsor. Prerequisites: Completion of at least eight credits in biology, permission of the department chair, and a faculty sponsor.
Semester course, one, two or three hours.

BIOL 480. INTERNSHIP IN BIOLOGY. Qualified upperclassmen may participate in unpaid, individual off-campus experiences in research, medical, environmental, or other approved settings

under the guidance of both an on-site host supervisor and a Biology faculty sponsor. Grade is dependent upon required update communication with the faculty sponsor, written evaluation by the on-site supervisor, and submission of an internship paper to the faculty sponsor. Prerequisites: Minimum rising sophomore status, minimum 8 credit hours of biology, and permission of the department. *Summer or semester course, one to six hours.*

BIOL 486. SEMINAR FOR BIOLOGY TEACHERS. Provides instruction in how to prepare for and conduct effective biology learning experiences. Students will instruct classmates through presentations, participate in Project WET training, and conduct research using library/web resources. Students will also practice instruction in an actual classroom or informal setting. This course fulfills the Writing Intensive (WI), Information Literacy (IL), and Speaking Intensive (SI) requirements for education majors in the Department of Biology. Prerequisites: Junior or senior standing education majors and acceptance into a teacher certification program; or permission of instructor.
Spring semester only, one hour.

BIOL 488. SEMINAR IN BIOLOGY. Required of all majors in the Department of Biology except for those in teacher certification programs. Students will apply the knowledge they have obtained in previous biology classes by writing a literature review on a biological topic of their interest. Students will learn how to perform in-depth research of scientific literature through the use of library/web resources and will gain experience in both reading and critically evaluating peer-reviewed journal articles. Special emphasis will be placed on the students' participation in a peer-review process as they evaluate their peers' papers. The class culminates with each student delivering a professional oral presentation about their chosen topic. This course fulfills the Writing Intensive (WI), Information Literacy (IL), and Speaking Intensive (SI) requirements for majors in the Department of Biology. Prerequisite: Senior standing. *Semester course, one hour.*

BIOL 499. HONORS IN BIOLOGICAL RESEARCH. Seniors who have shown special aptitude in biology may undertake supervised biological research. Registration for the honors course requires prior completion of an on- or off-campus research experience. A research paper is required, and a public presentation is encouraged. Prerequisite: Senior standing, permission of the department chair, and a faculty sponsor. *Semester course, one hour.*

GEOLOGY (GEOL)

GEOL 201. PHYSICAL/ ENVIRONMENTAL GEOLOGY. A study of the internal and external forces affecting the surface of earth and the distribution of geologic resources and the environmental impacts on the extraction and use of these resources. This course is also designed to relate the historical and current geologic activity to the local ecology and land use planning.
Alternate years, spring semester only, three hours.

BUSINESS PROGRAM: DEPARTMENT OF ACCOUNTING AND FINANCE

Mrs. Stone, Chair; Dr. Grimm, Dr. McFeaters, Ms. Shultz, Dr. O. Zhang. Additional Instructional Faculty: Mr. Davidek, Mrs. DiDonato, Mr. Natali.

The mission of the business program at Grove City College is to prepare our students to become effective and ethical leaders in business as well as in society as a whole. This mission incorporates the following learning outcomes:

1. Business Knowledge and Analytical Skills: Our students will demonstrate the entry level knowledge and analytical skills necessary in their professional field.
2. Communication Skills: Our students will demonstrate the written and verbal skills needed to communicate effectively within the business environment.

3. Ethics: Our students will demonstrate a Christian understanding of business which reflects its moral and ethical responsibilities to all potential stakeholders.
4. Global Perspective: Our students will demonstrate an understanding of the global and multi-cultural issues in the current business environment.
5. Accounting Knowledge and Skills: Our students will demonstrate the ability to prepare and analyze financial information used in managerial decision-making and external reporting for publicly- and privately- held business organizations, governmental entities, and non-profit organizations. Our students will demonstrate an understanding of accounting systems and their related internal controls and will demonstrate the ability to prepare and to audit financial statements that are generated from these accounting systems. Our students will demonstrate the ability to apply federal tax law in the preparation of individual tax returns. Our students will engage with the coursework needed to prepare for professional certification exams.
6. Finance Knowledge and Skills: Our students will demonstrate knowledge and skills that meet or exceed requirements to compete for entry-level positions in a variety of settings, including corporate finance and the financial services industry. This includes knowledge of finance principles, investments, and advanced topics in corporate finance. Our students will engage with the coursework needed to prepare for professional certification exams.

The ACBSP accredited Accounting and Finance majors prepare students for entry-level careers in all arenas of accounting and finance, including public accounting; corporate, partnership, or sole proprietorship accounting; governmental and NGO accounting; corporate finance; financial services; and various positions in the non-profit sector, including areas such as education and health care.

Course Requirements for a Bachelor of Science Degree in Accounting—70 hours

Accounting Core (30 hours):

Accounting 201-202, 301-302, 303, 321, 401, 402, 403, and 405.

Business Core (21 hours):

Management 103, 201, 214, 303, 486; Marketing 104; and Finance 301.

Major Electives (9 hours)

Choose nine additional hours from any 200-, 300-, or 400-level courses in Accounting, Entrepreneurship, Finance, International Business, Management, or Marketing (maximum of 3 hours of internship credit toward the 70 hours for the B.S. degree). Students pursuing their CPA license should consider taking Accounting 404, Accounting 406, and/or Accounting 410. (Please see additional information later in this section under "CPA Licensing Requirements".)

Major-related courses (10 hours):

Mathematics 141 or 161*; Economics 101 and 102.

** Mathematics 141 prepares students in the business applications of calculus, but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.*

Courses that count in the Accounting major quality point average (MQPA):

All courses with "ACCT", "FNCE", "INBS", "MARK", "MNGT" prefix, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate. A maximum

of three accounting (ACCT) courses may be taken in any one semester unless approval is obtained by department chair and faculty advisor.

It is recommended that students planning to enter the field of public accounting take additional accounting courses to satisfy their major electives.

Course Requirements for a Bachelor of Science Degree in Finance—67 hours

Business Core Courses (33 hours):

Accounting 201, 202; Finance 301; International Business 205; Management 103, 110, 201, 214, 303, 486; and Marketing 104.

Math/Economics Courses (10 hours):

Economics 101, 102; Mathematics 141 or 161*.

**Mathematics 141 prepares students in the business applications of calculus, but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.*

Finance Major Core Courses (12 hours):

Finance 332, 341, 436, and 440.

Finance Major Elective Courses (12 hours):

Choose twelve additional hours from any 200-, 300-, or 400-level courses in Accounting, Economics, Entrepreneurship, Finance, International Business, Management, or Marketing. A minimum of six hours must be Finance, excluding 460 and 480. A maximum of three hours of internship may count as finance electives; any remaining internship credits will count as general electives.

Courses that count in the Finance major quality point average (MQPA):

All courses with "ACCT", "ENTR", "FNCE", "INBS", "MARK", and "MNGT" prefix, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

Students who graduate with a major in finance receive comprehensive training in business, along with specialized instruction in corporate finance and investment management. Advanced level courses in capital markets, financial planning and valuation provide the student with career-specific training. Students learn practical applications from research projects, simulations, and Harvard-style case studies.

Writing, Speaking and Information Literacy Intensive Courses

It is essential for students majoring in the Department of Accounting and Finance to possess strong writing, speaking, and information literacy (knowing how to locate, analyze, and use information in decision-making) skills in preparation for careers in accounting and finance and/or graduate studies. The curriculum requirements specifically designed to develop these skills include Management 214 *Business, Ethics, and Society* and Management 486 *Business Policy and Strategy*. Please see course descriptions that follow for more information.

CPA Licensing Requirements: 150-Credit Hour, 4-Year Double Majors:

The Department of Accounting and Finance offers two programs, one leading to a 150-credit hour double major in Accounting and Finance and the second leading to a 150-credit hour double major in Accounting and Business Analysis. Both programs, which satisfies the CPA licensing requirements of the Commonwealth of Pennsylvania as well as most other states, are designed, through summer, intersession, and/or winter term coursework, to be completed in four years. Students entering Grove City College as freshmen with

Advanced Placement (AP) credits or other college credits will find this program particularly of interest.

The traditional 128-credit hour Accounting major is available as a degree option and it is the foundation of the 150-hour double majors. In addition to completing requirements for the Accounting major as outlined on the previous page, students choosing a double major option will also need to satisfy the following requirements:

- Accounting-Finance Dual Major
  - Finance 332, 341, 436, and 440; International Business 205; and Management 110 (18 hours).
- Accounting-Business Analysis Dual Major
  - Computer Science 141, 220, 244; International Business 205; Management 202, 204, 307, and 310 (24 hours). Students pursing the CPA are also recommended to complete Accounting 404, 406, or 410.

Students interested in this dual major program will be on record with Accounting as their first major and either Finance or Business Analysis as their second major. Students may enter Grove City College declaring the double major or may add the second major after matriculation. Please contact the Accounting and Finance Department Chair for more information.

Students who are interested in obtaining 150 credit hours to meet CPA licensing requirements are not limited to these double major programs. Students may select any courses they choose to make up the additional credits beyond 128 hours. Popular options include the Forensic Accounting concentration (discussed below), double majoring in another Business Program major, double majoring in another College program, and or minoring in any number of areas across the College programs.

Course Requirements for a concentration in Forensic Accounting (15 hours)

Students majoring in Accounting can earn a concentration in Forensic Accounting by completing Accounting 305 and 404; Sociology 221; Communication Arts 303; and either Management 304 or 325. Note: Accounting 305, 404, and either Management 304 or 325 satisfy the nine credits of major electives required for the Accounting major.

Course Requirements for a minor in Accounting (18 hours)

(Restricted to non-Accounting majors only)

A minor in Accounting will consist of Accounting 201, 202, 301, 321, 405, and one course from Accounting 302, 303, 305, 401, 402, 403, or 406.

Course Requirements for a minor in Finance (18 hours)

(Restricted to non-Finance majors only)

A minor in Finance shall consist of Finance 301, 332, 440, and three courses from Finance 334, 341, 435, 436, 462, or Entrepreneurship 430.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ACCOUNTING (ACCT)

ACCT 201. PRINCIPLES OF ACCOUNTING I. This introductory course focuses on the preparation and use of accounting information in the financial reporting environment. Emphasis is placed on the understanding and application of steps involved in the accounting cycle as well as on the recognition, measurement, and reporting issues associated with various financial statement accounts for sole proprietorships and partnerships using the accrual basis of accounting. The course also exposes the student to career opportunities in the accounting profession. *Fall semester only, three hours.*

ACCT 202. PRINCIPLES OF ACCOUNTING II. Course topics include accounting for debt and stockholder's equity, financial statement analysis, statement of cash flows, as well as introductions to managerial accounting techniques including cost-volume-profit analysis, budgeting, product costing, standard costs, and decision-making analysis. Prerequisite: Accounting 201.
Spring semester only, three hours.

ACCT 260. INDEPENDENT STUDY. Individual study of specialized topics in accounting. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ACCT 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in accounting. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 301. INTERMEDIATE ACCOUNTING I. A study of the financial statements with an emphasis on the income statement and asset section of the balance sheet. This course also focuses on accounting theory, the interpretation of financial accounting standards associated with the balance sheet, and International Financial Reporting Standards [IFRS]. Prerequisite: Accounting 202.
Fall semester only, three hours plus lab.

ACCT 302. INTERMEDIATE ACCOUNTING II. A continued study of the financial statements with an emphasis on the liabilities and stockholder's equity sections of the balance sheet. Includes topics such as earnings per share (EPS), accounting for income taxes, leases, and pensions, and the statement of cash flows. This course also focuses on accounting theory and the interpretation of current financial accounting standards, including IFRS. Prerequisite: Accounting 301.
Spring semester only, three hours plus lab.

ACCT 303. COST ACCOUNTING. A study of cost flows in a manufacturing environment and the assignment of direct and indirect manufacturing costs to a company's cost of goods sold and inventory accounts by the application of job order, process, and standard costing systems. The course also focuses on the ways in which accounting information is used in operational decision-making. Prerequisite: Accounting 202. *Fall semester only, three hours.*

ACCT 305. FORENSIC ACCOUNTING. This course is intended to provide students with an introductory exposure to the field of forensic accounting. Much broader than fraud auditing, forensic accounting involves the use of intelligence-gathering techniques, along with other accounting and business skills, to present trial testimony and to develop information and opinions for use by attorneys in litigation. Specific topics include the roles and responsibilities of the forensic accountant, fraud standards and different types of fraud, ethical considerations, internal controls, business valuation, breach of contract, and damage calculations. Prerequisites: Accounting 202 and junior standing.
Alternate years, fall semester only, three hours.

ACCT 321. ACCOUNTING INFORMATION SYSTEMS. A study of the use of a variety of resources designed to transform financial and other data into financial information for decision-making. Consideration of these systems must deal with issues such as the flow of transactions and related procedures; summarizing the financial data into meaningful formats for both internal and external reporting; documentation for audit trail purposes; data security and backup; and disaster recovery planning. The course will emphasize transaction cycles, business processes, systems controls, and accounting database applications. Prerequisites: Accounting 202.
Spring semester only, three hours.

ACCT 360. INDEPENDENT STUDY. Individual study of specialized topics in accounting. Prerequisites: Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ACCT 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in accounting. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 390. STUDIES IN ACCOUNTING. Studies in areas of accounting not fully covered by regular departmental offerings. *Semester course, three hours.*

ACCT 401. ADVANCED ACCOUNTING I. A study of the financial accounting effects on business entities involved in mergers, consolidations, and divestitures with an emphasis on the proper recognition and recording of acquisition, the elimination of inter-company transactions, and the preparation of consolidated financial statements. Prerequisite: Accounting 302. *Fall semester only, three hours.*

ACCT 402. ADVANCED ACCOUNTING II. A study of the financial accounting principles used in the preparation of general-purpose financial statements for governmental units, not-for-profit corporations and associations including colleges and universities, health care entities, voluntary health and welfare organizations, and partnerships. Foreign exchange transactions and other special topics are also covered. Prerequisite: Accounting 302. *Spring semester only, three hours.*

ACCT 403. AUDITING. A study of the duties and responsibilities of professional auditing, including types of audits and audit programs, audit planning, evidence, risk assessment, preparation of audit working papers, and audit reports. Prerequisites: Accounting 302, 321, and senior standing. *Fall semester only, three hours.*

ACCT 404. ADVANCED AUDITING. Additional auditing issues are explored, including practical applications involving statistical sampling, IT controls, risk assessment, and audit evidence gathering. Legal issues in auditing and other types of non-attest services are also discussed. Prerequisites: Accounting 403 and senior standing. *Spring semester only, three hours.*

ACCT 405. TAX ACCOUNTING. A study of the provisions of the federal tax laws and the proper practices in preparing tax reports with emphasis on tax preparation for individuals. Prerequisites: Accounting 202 and senior standing. *Fall semester only, three hours.*

ACCT 406. ADVANCED TAX ACCOUNTING. Theory and practice in the treatment of partnership and corporate taxes with emphasis on the accounting and management planning aspects. Prerequisites: Accounting 405 and senior standing. *Spring semester only, three hours.*

ACCT 410. CONTEMPORARY ACCOUNTING THEORY AND PRACTICE. A capstone course that stresses contemporary financial accounting issues and theory and that familiarizes the student with interpretation of current accounting standards. Other non-financial topics are briefly covered. Prerequisites: Accounting 302 and senior standing. *Spring semester only, three hours.*

ACCT 460. INDEPENDENT STUDY. Individual study of specialized topics in accounting. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in accounting. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ACCT 480. INTERNSHIP IN ACCOUNTING. This is an opportunity for accounting majors to participate in a meaningful learning experience under the supervision of both an employer and department faculty member. Most internships take place during the summer months. Students will be graded based on an employer performance evaluation along with a written paper and journal. Prerequisites: Good academic standing and completion of the freshman year of study. *One to six hours.*

FINANCE (FNCE)

FNCE 105. PERSONAL FINANCE. An introduction to the complexities of personal financial planning, such as managing personal debt (including educational debt); choosing health, life, and property insurance; making investments; and understanding income taxation, retirement, and estate planning. It provides a broad overview of important personal financial management tools and is geared towards students of all majors. (This course does not count towards the Accounting or Finance major requirements.) *Semester course, three hours.*

FNCE 301. PRINCIPLES OF FINANCE. This course explains important concepts and applications in corporate finance, such as time value of money, security valuation, capital budgeting, portfolio theory, and capital structure. This is a mathematics intensive course designed to develop analytical thinking skills. Prerequisites: Accounting 201 and Management 201. This course is the key building block for upper-level finance courses; as such, Finance majors should complete the course by the end of the sophomore year. Additionally, it is a building block for ACCT 302, and Accounting majors should complete the course by the end of the first semester of sophomore year.
Semester course, three hours.

FNCE 332. INVESTMENTS. This course examines a variety of topics commonly associated with investment in publicly traded securities and mutual funds. It examines ways in which financial market data is utilized as inputs into models for asset pricing and portfolio management. It also explores topics such as index construction, portfolio performance assessment, and risk management techniques using derivatives. Prerequisites: Finance 301 and junior standing. *Fall semester only, three hours.*

FNCE 334. INVESTMENT VALUATION. This course covers techniques used to assess the investment merit of publicly traded debt and equity instruments. The course focuses on various applications of fundamental and technical analysis. Students will use these techniques to construct research reports and investment recommendations. They will also provide a presentation based upon the results of their analysis. Prerequisites: Finance 301 and 332. *Spring semester only, three hours.*

FNCE 341. FINANCIAL MODELING. This course equips students with knowledge of fundamental financial models and ability to apply them using Excel. Such models cover time value of money and stock valuation, portfolio management, option pricing, and bond pricing. After this course, students are expected to use these models using Excel to solve financial problems in these areas. Prerequisites: Finance 301 and 332. *Spring semester only, three hours.*

FNCE 435. FINANCIAL PLANNING. This course provides a comprehensive exploration of financial planning topics (in conjunction with the recommendation of the Academy of Financial Services and the CFP Board of Standards) including the financial planning process, client interactions, time value of money applications, personal financial statements, cash flow and debt management, asset acquisition, education planning, risk management, investment planning, retirement planning, special circumstances, plan integration, ethics, and the business of financial planning. Prerequisites: Finance 301 and junior standing. *Spring semester only, three hours.*

FNCE 436. CAPITAL MARKETS. This course explores the functions and operations of money, capital, and derivatives markets. It addresses topics such as stock market efficiency, financial market integration and globalization, as well as markets for venture and private capital. The characteristics of various financial instruments that trade over-the-counter and on organized exchanges will also be reviewed. Prerequisite: Finance 301. *Spring semester only, three hours.*

FNCE 440. ADVANCED CORPORATE FINANCE. This course focuses on the processes and procedures employed by financial managers to help ensure that actions taken enhance shareholder value. Topics include applications of net present value and options pricing models to capital budgeting decisions, techniques for determining the cost of capital, valuation and performance measurement, mergers and acquisitions, and risk analysis and management. This course will emphasize the use of spreadsheets for model building and analysis. Prerequisite: Finance 301.
Fall semester only, three hours.

FNCE 462. INTERNATIONAL FINANCE. Knowledge of international finance is essential as markets become increasingly globalized. This course focuses on financial issues faced by both multinational corporate financial managers and individual investors with a global perspective. Among these issues covered are foreign currency exchange, cultural and regulatory differences between countries, international balance of payments, and international financial markets. Prerequisites: Finance 301, International Business 205 (Global Business Issues), and one of the following: Finance 332, 334, or 440. *Fall semester only, three hours.*

FNCE 480. INTERNSHIP IN FINANCE. This is an opportunity for finance majors to participate in a meaningful learning experience under the supervision of both an employer and department faculty member. Most internships take place during the summer months. Students will be graded based on an employer performance evaluation along with a written paper and journal. Prerequisites: Good academic standing and completion of the freshman year of study. *One to six hours.*

BUSINESS PROGRAM: DEPARTMENT OF ENTREPRENEURSHIP

Mr. Sweet, Chair; Ms. English, Mr. K. Smith. Additional Instructional Faculty: Mr. English, Mr. Lewis.

The mission of the Business Program at Grove City College is to prepare our students to become effective and ethical leaders in business as well as in society as a whole. This mission incorporates the following learning outcomes:

1. General Business Knowledge and Analytical Skills - Our students will demonstrate the entry-level knowledge, analytical skills, and information literacy generally necessary in business.
2. Communication Skills - Our students will demonstrate the written and verbal skills needed to communicate effectively within the business environment.
3. Ethics - Our students will demonstrate a Christian understanding of business which reflects their moral and ethical responsibilities to all potential stakeholders.
4. Global Perspective - Our students will demonstrate an understanding of the global and multi-cultural issues in the current business environment.
5. Entrepreneurship Knowledge and Skills - Our students will demonstrate entry-level knowledge and skills necessary to successfully plan, launch, and operate startup commercial and social enterprises, and to develop new business models in corporate contexts. Students will acquire experience and competencies in ideation, lean startup methodologies, competitive research, blended-value business modeling, digital technologies, business planning, and in the financial, legal, ethical and faith-minded dimensions of entrepreneurship.

Course Requirements for a Bachelor of Science Degree in Entrepreneurship—67 hours

Entrepreneurial Core (34 hours):

Entrepreneurship 101 and 102.

Entrepreneurship 201, 302, 303, 306, 307, 309, 312, 430, 466, and 467.

Business Core (15 hours):

Accounting 201 and 202; Finance 301; Management 201; and Marketing 104.

Entrepreneurial Electives (12 hours):

Complete 12 hours choosing from Entrepreneurship 104, 314, 317, 319, 324, 326, 328, 330, 331, 390, 402, 408, 409, 423, 424, 426, 468, 488, or any two courses from

any 300- or 400-level Accounting, Entrepreneurship, Finance, International Business, Management, or Marketing offerings not listed. A maximum of three credits of Entrepreneurship 480 Internship may also count as entrepreneurial electives; any remaining internship credits will count as general electives.

Major-Related Courses (6-7 hours):

Economics 101; and Computer Science 141, Mathematics 141, or Mathematics 161.

Courses that count in the Entrepreneurship major quality point average (MQPA):

All courses with "ACCT", "ENTR", "FNCE", "INBS", "MARK", "MNGT" prefix, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

It is essential for students pursuing the Entrepreneurship major to possess strong writing, speaking, and information literacy skills in preparation for future careers in business. Four required courses for the major will equip students with these skills: Entrepreneurship 466 *Business Planning* is designated to enhance Writing Intensive (WI) skills; Entrepreneurship 102 *Technology for the Entrepreneur* for Information Literacy (IL) skills; and Entrepreneurship 101 *The Entrepreneurial Mind: Creativity and Innovation* and Entrepreneurship 467 *Corporate Innovation* for Speaking Intensive (SI) skills.

Course Requirements for a minor in Entrepreneurship (22 hours)
(Restricted to non-Entrepreneurship majors only)

A minor in Entrepreneurship will consist of Accounting 201; Entrepreneurship 101, 102, 201; Finance 301; and nine hours from Entrepreneurship 302, 303, 307, 309 or 328, 312, 314, 317, 408, 423, 430, or 467.

Course Requirements for a minor in Digital Entrepreneurship (21 hours)
(Restricted to non-Entrepreneurship majors only)

A minor in Digital Entrepreneurship will consist of Entrepreneurship 101, 328, 330, 409; Design 101, 210: and one of Entrepreneurship 309 or Marketing 315.

Course Requirements for a minor in Redemptive Entrepreneurship (18 hours)
(Restricted to non-Biblical & Religious Studies, non-Christian Ministries, and non-Entrepreneurship majors only)

A minor in Redemptive Entrepreneurship will consist of Entrepreneurship 307, 314, 468, and three courses from Religion 248, 251, 320, Christian Ministries 228, and 248.

Course Requirements for a minor in Missional Entrepreneurship (18 hours)
(Restricted to Biblical & Religious Studies and Christian Ministries majors only)

A minor in Missional Entrepreneurship will consist of including Entrepreneurship 101, 201, 307, 314, 408, and 468.

Course Requirements for a minor in Social Enterprise (21 hours)
(Restricted to Business Program majors only)

A minor in Social Enterprise will consist of Entrepreneurship 307; Entrepreneurship 408 or International Business 408; Sociology 201, 356; Communication Arts 225 or Global Studies 300; and six hours from Sociology 208, 314; Social Work 101, 305, 382; or Entrepreneurship, Management, or Sociology 390 with department chair approval.

Course Requirements for a minor in Social Entrepreneurship (21 hours)
(Restricted to Sociology majors only)

A minor in Social Entrepreneurship will consist of Entrepreneurship 101, 307; Entrepreneurship 408 or International Business 408; Accounting 201; Finance 301; Management 103; and Marketing 104.

Course Requirements for a minor in Social Innovation (21 hours)
(Restricted to Entrepreneurship majors only)

A minor in Social Innovation will consist of Entrepreneurship 408 or International Business 408; Sociology 201, 356; Communication Arts 225 or Global Studies 300; and nine hours from Sociology 208, 314; Social Work 101, 305, 382; and Entrepreneurship, Management, or Sociology 390 with department chair approval.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ENTREPRENEURSHIP (ENTR)

ENTR 101. ENTREPRENEURIAL MIND: CREATIVITY AND INNOVATION. This course introduces the student to entrepreneurial thought and the process for innovation and idea generation. Students begin to develop their own entrepreneurial mindset and the business skills essential to the entrepreneurial experience. Students are introduced to the basics of business and challenged to think creatively about forming businesses or designing products to solve customer problems and address unmet needs in the commercial and social arenas. Through experiential learning, case studies, business writing assignments, and creative thinking exercises, students will develop a disciplined thought process for starting and running their own enterprise. This course satisfies the Speaking-Intensive requirement for Entrepreneurship majors. Corequisite: Entrepreneurship 102 for Entrepreneurship majors. All other majors may take the course as an elective without the corequisite.
Fall semester only, three hours.

ENTR 102. TECHNOLOGY FOR THE ENTREPRENEUR. Students learn to use technology commonly used by entrepreneurs in the following areas: presentations, networking, blogging, social media, design, basic websites, eCommerce, and prototyping. This course satisfies the Information Literacy requirement for Entrepreneurship majors. Entrepreneurship majors take this concurrently with Entrepreneurship 101. *Fall semester only, one hour.*

ENTR 104. LIFE DESIGN STUDIO. Students often struggle with knowing how to define their future. Whether one is trying to choose a major or to figure out how to go about pursuing a career using that chosen major, it's a process that's often filled with uncertainty and angst. By approaching these challenges as a designer would approach creating a product, students will use proven design methods to understand who they are, what they want to do, and how they can build a life full of joy. During this class, students will explore how to apply design thinking principles to their lives while learning more about themselves and how to connect their work to God's work.
Fall semester only, three hours.

ENTR 201. LEAN LAUNCHPAD. The Lean LaunchPad uses the Customer Discovery process and the Business Model Canvas to collapse the infinite possibilities of a startup into a set of solvable problems. Students will be taught how to use the information that they collect from customers to validate and/or invalidate their business model hypotheses. Throughout the course, the teams will modify their business models as they iterate, pivot, and/or restart their ideas. It provides real world, hands-on learning on what it's like to actually start a company. This class is not about how to write a business plan. It is a practical entrepreneurial lab in which the goal is to create an entrepreneurial experience that includes the pressures and demands of the real world in an early-stage startup within the constraints of the classroom and with a limited amount of time. Students will work in teams, learning how to use a business model to brainstorm and test each critical element of a company. Students will also learn how to develop customers in real business scenarios, testing product viability and authentic demand. *Spring semester only, three hours.*

ENTR 260. INDEPENDENT STUDY. Individual study of specialized topics in entrepreneurship. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ENTR 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in entrepreneurship. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENTR 302. SALES IN THE STARTUP. The purpose of this course is to understand the theory and practice of sales as it is approached in the environment of a startup business. The class will explore strategic selling methodologies, such as partnership development, channel development, and seminar-based sales, as well as specific sales skills and techniques. Students will learn about the particular challenges of selling in the context of a newly launched business, and they will have the opportunity to meet and interact with sales professionals who have specialized in this sales context. Throughout the course, students will have opportunities to practice sales skills. *Spring semester only, three hours.*

ENTR 303. LAW FOR ENTREPRENEURS. This course provides an awareness and basic understanding of the legal issues frequently encountered by entrepreneurs. The course specifically examines the legal issues surrounding the organization, financing, and operations of a company, including ownership structuring, the raising of capital, federal securities requirements and exemptions, determining valuation, intellectual property, board formation, human resources, and exit strategies. Students may not receive credit for both Entrepreneurship 303 and Management 303.
Spring semester only, three hours.

ENTR 306. ETHICS FOR THE ENTREPRENEUR. Students study the ethical decisions business professionals face in small business, family business, and corporate business settings. Students analyze selected case studies and discuss their analysis with the class. Students will interact with business professionals as they study and analyze "living" cases in which one or more of the parties interacts with the class. Through these discussions, students will come to understand what constitutes an ethical issue and the different philosophical, theological, and practical perspectives from which individuals may approach an ethical decision. Students are challenged to begin thinking through and developing their own ethical framework as well as to realize the implications of Christian faith in making ethical business decisions. *Fall semester only, three hours.*

ENTR 307. SOCIAL ENTREPRENEURSHIP. How might one "do good while doing well?" Social entrepreneurship is an accelerating field of study and practice in today's world of shrinking governmental services. Students study highly effective non-profit as well as for-profit social enterprises to learn the unique aspects of entrepreneurship used to facilitate meaningful social change. Practitioners of existing successful social enterprises act as guest lecturers and coaches.
Fall semester only, three hours.

ENTR 309. E-COMMERCE. This course will provide a foundation for understanding the essential components of a successful eCommerce system, including eCommerce strategy, target market analysis, search engine optimization, integrated marketing, web usability, payment processing, current technologies, data management and fulfillment systems. Case studies and actual business scenarios will be examined in detail, and students will have the opportunity to explore practical applications in the marketplace by working in teams to design and operate their own eCommerce ventures during the semester. *Fall semester only, three hours.*

ENTR 312. ENTREPRENEURSHIP: MANAGING A GROWING ENTERPRISE. This course focuses on the strategy and operations issues involved with managing an existing company beyond the startup phase using a global business simulation game. While the course is open to non-entrepreneurship, business, and accounting majors, it presupposes a basic understanding of business functions and language. The core feature of the course is a simulation tied to students' weekly business decisions involving recognizing opportunities, assessing risk, developing resources, and implementing a course of action. *Fall semester only, three hours.*

ENTR 314. ENTREPRENEURSHIP AND THE MISSION OF THE CHURCH. This course explores the relationship between entrepreneurial theory and practice and the execution of church ministry and mission work, with a particular focus on the ways in which entrepreneurship can be employed in the service of Kingdom of God. In addition, the development of "kingdom-minded" businesses providing blended value will be explored in detail. Students will learn about need identification, opportunity analysis, ministry model development, strategic planning, and reputation building in the context of faith-based organizational experience. Concepts related to organizational launch, growth, development and sustainability will also be addressed throughout the course. Students will apply diagnostic and problem-solving skills to case studies, while identifying entrepreneurial strategies to address challenges and opportunities. Students will work throughout the semester in project teams with a local church ministry or mission endeavor. *Spring semester only, three hours.*

ENTR 317. STARTUP FOUNDERS' DILEMMAS. The early decisions made by the founders of startup organizations can determine the entire future path of a company. In this course, students will explore the types of decisions that founders face and the potential impact of such decisions. They will examine case studies of actual startup companies in detail in order to understand how to avoid common pitfalls and mistakes. Through the examination of the results of a decade of research, including quantitative data on almost ten thousand founders, students will build a strong understanding of these types of decisions and how their consequences can make or break organizations. The specific areas of study will include pre-founding decisions, founding team dilemmas, hires, and investors.
Fall semester only, three hours.

ENTR 319. ENTREPRENEURIAL LEADERSHIP. This course will include a comprehensive survey of research around the dimensions of successful entrepreneurial leadership and the development of an entrepreneurial leadership assessment tool. Students will have opportunities to hear from, engage with, and assess several successful entrepreneurs, further developing their understanding of the dimensions of entrepreneurial leadership. Students will complete a comprehensive assessment of their own strengths and weaknesses relative to these dimensions using a variety of assessment tools and will prepare and present a personal entrepreneurial leadership development plan with specific strategies to leverage strengths and accommodate for shortcomings. *Fall semester only, three hours.*

ENTR 324. LEGAL ASPECTS OF THE MUSIC BUSINESS. This course is designed to analyze the most important legal issues in the contemporary music industry, including how these issues began, how they have evolved, and where they are headed. Students will explore copyright law, including fair use and public domain, and how it affects sampling, interpolation, and mashups. The course will explore contracts related to songwriting, 360° deals, revenue sharing, and more, in addition to legal documents related to bands, booking, and touring. Students will also explore contemporary and new means of creating and disseminating music, including streaming audio/video and augmented/virtual reality, and explore associated legal implications. Students may only receive credit for one of Entrepreneurship 324, Management 324, or Music 324. *Spring semester only, three hours.*

ENTR 326. INTRODUCTION TO THE BUSINESS OF MUSIC. This course is designed as an introduction to the business of music, providing students with the latest instruction on best practices for music creators, consumers, and facilitators working in this field. Students will have the opportunity to learn the fundamental principles involved in the entrepreneurial and legal dimensions of the music business, exploring the structural and functional components of this ever-changing and rapidly growing industry. Particular attention will be given to the challenges of starting, growing and managing a music business in the digital era. Students may only receive credit for one of Students may only receive credit for one of Entrepreneurship 326, Management 326, or Music 326. *Semester course, three hours.*

ENTR 328. CONTENT MARKETING. Students will probe the subject of content marketing as a core discipline for 21st century entrepreneurs. They will learn essential concepts for strategic content development and web-based thought leadership and will acquire skills for use with practical web applications. Students will engage in a semester-long project using WordPress to publish Internet content for their own website idea, or for a company or organization, employing techniques learned in a class. The structure of the class will include two teaching sessions per week and a WordPress lab. Students may not receive credit for both Entrepreneurship 328 and Marketing 328.
Fall semester only, three hours.

ENTR 330. SEARCH ENGINE OPTIMIZATION. Students will explore the fundamental principles and best practices in the field of search engine optimization. They will learn and develop the essential knowledge and skills required to achieve favorable organic rank in the most important search engines and will become familiar with and interact with experts in the industry. Case studies and actual business scenarios will be examined in detail. Students will have opportunity to conduct SEO research for small businesses and non-profit organizations in a semester-long project. Students may not receive credit for both Entrepreneurship 330 and Marketing 330. *Spring semester only, three hours.*

ENTR 331. ENTREPRENEURSHIP AND ENTERPRISE. An examination of entrepreneurship and its role in society. The contribution of creativity, foresight, and other attributes of entrepreneurs to the working of both for-profit and not-for profit enterprises will be explored.
Semester course, three hours.

ENTR 360. INDEPENDENT STUDY. Individual study of specialized topics in entrepreneurship. Prerequisites: Junior standing and permission of the department chair.
Semester course, one, two or three hours.

ENTR 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in entrepreneurship. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENTR 390. STUDIES IN ENTREPRENEURSHIP. Studies in areas of entrepreneurship not fully covered by regular departmental offerings. *Semester course, three hours.*

ENTR 402. TECH COMMERCIALIZATION STUDIO. In this course, students will examine what is needed to take an idea to market while exploring business and revenue models, legal considerations, customer validation, and go-to-market strategies through lectures, guest presentations, and working on exercises exploring the commercialization of a specific technology. *Spring semester only, 1 hour.*

ENTR 408. SOCIAL ENTREPRENEURSHIP PRACTICUM. Using case studies, lectures, and hands-on exercises, this course clarifies and illustrates the steps necessary to prepare to launch a social enterprise. Topics include the idea generation, business models, organizational structure, staffing, governance, funding, and measurement of social impact. Over the course of the semester, students will prepare business plans for their own social enterprises. Students may only receive credit for one of International Business 408 or Entrepreneurship 408. *Spring semester course, three hours.*

ENTR 409. DIGITAL ENTREPRENEURSHIP. This course will explore the foundational principles and essential components for launching a successful entrepreneurial endeavor on the Internet. The course will cover important topics related to Internet Entrepreneurship, including key entrepreneurial models, business concept development, opportunity analysis, advanced search marketing techniques, understanding user behavior, and creating a viable Internet model for business endeavors. Case studies and existing businesses will be examined in detail. Students will have the opportunity to study the journeys of successful Internet Entrepreneurs, to hear from experts in the field, and to create an original Internet business model in a team with other students.
Spring semester course, three hours.

ENTR 420. MENTORING. This course will help students learn and practice the skills necessary to establish and leverage valuable mentor relationships. The course consists of two dimensions:

classroom study and one-on-one discussions with an experienced business leader. Students learn how to identify, establish and work with a mentor, to develop professional networks, to build relationships, and to determine the purpose and value of relationships in the world of the entrepreneur. Students will be prepared for typical mentorship discussion topics, such as a personal value statement, strengths assessment, a personal development plan, ethical leadership, professionalism, meaningful internships/summer jobs and finding one's calling. The course, designed for junior and senior Entrepreneurship majors, is open to any upper-division non-majors pending space available. Prerequisite: permission of the instructor. *Semester course, three hours.*

ENTR 423. FAMILY, FRANCHISE, AND SMALL BUSINESS MANAGEMENT. An upper-level course that will focus on the dynamics of owning and operating family-owned businesses, franchise businesses and acquired small businesses. Appropriate for students anticipating working in a family business, students who are considering acquiring and operating a franchise business or students considering acquiring and operating an existing small business. Students explore the key management issues facing these types of business today including interpersonal relations, succession/transition, business functions of marketing, sales, financial management, etc., in the special context of the unique challenges and opportunities of the family-owned, franchise and small business. Students will hear from and interact with family, franchise and small business owners who have agreed to visit classes and share their experiences. *Spring semester only, three hours.*

ENTR 424. SUPPLY CHAIN MANAGEMENT. This course will focus on providing an introduction to supply chain management. It will deal with both the logistical activities of demand fulfillment and the behavioral aspects of supply chain management. Experiential learning will take place within a simulation called, "Fundamentals of Supply Chain Management." This course will provide considerable insight into the management of supply chains. Students will develop disciplines and a knowledge of best practices that will facilitate their success in a world where demand and supply integration is one of the cornerstones of modern business. Students may not receive credit for both Management 424 and Entrepreneurship 424. *Spring semester only, three hours.*

ENTR 426. MUSIC MARKETING. This course will provide students with an overview of key music marketing principles, terms, and practices, which together form the foundation for all music marketing plans. Students will dig into the key areas of opportunities for musicians, including publicity, advertising, promotion (online and traditional), digital distribution, touring, licensing/synch, and radio. Students will learn what companies and partners to work with to reach their core fans, how to communicate with them, and the ways to leverage the changes and new opportunities that the internet offers to marketers. In addition, they will learn marketing ideas to help them describe their vision, identify a market need, analyze an artist's fan base, learn from their competitors, set marketing plan goals, and find the perfect mix of new marketing strategies ranging from branding, product, price, place, promotion, and marketing information systems. Students may only receive credit for one of Entrepreneurship 426, Marketing 426, or Music 426. Prerequisite: Marketing 204.
Fall semester only, three hours.

ENTR 430. ENTREPRENEURIAL FINANCE AND VENTURE CAPITAL. This course covers financial skills used by entrepreneurs and venture capitalists from the startup of a venture through its harvest. This includes a wide variety of topics including the financial elements of a business plan, the evaluation of new business opportunities, financial planning, sources of financing at different stages, valuation methods, essentials of security law, and methods of harvesting an investment. Prerequisite: Finance 301. *Fall semester only, three hours.*

ENTR 460. INDEPENDENT STUDY. Individual study of specialized topics in entrepreneurship. Prerequisites: Senior standing and permission of the department chair.
Semester course, one, two or three hours.

ENTR 466. BUSINESS PLANNING. This course provides students from all majors with a vehicle for turning their business and non-profit ideas into concrete viable business plans. Either as individuals or as teams, students research, create, and present a plan for a viable business or non-profit organization. They are coached by the instructor and may also be matched to an appropriate mentor

with experience in their area of interest. Successful completion of this course requires students to participate in the campus-wide business plan competition held during the spring semester. This course satisfies the Writing Intensive requirement for the Entrepreneurship major. Prerequisite: Entrepreneurship 430 and a business or non-profit idea. *Spring semester only, three hours.*

ENTR 467. CORPORATE INNOVATION. In this course, students have a unique opportunity to explore real-world innovation concepts in the context of working directly with a corporation. Corporate representatives work directly with Grove City College students each semester, providing students with business and technology concepts that engage them in terms of research, strategy, innovation and business case development. Students from a variety of disciplines collaborate in groups to explore, define, strategize, and develop the concept. The course utilizes a service-learning model, and benefits from the constant support of representatives of the partner company, who regularly attend classes for input and feedback. At the end of the semester, students present their findings and recommendations to corporate executives. *Spring semester only, three hours.*

ENTR 468. INNOVATION FOR IMPACT. Innovation and creativity are widely recognized as drivers of success in today's world for both individuals and organizations. Whether entities are nonprofits, startups, small companies, large companies, or governmental units, they are all looking to employ people who understand innovation. This course will provide students with an understanding of how different entities can innovate using design thinking methodology. As we explore how to innovate in concept, we will use that knowledge to attack problems faced by real organizations in our own community to explore how applying design thinking methodologies can have true impact on real-world organizations. Students will emerge from this course with a toolbox of innovation techniques, real project work that they can use as examples of their practice of those techniques, and the confidence that they are creative and innovative people. Students may not receive credit for both Entrepreneurship 468 and Marketing 468. *Fall semester only, three hours.*

ENTR 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in entrepreneurship. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ENTR 480. INTERNSHIP IN ENTREPRENEURSHIP. An opportunity for juniors and seniors, with a minimum of fifteen hours in their major, to participate in individual job experiences, domestic and international, under the supervision of an on-site manager and a department faculty member. Internship must be within an entrepreneurial organization. Products of the internship will include an evaluation by the on-site manager, a log of the internship experience, and a paper describing the experience. A comparison-contrast between academic learning and the internship experience will be conducted. Prerequisite: Minimum grade point average, permission of department coordinator, and an appropriate job site. *Semester course, one to six hours.*

ENTR 488. SEMINAR IN ENTREPRENEURSHIP. An advanced course for junior and senior Entrepreneurship majors to concentrate on specific subject matter to be determined by the instructor. Individual research and extensive oral and written reports are required.
Semester course; one, two, or three hours.

BUSINESS PROGRAM: DEPARTMENT OF MANAGEMENT AND MARKETING

Dr. Carson, Chair; Dr. Biddle, Mr. Butler, Dr. Crute, Ms. Havrilla, Dr. Kocur, Dr. Markley, Dr. Powell, Dr. J. Smith. Additional Instructional Faculty: Mr. Blaine, Dr. Coyne, Dr. DiStasi, Mr. Lewis, Mr. Miller.

The mission of the Business Program at Grove City College is to prepare our students to become effective and ethical leaders in business as well as in society as a whole. This mission incorporates the following learning outcomes:

1. Business Knowledge and Analytical Skills- Our students will possess the knowledge and analytical skills necessary in their professional field.
2. Communication Skills-Our students will possess the written and verbal skills needed to communicate effectively in a business environment.
3. Ethics-Our students will develop an understanding of business which reflects its moral and ethical responsibilities to all potential stakeholders.
4. Global Perspective-Our students will develop an understanding of the global and multi-cultural issues in the current business environment.

Five degree programs are offered in the Department of Management and Marketing: Bachelor of Science in Business Analysis, Bachelor of Science in Business Statistics, Bachelor of Science in International Business, Bachelor of Science in Management, and Bachelor of Science in Marketing. All five programs integrate the international aspects of business in course content as it applies to appropriate functional areas of study.

In addition to the five majors offered by the Department of Management and Marketing, the college also offers degree programs in Accounting, Business Economics, Economics, Entrepreneurship, and Finance. For more details on these majors, see the listings in this catalog for the Departments of Accounting and Finance, Economics, and Entrepreneurship.

Course Requirements for a Bachelor of Science Degree in Business Analysis—66-69 hours

Business Core (33 hours):

Accounting 201, 202; Computer Science 141, Finance 301; International Business 205; Management 103, 201, 214, 303, 486; and Marketing 104.

Economics Core (6 hours):

Economics 101, 102.

Business Analysis Major Requirements (18 hours):

Management 202, 204, 307, 310, Computer Science 220, and 244.

Business Analysis Concentration* (9-12 hours):

Complete one of the following concentrations:

Accounting: Accounting 301, 302, and three hours from Management 325 or any 300-400 level Accounting course.

Analytics: Mathematics 161, 162, and one of Mathematics 214, 232, 261, 262, or 331.

Finance: Finance 332, 341, and 440.

Marketing: Marketing 411, 415, and three hours from International Business 416, Management 325, Marketing 330, 370, 411, 417, 468, or 480.

Operations/Supply Chains: Management 302, 424, and three hours from Management 311, 325, 450, 457, 480, and International Business 417.

Software: Nine hours from Computer Science 222 or higher Computer Science courses and/or any DSCI courses.

Sports Management: Management 213, and six hours from Management 313, 325, 480 (max three hours), Exercise Science 201, 220, 235, or 305.

***Note:** Students who complete the requirements for a second major in Accounting, Business Economics, Computer Science, Economics, Entrepreneurship, Finance, International Business, Management, Marketing, or Mathematics are exempt from the Business Analysis Concentration requirement.

Courses that count in the Business Analysis major quality point average (MQPA):
All courses with "ACCT", "COMP", "DSCI", "ENTR", "FNCE", "INBS", "MARK", "MATH", "MNGT" prefix, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

The Business Analysis major prepares graduates for careers in business analysis, data analysis, project leadership, business management, market research, financial analysis, and management analysis.

Course Requirements for a Bachelor of Science Degree in Business Statistics—67-70 hours

Business Statistics Core (46 hours):
Computer Science 141, 220, 244; Data Science 215; Management 201, 202, 212, 314; Mathematics 161, 162, 214, 261, 331, and 332.

Business Core (12 hours):
Accounting 201; Finance 301; Management 103; and Marketing 104.

Business Statistics Concentration* (9-12 hours):
Complete one of the following concentrations:

Accounting: Accounting 202, 301, 302, and three hours from Management 325 or any 300-400 level Accounting course.

Business Analysis: Management 204, 307, and 310.

Economics: Economics 101, 102, and three hours of Economics courses.

Finance: Finance 341, Mathematics 232, and three hours from Finance 332, 435, 436, 440, 480, or Management 325.

Marketing: Marketing 411, 415, and three hours from Marketing 330, 370, 417, 468, 480, International Business 416, or Management 325.

Operations/Supply Chain: Management 204, 424, and three hours from Management 302, 307, 310, 311, 325, 450, 457, 480, and International Business 417.

Software: Nine hours from Computer Science 222 or higher Computer Science courses and/or any DSCI courses.

Sports Analytics: Management 213, and six hours from Management 313, 325, 480 (max three hours), Exercise Science 201, 220, 235, or 305.

***Note:** Students who complete the requirements for a second major in Accounting, Business Economics, Computer Science, Economics, Entrepreneurship, Finance, International Business, Management, Marketing, or Mathematics are exempt from the Business Statistics Concentration requirement.

Courses that count in the Business Statistics major quality point average (MQPA):
All courses with "COMP", "DSCI", "MNGT", "MATH" prefix, excluding MNGT 106. A minimum MQPA of 2.00 is required to graduate.

The Business Statistics major prepares graduates for careers in statistics in applied business contexts. Job titles include market researcher, financial risk analyst, investment analyst, business logistics specialist, management analyst, supply chain analyst, statistician, and others.

Course Requirements for a Bachelor of Science Degree in Human Resource Management—67 hours

Business Core (33 hours):

Accounting 201, 202; Finance 301; International Business 205; Management 103, 111, 201, 214, 303, 486; and Marketing 104.

Math/Economics Courses (10 hours):

Economics 101, 102; Mathematics 141 or 161.

Mathematics 141 prepares students in the business applications of calculus, but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.

Human Resource Major Core (15 hours):

Management 433, 457, 458, 462, and 465.

Human Resource Major Electives (9 hours):

Choose three courses from Management 110, 304, 307, 311, 475, 480 (max 3 hours), Accounting 303, Communication Arts 225, Psychology 208, or Psychology 310.

Courses that count in the Marketing major quality point average (MQPA):

All courses with "ACCT", "FNCE", "INBS", "MARK", "MNGT" prefix, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

The Human Resource Management major prepares graduates to pursue a career as a human resource professional in any form of organization including both for-profit and not-for-profit contexts. Students will be prepared to be a human resource generalist in smaller firms, as well as to occupy specialist roles in functional areas such as recruiting, compensation, benefits, training, and risk and insurance in larger firms.

Course Requirements for a Bachelor of Science Degree in International Business—82 hours

Business Core (33 hours):

Accounting 201, 202; Finance 301; International Business 205; Management 103, 111, 201, 214, 303, 486; and Marketing 104.

Math/Economics Courses (10 hours):

Economics 101, 102; and Mathematics 141 or 161.

Mathematics 141 prepares students in the business applications of calculus, but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.

International Business Core (9 hours):

Choose three courses from International Business 408, 416, 445 (required for Management and Marketing concentrations); Economics 202, 206, 303; Entrepreneurship 307, 312; or Finance 462 (required for Accounting and Finance concentrations). With advance Department Chair approval, Accounting, Entrepreneurship, Finance, International Business, Marketing, or Management 390 may count toward this requirement. Note: Students completing the Entrepreneurship Concentration may not count ENTR 312 toward the International Business Core.

Business Concentration (12 hours):

Complete one of the following six concentrations:

Accounting: Accounting 301, 303, 321, and any 300-400- level accounting course.

Economics: Economics 301, 302; and any two Economics courses. Note: Economics 202, 206, and 303 cannot be used to fulfill both the concentration and international business core requirements.

Entrepreneurship: Entrepreneurship 312, 430, and 466; and one course from Entrepreneurship 309, 318, or 423.

Finance: Finance 332, 440; and two courses from Finance 334, 341, 435, or 436.
Management: Management 457; and three courses from Management 302, 304, 307, 311, 433, 450, 458, or 475.
Marketing: Marketing 411, 419; and two courses from International Business 416, 417, Management 424; Marketing 315, 316, 412, 415, 417, or 420. Note: International Business 416 and 417 cannot be used to fulfill both the concentration and international business core requirements.

Global Emphasis (6 hours):
Choose two courses from Communication Arts 225; any Global Studies (GOBL) course; or any non-United States History or Political Science course.

Foreign Language Concentration (12 hours):
Choose one of the following three options (for placement and course sequencing, consult with the Department of Modern Languages):
French: One course from French 301, 305, or 340; French 307; and two 200-300-level French courses.
Spanish: Spanish 303 and three 200-300-level Spanish courses.
Other: Twelve credits in a single modern language with the approval of the Chair of the Department of Modern Language.

Foreign Study Requirement:
At least three hours must be earned outside the United States through an approved study abroad program (ABRD 300), Grove City College travel course, or Grove City College international internship.

Courses that count in the International Business major quality point average (MQPA):
All courses with "ACCT", "ENTR", "FNCE", "FREN", "INBS", "MARK", "MNGT", "SPAN" prefix, COMM 225, ECON 303, GOBL 300, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

The International Business major focuses on the international context of business and is designed to prepare students for participation in worldwide business activity. This program combines substantial preparation in international business, business, modern languages, and other related international courses. International Business majors are strongly encouraged to take additional advanced courses in culture, literature, and grammar in their chosen language of study and to study an additional foreign language.

Course Requirements for a Bachelor of Science Degree in Management—67 hours

Business Core (33 hours):
Accounting 201, 202; Finance 301; International Business 205; Management 103, 111, 201, 214, 303, 486; and Marketing 104.

Math/Economics Courses (10 hours):
Economics 101, 102; and Mathematics 141 or 161.
Mathematics 141 prepares students in the business applications of calculus, but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.

Management Major Core (9 hours):
Management 457, 475, and one course from Management 307, 311, 424, 433, 458, or 480*.

Management Concentration (15 hours):
Complete one of the following four concentrations:
Entrepreneurship: Entrepreneurship 101, 201; and nine hours from the following: Entrepreneurship 307, 309, 312, 314, 317, 319, 466; Management 433; or Entrepreneurship or Management 480* (max three hours).

Human Resources: Management 465 and 12 hours from the following (minimum of nine hours of ACCT and MNGT courses): Management 304, 307, 311, 433, 458, 480* (max three hours); Accounting 303; Psychology 208, 214, 310; Sociology 208; Social Work 342 or 382.

Operations/Supply Chain: Management 204, 302, 424, and six hours from Accounting 303; International Business 417, 445; Marketing 316, 412, 417; Management 307, 310, 311, 325, 433, 450, 458, 480* (max three hours; Communication Arts 104, 303, 459; Psychology 214; Social Work 382; Mechanical Engineering 210 or 303.

Sports Management: Management 213, 313, 480 (3 hours); and seven hours from the following: Exercise Science 201, 220, 235, 305; Management 307, 311, 325, 433; Marketing 316, or 420.

*Note: The course chosen to complete the Management Core Elective cannot be used to fulfill a Management Concentration Elective. In addition, students choosing to complete an internship experience for both the Management Major Core elective and management concentration may not use a single internship experience to fulfill both requirements. In order to receive internship credit in both areas, students must complete two 3-credit internships, recommended during the summer following the sophomore and junior years. A maximum of six internship credits can be applied toward the 128 required for graduation.

Courses that count in the Management major quality point average (MQPA):

All courses with "ACCT", "ENTR", "FNCE", "INBS", "MARK", "MNGT" prefix, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

The Management major prepares graduates for the modern challenges facing managers in many types of organizations. These include, but are not limited to, for-profit, not-for-profit, and governmental organizations of any size. Graduates pursue careers a variety of organizational contexts including retail, consulting, financial services, manufacturing, arts and entertainment and many more.

Course Requirements for a Bachelor of Science Degree in Marketing—67 hours

Business Core (33 hours):

Accounting 201, 202; Finance 301; International Business 205; Management 103, 111, 201, 214, 303, 486; and Marketing 104.

Math/Economics Courses (10 hours):

Economics 101, 102; Mathematics 141 or 161.

Mathematics 141 prepares students in the business applications of calculus, but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.

Marketing Major Core (12 hours):

Marketing 315, 411, 415, and 419.

Marketing Major Electives (12 hours):

Choose four courses from International Business 416, 417, Marketing 316, 328, 330, 412, 416, 417, 420, 426, 468, 480, or Marketing 390 with department chair approval.

Courses that count in the Marketing major quality point average (MQPA):

All courses with "ACCT", "ENTR", "FNCE", "INBS", "MARK", "MNGT" prefix, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

Marketing is the broad link between organizations and the marketplace. Every organization must understand both customers and competitors in order to survive. Accordingly, marketing as a discipline comprises diverse career paths, including marketing

management, marketing communication, design, customer experience, digital marketing, logistics, sales, and market intelligence. Students who major in Marketing and wish to further specialize are encouraged to consider adding a related minor (or taking additional courses) in design, sales, analytics, digital marketing, entrepreneurship or communication.

Writing, Speaking and Information Literacy Intensive Courses

It is essential for students majoring in the Department of Management and Marketing to possess strong writing, speaking, and information literacy (knowing how to locate, analyze, and use information in decision-making) skills in preparation for careers in business/accounting or graduate studies. The curriculum requirements specifically designed to develop these skills include Management 214, *Business, Ethics, and Society* and Management 486, *Business Policy and Strategy*. Please see course descriptions that follow for more information.

Course Sequencing for the Business Core

For all majors within the Department of Management and Marketing, the following business core courses applicable to the major must be completed before the beginning of the junior year and prior to registering for any 400-level course in the Department: Accounting 201, 202; Management 103, 111, 201, 214; Marketing 104; Economics 101, 102; and Mathematics 141 or 161. International Business 205 and Finance 301 must be taken before the beginning of the senior year.

Course Requirements for a minor in Business (18 hours)

(Restricted to non-Business Program majors only)

A minor in Business shall consist of Accounting 201, 202; Finance 301; Management 103, 201; and Marketing 104.

Course Requirements for a minor in Business Analysis (18 hours)

A minor in Business Analysis shall consist of Management 201, 202, 310; Computer Science 141, 244; and three hours from Management 204, 307, or Computer Science 155.

Course Requirements for a minor in Digital Marketing (18 hours)

A minor in Digital Marketing shall consist of Marketing 104, 315, 328, 330; Entrepreneurship 309; and three hours from Management 325, Entrepreneurship 470, or Marketing 480. Note: Students wishing to receive credit for Marketing 480 – Internship in Digital Marketing – and internship credit toward a Marketing major elective may not use the same internship experience to count for both. Rather, two separate internships must be completed, usually in the summers following the sophomore and junior years.

Course Requirements for a minor in Human Resource Management (18 hours)

(Restricted to non-Human Resource Management and non-Management majors only)

A minor in Human Resource Management shall consist of Management 103, 433, 457, 458, 462, and 465

Course Requirements for a minor in International Business (18 hours)

(Restricted to non-International Business majors only)

A minor in International Business shall consist of International Business 205, 445; six hours of 200-level or higher foreign language courses; and two courses from International Business 416, 417, Economics 206, 303, 390, or Entrepreneurship 307.

Course Requirements for a minor in Management (18 hours)
(Restricted to non-Management majors only)

A minor in Management shall consist of Management 103, 457, 475; and three courses from Management 302, 304, 307, 325, 424, 433, 450, 458, 464, 465, or 480.

Course Requirements for a minor in Marketing (18 hours)
(Restricted to non-Marketing majors only)

A minor in Marketing shall consist of Marketing 104, 315, 411, 415, 419; and one course from Marketing 316, 412, 417, 420, or 480.

Course Requirements for a minor in Sales (18 hours)

A minor in Sales shall consist of Marketing 104, 316, 416; Management 311; and six hours from Management 213, 307; Communication Arts 104; Marketing 412, or 480. Note: Students wishing to receive credit for Marketing 480 – Internship in Sales – and internship credit toward a Marketing major elective may not use the same internship experience to count for both. Rather, two separate internships must be completed, usually in the summers following the sophomore and junior years.

Course Requirements for a minor in Sports Management (18 hours)
(Restricted to non-Management majors only)

A minor in Sports Management shall consist of Management 103, 213, 313, 480 (3 cr); and seven additional hours from Exercise Science 201, 220, 235, 305; Marketing 316, 420; Management 307, 311, 325, or 433.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

INTERNATIONAL BUSINESS (INBS)

INBS 205. GLOBAL BUSINESS ISSUES. Designed to acquaint the student with the dynamic environment in which businesses must operate globally, including the challenges posed by political risk, cultural barriers, and differences in economic and legal systems, as well as those aspects of international business management not associated with traditional functional areas including international trade; foreign currency transactions; theory and institutions; country analysis; and international business strategy. Prerequisites: Sophomore standing or instructor permission.
Semester course, three hours.

INBS 260. INDEPENDENT STUDY. Individual study of specialized topics in international business. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

INBS 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in international business. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

INBS 360. INDEPENDENT STUDY. Individual study of specialized topics in international business. Prerequisites: Junior standing and permission of the department chair.
Semester course, one, two or three hours.

INBS 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in international business. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

INBS 390. STUDIES IN INTERNATIONAL BUSINESS. Studies in areas of international business not fully covered by regular departmental offerings. *Semester course, three hours.*

INBS 408. SOCIAL ENTREPRENEURSHIP PRACTICUM. Using case studies, lectures, and hands-on exercises, this course clarifies and illustrates the steps necessary to prepare to launch a social enterprise. Topics include the idea generation, business models, organizational structure, staffing, governance, funding, and measurement of social impact. Over the course of the semester, students will prepare business plans for their own social enterprises. Students may only receive credit for only one of International Business 408 or Entrepreneurship 408. *Semester course, three hours.*

INBS 416. INTERNATIONAL MARKETING. An introduction to marketing management on a global scale including social and cultural dimensions of marketing; economic environments; political and financial risks; cross-cultural consumer behavior; and international product and channel decisions. Prerequisite: International Business 205. *Semester course, three hours.*

INBS 417. GLOBAL SUPPLY CHAINS. An understanding of supply chains is essential to the global marketplace including social and cultural dimensions of business practices in international economies; international logistics; political and financial risks; cross-cultural vendor interactions; and international product and channel decisions. This course will examine international supply chains and how various functional organizations including Marketing, Finance, Human Resources must interact with global supply chains in order to meet their business objectives. *Three hours*

INBS 445. INTERNATIONAL TRADE. This course surveys policies and international business practices of international trade, including coverage of international logistics, customs and tariffs, export control law, international contracts, resolution of trade disputes, and international trade organizations. Prerequisite: International Business 205. *Semester course, three hours.*

INBS 460. INDEPENDENT STUDY. Individual study of specialized topics in international business. Prerequisites: Senior standing and permission of the department chair.
Semester course, one, two or three hours.

INBS 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in international business. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

INBS 480. INTERNSHIP IN INTERNATIONAL BUSINESS. This is an opportunity for students to participate in a meaningful learning experience under the supervision of both an employer and a Management and Marketing Department faculty member. Most internships take place during the summer months. Students will be graded based on an employer performance evaluation along with a written paper and journal. Prerequisites: Good academic standing and completion of the freshman year of study. *Semester course, one to six hours.*

MANAGEMENT (MNGT)

MNGT 103. PRINCIPLES OF MANAGEMENT. An introduction to the theory and practice of management. Students are introduced to management history, ethics, global issues, and other challenges. The four basic managerial functions of planning, organizing, leading, and controlling are explored in detail. Throughout, attention is given to a Christian perspective on these topics.
Semester course, three hours.

MNGT 106. FUNDAMENTALS OF BUSINESS. A general introduction to the organizational environment and operations of contemporary businesses. The course examines the United States business system and how it interacts with global systems; the basic management functions of planning, organizing, leading, and controlling; entrepreneurship and small businesses; marketing processes and consumer behavior; managing operations and information; and financial management. Integrated into these topics are Christian principles that should guide ethical business practices.
Semester course, three hours.

MNGT 110. EXCEL. Nearly all businesses require new hires to be proficient in Excel. Students will learn how to use Excel in a variety of business fields. This course culminates in a final exam that, if successful, will result in students achieving Microsoft certification in Excel. *An additional fee is charged for this course.* *Online only, three hours.*

MNGT 111. BUSINESS COMPUTER APPLICATIONS. This course provides business majors with instruction and practical exercises using Microsoft Office to solve business problems. It integrates applications of Microsoft Office into the business environment in such a way that students learn to use the software to prepare reports, design oral presentations, collaborate with one another, and utilize spreadsheets to organize information and summarize data. Business, accounting, financial and scientific problems and applications are emphasized. This course must be taken in the freshman or sophomore year. *Semester course, three hours.*

MNGT 120. ADVANCED EXCEL. Nearly all businesses require new hires to be proficient in business uses of Excel. Students will build on the Excel knowledge acquired in Management 110 and demonstrate advanced proficiency. Students will utilize advanced techniques in Excel (macros, nested functions, PivotTables, and PivotCharts, for example) to answer real-world organizational questions. This course culminates in a final exam that, if successful, will result in students achieving the Microsoft Expert certification in Excel. Prerequisite: Management 110 or MOS Basic Excel Certification. *An additional fee is charged for this course.* *Online only, three hours.*

MNGT 201. BUSINESS STATISTICS. A course designed to familiarize the student with basic statistical techniques used in the management decision-making process, including probability distributions, descriptive statistics, confidence intervals, hypothesis testing, and parametric and nonparametric hypothesis testing. Students may only receive credit for one of Management 201, Mathematics 201, or Psychology 201. *Semester course, three hours.*

MNGT 202. ADVANCED BUSINESS STATISTICS. Based on principles learned in the first business statistics course, this course will study techniques for creating effective predictive models. Topics include simple regression models, multiple regression models, model building, model analysis, time series and forecasting, and experimental design. Students will learn the basics of statistical software and begin to understand some concepts behind machine learning. Prerequisite: Management 201, Mathematics 201, or Psychology 201. *Semester course, three hours.*

MNGT 204. OPERATIONS MANAGEMENT. Introduction to the design, planning, control and improvement of business operations for both goods-producing and service-rendering organizations. Organizational and management impacts resulting from product development, process management, and supply chain management is explored in detail. Prerequisite: Management 202.
Semester course, three hours.

MNGT 212. DATA ANALYSIS RESEARCH METHODS. This course examines the fundamentals of research approaches and methods of statistical sciences. The course will explore the entire research task including problem definition, literature review, experimental design, data collection, analysis, and communication of conclusion. This course will have the opportunity to culminate in basic research posters and presentations for local and/or national conferences. Prerequisite: Management 202.
Semester course, three hours.

MNGT 213 PRINCIPLES OF SPORTS MANAGEMENT AND MARKETING. This course explores the basic concepts and principles of the sport and recreation business. Emphases will be on the principles of management, marketing, finance, and economics applied to sports management and marketing. Topics include event and venue management, legal considerations, sales, promotion, revenue generation, branding, and public relations. *Semester course, three hours.*

MNGT 214. BUSINESS, ETHICS, AND SOCIETY. An examination of various ethical and moral issues arising in contemporary business and its activities which affect our society and the world. This course also examines the nature and purpose of economic life and contemporary business, especially

from the Christian perspective. This course satisfies the Writing Intensive (WI) and Information Literacy (IL) requirements for all business majors. Prerequisite: Sophomore standing and Business Program majors only. *Semester course, three hours.*

MNGT 260. INDEPENDENT STUDY. Individual study of specialized management topics. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

MNGT 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised management-related research. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

MNGT 302. LEAN MANAGEMENT. An examination of the general theory of lean management and the twenty keys to workplace improvement. Topics include just-in-time, supplier development, and skill versatility. Students completing this course may choose to sit for a (fee based) Lean Six Sigma certification exam. *Semester course, three hours.*

MNGT 303. BUSINESS LAW. A survey of law crucial to the conduct of business, including an introduction to the nature of law, legal reasoning, and dispute resolution as well as to the law of contracts, torts, crimes, agency, business associations, and intellectual property. Students may not receive credit for both Management 303 and Entrepreneurship 303. *Semester course, three hours.*

MNGT 304. LEGAL ENVIRONMENT OF BUSINESS. Managers need to be prepared to understand and navigate the complex world of federal and state regulation on topics such as employment law, antitrust law, environmental law, consumer protection law, internet law, intellectual property law, and securities law. This course not only provides a thorough consideration of the applicable law, but also addresses the ethical principles, fundamental values, and policy issues relevant to each topic. Prerequisite: Management 303 or Entrepreneurship 303. *Semester course, three hours.*

MNGT 307. PROJECT TEAMS AND LEADERSHIP. This course provides the student with team-building skills, team dynamics, and project management skills in alignment with prevailing project management methodology. Students completing this course may choose to sit for a (fee based) CAPM certification exam offered through PMI. Prerequisite: Sophomore standing. S*emester course, three hours.*

MNGT 310. BUSINESS DASHBOARDING. This course will study techniques for creating effective visual stories via dashboards. Topics include visual story telling models, exploratory data analysis, visualization software, interaction techniques, graphical perception, color, animation, dimensional data, temporal visualization, and text visualization. Prerequisite: Management 202; corequisites: Accounting 202 and Marketing 104. *Semester course, three hours.*

MNGT 311. NEGOTIATION. Negotiation is the art and science of securing agreements between two or more parties who are interdependent and who are seeking to maximize their outcomes. The central issues of this course deal with understanding the behavior of individuals, groups, and organizations in the context of competitive situations. It is designed to complement the technical and diagnostic skills learned in other courses, with a basic premise being that while a manager needs analytical skills to discover optimal solutions to problems, a broad array of negotiation skills is needed for these solutions to be accepted and implemented. Considerable emphasis will be placed on simulations, role-playing, and cases. *Semester course, three hours.*

MNGT 313 SPORT AND EVENT MANAGEMENT PRACTICUM. This course is designed to introduce students to the logistics of sport event and venue management. Student will obtain hands on experience in planning, organizing, marketing, managing risk, managing facilities, working with stakeholders, and other related activities in the course of administering an actual sporting event. Prerequisites: Management 213 and junior standing. *Semester course, two hours.*

MNGT 314. ADVANCED ANALYTICAL METHODS. This course will explore in detail how to conduct non-linear analysis. Optimization techniques will focus on non-integer as well as integer-programming problems. Stochastic modeling techniques will be presented by way of coding systems of non-normal distributions. Queueing theory will also be studied. Students will have the opportunity to code basic simulations. Prerequisite: Mathematics 214. *Semester course, three hours.*

MNGT 323. ADVANCED BUSINESS LAW. Exploration of advanced legal topics important for business and accounting including negotiable instruments; agency; secured transactions and creditors' rights; bankruptcy; forms of business associations; securities law; and real property. Prerequisite: Management 303. *Semester course, three hours.*

MNGT 324. LEGAL ASPECTS OF THE MUSIC BUSINESS. This course is designed to analyze the most important legal issues in the contemporary music industry, including how these issues began, how they have evolved, and where they are headed. Students will explore copyright law, including fair use and public domain, and how it affects sampling, interpolation, and mashups. The course will explore contracts related to songwriting, 360° deals, revenue sharing, and more, in addition to legal documents related to bands, booking, and touring. Students will also explore contemporary and new means of creating and disseminating music, including streaming audio/video and augmented/virtual reality, and explore associated legal implications. Students may only receive credit for one of ENTR 324, MNGT 324, or MUSI 324. *Spring semester only, three hours.*

MNGT 325. MANAGERIAL PERSPECTIVES IN BUSINESS ANALYSIS. This course focuses on developing a managerial understanding of the strategic role data can play in a cross-functional organization. Using lecture, case analysis, and hands-on exercises, this course will prepare students for entry into a data driven business world by highlighting fundamental analytical tools, outlining how technology enables and empowers business decision making, and by exploring cutting edge trends in business analytics and decision making. Additionally, legal and ethical issues raised by a data-driven business world will be discussed from a Christian perspective. Prerequisite: Sophomore standing. Prerequisite: Sophomore standing. *Semester course, three hours.*

MNGT 326. INTRODUCTION TO THE BUSINESS OF MUSIC. This course is designed as an introduction to the business of music, providing students with the latest instruction on best practices for music creators, consumers, and facilitators working in this field. Students will have the opportunity to learn the fundamental principles involved in the entrepreneurial and legal dimensions of the music business, exploring the structural and functional components of this ever-changing and rapidly growing industry. Particular attention will be given to the challenges of starting, growing and managing a music business in the digital era. Students may only receive credit for one of Entrepreneurship 326, Management 326, or Music 326. *Semester course, three hours.*

MNGT 360. INDEPENDENT STUDY. Individual study of specialized management topics. Prerequisites: Junior standing and permission of the department chair.
Semester course, one, two or three hours.

MNGT 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised management-related research. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

MNGT 390. STUDIES IN MANAGEMENT. Studies in areas of management not fully covered by regular departmental offerings. *Semester course, three hours.*

MNGT 424. SUPPLY CHAIN MANAGEMENT. The focus of this course is to provide an introduction to supply chain management. It will deal with both the logistical activities of demand fulfillment and the behavioral aspects of supply chain management. Experiential learning will take place within a simulation called, "Fundamentals of Supply Chain Management." This course will provide considerable insight into the management of supply chains. Students will develop disciplines and a knowledge of best practices that will facilitate their success in a world where demand and supply

integration is one of the cornerstones of modern business. Students may not receive credit for both Management 424 and Entrepreneurship 424. *Semester course, three hours.*

MNGT 433. RISK MANAGEMENT AND INSURANCE. An introduction to and study of risk and liability exposures that face businesses and individuals. Topics include risk management techniques, the insurance industry, and employee benefits packages. Prerequisite: Junior or senior standing.
Semester course, three hours.

MNGT 450. QUALITY MANAGEMENT. An examination of the philosophies, principles, and techniques used to study, gain control, and improve processes. Topics include the thought leaders, Six Sigma, tools of QC, designed experiments, and the Baldrige Award criteria. Prerequisite: Management 201 or equivalent. *Semester course, three hours.*

MNGT 457. HUMAN RESOURCES MANAGEMENT. This course examines the principles, policies and practices of human resources important for being an effective manager in today's organizations. Human resource topics include EEOC and legal guidelines, recruitment, selection, training, compensation, employee appraisal, and discipline systems. Prerequisite: Management 103 and junior or senior standing. *Semester course, three hours.*

MNGT 458. ORGANIZATIONAL BEHAVIOR. An examination of individual, interpersonal, and organizational processes in contemporary organizations emphasizing motivation, job design, performance management, group and team dynamics, leadership, and decision-making. Also covered are organizational culture, design, and change management. The course emphasizes contemporary theories and trends in organizational structures and processes. The course includes extensive use of case studies and applications of theories to management practice. Prerequisite: Management 103.
Semester course, three hours.

MNGT 460. INDEPENDENT STUDY. Individual study of specialized management topics. Prerequisites: Senior standing and permission of the department chair.
Semester course, one, two or three hours.

MNGT 462. EMPLOYEE COMPENSATION AND BENEFITS. This course covers the breadth and depth of issues related to the professional management of employee benefits and compensation systems. Human resource policies and practices will be discussed. Applicable law, regulation, and case law will be covered. Specific topics include retirement plans, health coverage, paid time off, salary and hourly pay systems, and additional incentive practices. Prerequisite: Management 457.
Semester course, three hours.

MNGT 465. ADVANCED HUMAN RESOURCES. This course provides an in-depth examination of advance topics in human resource management. Emphasized topics include labor relations and collective bargaining, recruitment and retention strategies, employee selection, performance appraisal, and legal issues. Taught as a seminar course. Prerequisite: Management 457.
Semester course, three hours.

MNGT 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised management-related research. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

MNGT 475. LEADERSHIP. A study of historical and current perspectives on leadership theory and practice with the incorporation of Christian principles. Leadership theories are made practical through lectures, class activities, case studies, guest speakers, and assignments. Students will learn more about their strengths through assessments and self-reflection. The course is treated as a seminar, and thus focused on discussion and many student-led activities. Prerequisites: Management 103 and junior or senior standing; or instructor permission. *Semester course, three hours.*

MNGT 478. SEMINAR IN LIFE MANAGEMENT. This seminar is intended to provide senior students with practical advice for navigating the transition to post-college life. Finances, risk, health,

professional responsibilities and interpersonal relationships are important aspects of life that need to be managed. These and other related topics will be addressed in the seminar.

Senior Standing, one hour.

MNGT 480. INTERNSHIP IN MANAGEMENT. This is an opportunity for students to participate in a meaningful learning experience under the supervision of both an employer and a Management and Marketing Department faculty member. Most internships take place during the summer months. Students will be graded based on an employer performance evaluation along with a written paper and journal. Prerequisites: Good academic standing and completion of the freshman year of study.

Semester course, one to six hours.

MNGT 486. BUSINESS POLICY AND STRATEGY. This course presents the basic concepts and tools used in strategic business analysis and applies those concepts and tools to the formulation, implementation, and evaluation of organizational business strategy. This course also represents the Grove City College Business program's capstone course. As such it will integrate the knowledge and skills gained across previous business coursework and help the student to form a total business perspective, including the application of Christian values in the workplace. This course satisfies the Speaking Intensive (SI) requirement in the Business Program. Prerequisite: Senior status; majoring in the Departments of Accounting & Finance and/or Management and Marketing.

Semester course, three hours.

MARKETING (MARK)

MARK 104. PRINCIPLES OF MARKETING. An introduction to the terms and concepts used in marketing. Study focuses on all aspects of the marketing process, including market analysis and information, consumer and business buying behavior, marketing strategy, the marketing mix, and legal and ethical issues. Discussion covers global, digital, and sustainability implications. The goal is to understand key basic marketing concepts and be able to practically apply knowledge to marketing decisions. Discussion also incorporates the application of Christian values in the workplace.

Semester course, three hours.

MARK 260. INDEPENDENT STUDY. Individual study of specialized marketing topics. Sophomore standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MARK 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised marketing research. Sophomore standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MARK 315. DIGITAL MARKETING. This course provides an in-depth study of the rapidly growing and evolving area of digital marketing. In addition to understanding the basic components of digital marketing, students will focus on learning how specific elements of digital marketing, including websites, social media, and mobile technology can be utilized as integrated parts of a comprehensive marketing plan. Lecture, case studies, guest speakers, and in-class exercises will be utilized to provide understanding and relevancy of this key component within the marketing discipline. In addition, students will also explore ethical issues related to marketing in a digital world from a Christian perspective. Prerequisite: Marketing 104. *Semester course, three hours.*

MARK 316. SALES. This course focuses on professional selling from a client-focused, non-manipulative sales perspective. Students will learn and apply the principles of professional selling and the role of sales management through lecture, access to guest speakers in the sales discipline, and hands-on activities. Students will also explore ethical issues found in the sales discipline from a Christian perspective. Prerequisite: Marketing 104. *Semester course, three hours.*

MARK 328. CONTENT MARKETING. Students will probe the subject of content marketing as a core discipline for 21st century entrepreneurs. They will learn essential concepts for strategic content development and web-based thought leadership and will acquire skills for use with practical web applications. Students will engage in a semester-long project using WordPress to publish Internet

content for a company or organization, employing techniques learned in a class. The structure of the class will include two teaching sessions per week and a WordPress lab. Students may not receive credit for both Marketing 328 and Entrepreneurship 328. *Semester course, three hours.*

MARK 330. SEARCH ENGINE OPTIMIZATION. Students will explore the fundamental principles and best practices in the field of search engine optimization. They will learn and develop the essential knowledge and skills required to achieve favorable organic rank in the most important search engines and will become familiar with and interact with experts in the industry. Case studies and actual business scenarios will be examined in detail. Students will have opportunity to conduct SEO research for small businesses and non-profit organizations in semester-long team projects with other students. Students may not receive credit for both Marketing 330 and Entrepreneurship 330.
Semester course, three hours.

MARK 360. INDEPENDENT STUDY. Individual study of specialized marketing topics. Prerequisites: Junior standing and permission of the department chair.
Semester course, one, two or three hours.

MARK 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised marketing research. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

MARK 390. STUDIES IN MARKETING. Studies in areas of marketing not fully covered by regular departmental offerings. *Semester course, three hours.*

MARK 411. MARKETING RESEARCH. An introduction to the major areas of marketing research and information from a managerial perspective. Students will learn how to determine when and what type of market research to do, what objectives to pursue, and how to assess market research learnings. Incorporating market research within the context of market information, this course explores problem definition, research design, questionnaire development, sampling, interviewing, analysis, and reporting. It incorporates key ethical issues and application of Christian values in the workplace. Prerequisites: Management 201, Marketing 104, and senior standing. *Semester course, three hours.*

MARK 412. RETAIL MANAGEMENT. An in-depth look at the dynamic field of retail marketing. A balanced blend of theory and application (using current examples) will help students learn how to analyze and develop effective retailing strategies. Emphasized topics include buying, merchandising, and selling functions; inventory, financial, and employee management; and targeting, location and promotion objectives. Study also investigates inherent ethical issues and discusses how Christian principles can be applied. Prerequisite: Marketing 104 and junior or senior standing.
Semester course, three hours.

MARK 415. STRATEGIC MARKETING. This capstone marketing course utilizes business course work to date and enables students to demonstrate strategic marketing mastery and business application in three critical areas: 1) role of marketing in the development of successful strategies, 2) marketing opportunity analysis, and 3) developing, implementing, and managing strategic marketing programs. It applies marketing principles to real world situations through case study analysis and/or project applications, discussions, presentations, and exposure to business professionals. While focused on marketing, discussion will incorporate financial and management strategies. It also incorporates key ethical issues and application of Christian values in the workplace. Prerequisite: Marketing 104 and senior standing. *Semester course, three hours.*

MARK 416. SALES MANAGEMENT. This course is focused on the principles, methods, and issues found in professional, business-to-business sales force management. Students will gain exposure to and experience with the responsibilities of a sales manager and an understanding of the strategic role played by sales within an organization. Prerequisite: Marketing 316. *Spring semester only, three hours.*

MARK 417. NEW PRODUCT DEVELOPMENT AND MANAGEMENT. This course encompasses a comprehensive study of the new product development and management process. It is

intended for students who are interested in learning how new products and services are developed and managed. Since New Product Development is a cross functional discipline, the content is relevant for students preparing to lead an organization to understand customer needs, to innovate and translate those needs to new products and services, and to profitably grow a business. It incorporates case study analysis and/or project applications, discussions, presentations, and exposure to business professionals. Discussion incorporates key ethical issues and the application of Christian values in the workplace. Prerequisite: Marketing 104. *Semester course, three hours.*

MARK 419. CONSUMER BEHAVIOR. An examination of consumer decision-making in the marketplace, emphasizing the effects of internal factors such as motivation, personality, learning, emotion, and attitudes; external factors such as culture, subcultures, reference groups, demographics, and social status; and the steps in the consumer decision-making process. The course incorporates an examination of what it means to be both a Christian and a consumer. Prerequisite: Marketing 104 and junior or senior standing. *Semester course, three hours.*

MARK 420. ADVERTISING. A critical exploration of the purposes and functions of advertising, public relations and sales promotion in the growth and development of the global market economy. Study focuses on the basic principles of researching, creating, and executing promotional campaigns, and includes an examination of corporate responsibility and Christian ethics in advertising. Prerequisite: Marketing 104 and junior or senior standing. *Semester course, three hours.*

MARK 426. MUSIC MARKETING. This course will provide students with an overview of key music marketing principles, terms, and practices, which together form the foundation for all music marketing plans. Students will dig into the key areas of opportunities for musicians, including publicity, advertising, promotion (online and traditional), digital distribution, touring, licensing/synch, and radio. Students will learn what companies and partners to work with to reach their core fans, how to communicate with them, and the ways to leverage the changes and new opportunities that the internet offers to marketers. In addition, they will learn marketing ideas to help them describe their vision, identify a market need, analyze an artist's fan base, learn from their competitors, set marketing plan goals, and find the perfect mix of new marketing strategies ranging from branding, product, price, place, promotion, and marketing information systems. Students may only receive credit for one of Entrepreneurship 426, Marketing 426, or Music 426. Prerequisite: Marketing 104.
Semester course, three hours.

MARK 460. INDEPENDENT STUDY. Individual study of specialized marketing topics. Prerequisites: Senior standing and permission of the department chair.
Semester course, one, two or three hours.

MARK 468. INNOVATION FOR IMPACT. Innovation and creativity are widely recognized as drivers of success in today's world for both individuals and organizations. Whether entities are nonprofits, startups, small companies, large companies, or governmental units, they are all looking to employ people who understand innovation. This course will provide students with an understanding of how different entities can innovate using design thinking methodology. As we explore how to innovate in concept, we will use that knowledge to attack problems faced by real organizations in our own community to explore how applying design thinking methodologies can have true impact on real-world organizations. Students will emerge from this course with a toolbox of innovation techniques, real project work that they can use as examples of their practice of those techniques, and the confidence that they are creative and innovative people. Students may not receive credit for both Marketing 468 and Entrepreneurship 468. *Fall semester only, three hours.*

MARK 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised marketing research. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

MARK 480. INTERNSHIP IN MARKETING. This is an opportunity for students to participate in a meaningful learning experience under the supervision of both an employer and a Management and Marketing Department faculty member. Most internships take place during the summer months.

Students will be graded based on an employer performance evaluation along with a written paper and journal. Prerequisites: Good academic standing and completion of the freshman year of study.
Semester course, one to six hours.

DEPARTMENT OF CHEMISTRY

Dr. Augspurger, Chair; Dr. Cramer, Dr. DiStasi, Dr. Falcetta, Dr. Guevara, Dr. T. Homan, Dr. Kriley, Dr. Shaw, Dr. Wong.

CHEMISTRY DEPARTMENT MISSION STATEMENT, OBJECTIVES, AND OUTCOMES

The Department of Chemistry is traditional in its approach to the discipline of chemistry and offers a rigorous and well-balanced curriculum. This provides the student with a strong preparation for graduate studies and/or a career in chemistry. The department faculty expertise covers all major areas of chemistry. A variety of research experiences are available to majors through ongoing faculty research programs. In addition, the department attempts to instill in its students an awareness of the beauty and design in nature that reflects the creative hand of God.

There are four separate majors offered within the department:

- **Chemistry:** The traditional chemistry major provides a strong preparation for graduate school or employment in the chemical industry.
- **Biochemistry**: This major provides a strong preparation for graduate or professional schools or for employment in biochemical, molecular biology or genetics industry.
- **Chemistry Secondary Education Certification**: This major prepares the student for teaching chemistry at the secondary school level. It is a program that combines a traditional chemistry curriculum with a number of education courses.
- **Chemistry and General Science Secondary Education Certification**: This is essentially the same as Chemistry Secondary Education major. These students, however, in addition to all the chemistry and education courses will take Astronomy and either Geology or Environmental Science. This will qualify them for General Science certification.

Success in the chemical profession requires the ability to search the chemical literature and chemical databases and to effectively communicate that information in written and oral form. Chemists need to be proficient with software designed to operate instruments, analyze data and present results. The Writing Intensive (WI), Speaking Intensive (SI) and Information Literacy (IL) courses in the Chemistry Department are designed to fulfill these academic and professional requirements.

Chemistry Department Program Objectives

Graduates will be prepared with the knowledge and technical skills to successfully pursue career paths in the chemical industry, secondary education, chemistry graduate studies or other professional programs.

Graduates will be prepared to display critical thinking and problem-solving skills to enable them to learn, grow and be effective throughout their professional careers.

Graduates will gain knowledge and develop skills within the context of a Christian worldview, including the Christian foundations of science and the practice of chemistry, both ethical and in conduct, according to Christian principles.

Chemistry Department Program Outcomes

Graduates of the Chemistry Department will demonstrate:

1. Knowledge in the areas of general, analytical, organic, physical, inorganic chemistry and biochemistry according to ACS standards.
2. An ability to apply chemical principles and knowledge to solving chemical problems.
3. Knowledge of the mathematical and physical basis of chemical theories.
4. An ability to use laboratory techniques and skills to effectively conduct experiments and interpret results.
5. An ability to accurately maintain a laboratory notebook.
6. Proficiency in the operation of modern instrumentation and the ability to analyze and interpret instrumental data.
7. An ability to search the chemical literature as well as read and comprehend content in professional chemistry journals.
8. An ability to effectively communicate chemical information in written and oral forms according to ACS guidelines.
9. Knowledge of the foundations and the practice of science from a Christian perspective.

Departmental policy limits students to one major within the Department of Chemistry.

Course Requirements for Bachelor of Science Degree in Chemistry—75 hours

Chemistry Core (42 hours):

Chemistry 111, 112, 113, 114, 227, 231, 235, 241, 242, 245, 345, 346, 406, 422, 431, and 488.

Chemistry Concentration (10 hours):

Choose one of the following six options:

- **No concentration:** choose any 10 hours of Chemistry electives from the choices below.
- **ACS Certified:** Chemistry 351, 463; and four hours of Chemistry electives from the choices below.
- **Biochemistry:** Chemistry 351, 352 and two hours of Chemistry electives from the choices below.
- **Computational Modeling**: Computer Science 220, 222; Chemistry 445, 471 and eight hours of Chemistry electives from the choices below. Note: This concentration requires 18 hours of study.
- **Forensic Chemistry (18 hours):** Math 201 or Psychology 201; Chemistry 151, 408; Chemistry 351 or 4 hours of Chemistry electives from the choices below; and two courses from Psychology 315, Sociology 233, or Sociology 314.
- **Physical Chemistry:** Chemistry 441, 445 and six hours of Chemistry electives from the choices below.
- **Synthetic Chemistry:** Chemistry 453, 458 and six hours of Chemistry electives from the choices below.

Chemistry Electives: Chemistry 351, 352, 441, 445, 453, 458, 463, and 466.

Major-Related requirements (23 hours):

Computer Science 141 or 155; Mathematics 161, 162, and 261; and Physics 101-102 or 121-122.

Courses that count in the Chemistry major quality point average (MQPA):

All courses with "CHEM" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Science Degree in Chemistry Secondary Education Certification—102 hours

Chemistry Core (38 hours):

Chemistry 111, 112, 113, 114, 227, 231, 235, 241, 242, 345, 346, 351, 402, and 488.

Major-Related requirements (24 hours):

Mathematics 161, 162, and 261; Physics 101-102 or 121-122; and Science 202.

Education requirements (40 hours):

Education 202*, 203, 204, 215, 317, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Chemistry Secondary Education Certification major quality point average (MQPA):

All courses with "CHEM" and "EDUC" prefixes, PSYC 102, and SEDU 101. A minimum MQPA of 2.00 is required to graduate. Students should see the Department of Education's section of the *Bulletin* for more details on teacher certification requirements.

Course Requirements for a Bachelor of Science Degree in Chemistry and General Science Secondary Education Certification—108-109 hours

Chemistry Core (38 hours):

Chemistry 111, 112, 113, 114, 227, 231, 235, 241, 242, 345, 346, 351, 402, and 488.

Major-Related requirements (30-31 hours):

Astronomy 206 or 207; Geology 201 or Science 204; Mathematics 161, 162, and 261; Physics 101-102 or 121-122; and Science 202.

Education requirements (40 hours):

Education 202*, 203, 204, 215, 317, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Chemistry and General Science Secondary Education Certification major quality point average (MQPA):

All courses with "CHEM" and "EDUC" prefixes; ASTR 206 and 207; GEOL 201; SCIC 202, 204; PSYC 102; and SEDU 102 and 103. A minimum MQPA of 2.00 is required to graduate. Students should see the Department of Education's section of the *Bulletin* for more details on teacher certification requirements.

Course Requirements for Bachelor of Science Degree in Biochemistry—74 hours

Biochemistry Core (55 hours):

Chemistry 111, 112, 113, 114, 227, 231, 235, 241, 242, 342, 351, 352, 451, 487; Biology 101, 102, 233, and 234.

Major-Related requirements (19 hours):

Mathematics 161, 162; Physics 121-122 or 101-102; and Psychology 201.

Courses that count in the Biochemistry major quality point average (MQPA):

All courses with "CHEM" and "BIOL" prefixes. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a concentration in Chemical Synthesis (8 hours)

Students majoring in Biochemistry can earn a concentration in Chemical Synthesis by completing Chemistry 422, 431, 453, and 458.

Course Requirements for a concentration in Forensic Chemistry (11 hours)

Students majoring in Biochemistry can earn a concentration in Forensic Chemistry by completing Chemistry 151, 408, and two courses from Psychology 315, Sociology 233, or Sociology 314.

Course Requirements for a concentration in Health (11-12 hours)

Students majoring in Biochemistry can earn a concentration in Health by completing Biology 341 or 346; Biology 407; and one of Biology 313, 314, 325, 341, or 346.

Course Requirements for a minor in Chemistry (24 hours)

A minor in Chemistry will consist of Chemistry 111 and 113, or 105; Chemistry 112 and 114; Chemistry 227 and 241; and eight hours from Chemistry 231, 242, 245, 342, 345, 346, 406, or 431.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

CHEMISTRY (CHEM)

CHEM 105. CHEMISTRY FOR ENGINEERS. An introductory survey in the fundamental principles of chemistry, including chemical reactions and equations; behavior of gases; chemical thermodynamics; basics of electrochemistry; crystal structure; and nuclear, organic, and environmental chemical fundamentals. Students who have earned credit for Chemistry 105 may not subsequently receive credit for Chemistry 111 or 113. Three lectures and one lab per week.*Fall semester only, four hours.*

CHEM 111. GENERAL CHEMISTRY I. The first semester of a year-long introduction to the fundamental principles of chemistry, including stoichiometry, nomenclature, basic reactions (solubility, acid-base and oxidation reduction), gas laws, Laws of Thermodynamics (enthalpy, entropy, Gibb's free energy and equilibrium constant), electronic structure, bonding, molecular structure, properties of pure liquids and solids, and solutions. Three lectures per week. No credit will be given to students who have already received credit for Chemistry 105. *Fall semester only, three hours.*

CHEM 112. GENERAL CHEMISTRY II. The completion of the introductory survey of the fundamental principles of chemistry which begins in Chemistry 111. Topics covered include concepts and theories of rates of reaction, chemical equilibrium, aqueous equilibria, electrochemistry, coordination chemistry, nuclear chemistry, descriptive main group chemistry, and an introduction to organic chemistry. Three lectures per week. Prerequisite: Chemistry 111 or 105.

Spring semester only, three hours.

CHEM 113. GENERAL CHEMISTRY LAB I. This course will develop laboratory skills in measurement, use of volumetric glassware and titration. Students will learn to use visible spectrometers, calorimeters, and data probes to record results on their computers. They will be exposed first-hand to concepts in CHEM 111 like solubility, acid-base neutralization, gas laws and colligative properties. Pre- or Co-requisite: Chemistry 111. *Fall semester only, one hour*

CHEM 114. GENERAL CHEMISTRY LAB II. Students will continue to refine lab skills begun to develop in Chemistry 113. They will be exposed first-hand to concepts from Chemistry 112 including kinetics, acid-base behavior, electrochemistry and enthalpy of reaction. A working knowledge of the following instruments will also be expected by the end of the semester: bench top GC, pH data probes, digital multimeter and Spectronic 20. Prerequisite: Chemistry 113. Pre- or Co-requisite: Chemistry 112. *Spring semester only, one hour.*

CHEM 151. INTRODUCTION TO FORENSIC SCIENCE. This course provides an overview of the field of forensic science and will cover scientific principles and their application in the analysis of crime scene evidence. Topics covered will include glass and soil, microscopy, bloodstains, hair, fibers fingerprinting and firearms. Three lectures per week. *Alternate years, fall semester only, three hours.*

CHEM 190. STUDIES IN CHEMISTRY. This course is used to present various introductory topics in chemistry. *Semester course, one to three hours.*

CHEM 227. ANALYTICAL CHEMISTRY. A study of the theoretical basis and laboratory techniques necessary for the solution of problems in quantitative chemical analysis. Three lectures and one lab per week. Prerequisite: Chemistry 112 and 114. *Fall semester only, four hours.*

CHEM 231. DESCRIPTIVE INORGANIC/BIOINORGANIC CHEMISTRY. A survey of descriptive inorganic and bioinorganic chemistry. The course is designed to give students an introduction to main group inorganic chemistry, bioinorganic chemistry, and molecular symmetry/group theory. Two lectures per week. Prerequisite: Chemistry 112 and 114, or 105. *Spring semester only, two hours.*

CHEM 235. CHEMISTRY IN CONTEXT. Building on the foundation of General Chemistry, topics include current issues in chemistry, research and career opportunities, ethics and the integration of the Christian faith, researching the chemical literature and an introduction to modern instrumentation. This course fulfills the Information Literacy (IL) requirement for majors in the Department of Chemistry. Prerequisite: Chemistry 112 and 114. *Fall semester only, one hour.*

CHEM 241. ORGANIC CHEMISTRY I. An introduction to the structure and chemistry of carbon compounds including alkanes, stereochemistry, haloalkanes, alcohols, ethers and alkenes. Structure determination by spectroscopic methods is introduced. Three lectures and one lab per week. Prerequisite: Chemistry 112 and 114. *Fall semester only, four hours.*

CHEM 242. ORGANIC CHEMISTRY II. A continued study in the chemistry of organic compounds including alkynes, conjugated systems, aromatic compounds, aldehydes and ketones, carboxylic acids and their derivatives, amines and biological molecules. Structure determination by spectroscopic methods is emphasized. Three lectures and one lab per week. Prerequisite: Chemistry 241. *Spring semester only, four hours.*

CHEM 245. INTRODUCTION TO MOLECULAR MODELING. An introduction to the application of molecular modeling to the structure, reactivity and spectra of molecules. The focus will be on what can be accomplished using presently available computational chemistry programs and how to use the programs to accomplish these tasks. The theoretical background of the techniques and algorithms is treated from a user's perspective, emphasizing practical impacts of various choices the user can make in choosing methodology. Students apply the techniques covered in class to small chemical systems and compare results of various approximations. Two lectures per week. Prerequisites: Chemistry 241 and Mathematics 161. *Spring semester only, two hours.*

CHEM 260. INDEPENDENT STUDY. Individual study of specialized topics in chemistry. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

CHEM 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in chemistry. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

CHEM 330. INTRODUCTION TO CLINICAL MEDICNE. This course introduces the practice of clinical medicine by practicing physicians, integrating studies in biology, chemistry, mathematics, and physics in application to a future health career. Students will learn how to take basic medical histories, perform a general physical examination, and begin to develop differential diagnoses for various disease processes. The course will examine clinical medicine through a detailed examination of the body's major systems including the cardiovascular, pulmonary, musculoskeletal, gastrointestinal, nervous, and hematological systems. Prerequisites: Chemistry, Biology or Exercise Science majors with junior or senior standing or by permission of instructor. One evening per week.
Fall semester only, one hour.

CHEM 342. PHYSICAL CHEMISTRY OF BIOLOGICAL SYSTEMS. An overview of physical chemistry with particular application to life sciences. Topics include thermodynamics, equilibrium, kinetics, molecular motion, molecular spectroscopy, molecular structure and modeling. Three lectures and one lab per week. Prerequisites: Chemistry 241 and Mathematics 162.
Spring semester only, four hours.

CHEM 345. MICROSCOPIC PHYSICAL CHEMISTRY: QUANTUM MECHANICS AND SPECTROSCOPY. An introduction to the principles of quantum mechanics and their application in describing molecular properties. An emphasis is placed on developing a solid understanding of the principles of spectroscopy and electronic structure. Three lectures and one lab per week. Prerequisites: Chemistry 231 and Mathematics 261. *Fall semester only, four hours.*

CHEM 346. MACROSCOPIC PHYSICAL CHEMISTRY: STATISTICAL MECHANICS, THERMODYNAMICS, AND KINETICS. The relationships between the properties of macroscopic systems are developed to gain an understanding of chemical equilibrium. The principles of statistical mechanics are introduced to show how thermodynamic properties can be predicted from molecular properties described by quantum mechanics. Connections are developed between chemical kinetics and reaction mechanisms. Three lectures and one lab per week. Prerequisites: Chemistry 112 and 114, or 105; and Mathematics 261. *Spring semester only, four hours.*

CHEM 351. BIOCHEMISTRY I. An introduction to the molecular forces, equilibria and macromolecules that comprise living organisms. Emphasis is placed on proteins as the enzymatic catalysts of metabolism and the central role of carbohydrates in intermediary metabolism. Three lectures and one lab per week. Prerequisite: Chemistry 242. *Fall semester only, four hours.*

CHEM 352. BIOCHEMISTRY II. A continued study of the molecular forces, equilibria and macromolecules that comprise living organisms. Emphasis is on the structures and biological roles of lipids, proteins and nucleic acids. There is also a focus on experimental methods and related molecular technologies. Three lectures and one lab per week. Prerequisite: Chemistry 351.
Spring semester only, four hours.

CHEM 360. INDEPENDENT STUDY. Individual study of specialized topics in chemistry. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

CHEM 370. INDEPENDENT RESEARCH. Juniors who have displayed aptitude in chemistry perform assigned research problems. This course may not be taken concurrently with Chemistry 499. Three hours of laboratory work per week per credit hour. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one or two hours.*

CHEM 390. STUDIES IN CHEMISTRY. This course is used to present various advanced topics in chemistry. *Semester course, one to three hours.*

CHEM 402. TECHNIQUES IN CHEMISTRY CLASSROOM AND LABORATORY INSTRUCTION. A course limited to Chemistry Secondary Education (CSED) and General Science Secondary Education (CGSE) majors involving instruction and experience in setting up and conducting effective educational chemistry demonstrations and laboratories. Students will also gain experience in scientific lecture preparation, including multiple lecture opportunities both in the classroom and laboratory settings. Prerequisites: Chemistry 227 and 241.
Alternate years, fall semester only, two hours.

CHEM 406. INSTRUMENTAL ANALYSIS. A course focused on instrumental theory, methods and design, and the application of modern instrumentation in chemical analysis. Two lectures and two labs per week. Prerequisite: Chemistry 227; Recommended: Chemistry 346.
Spring semester only, four hours.

CHEM 408. FORENSIC CHEMISTRY. This course will provide students exposure to the processing and analysis of forensic samples. Students will learn how to quantitatively analyze sample collections used as evidence in the crime lab, structure and organize lab reports and interpret data to be used for evidence. In addition, analytical methods including chromatography, mass spectroscopy, absorbance spectroscopy, fingerprint identification and microscopy used in forensic applications will be covered. One lecture and 4-hour lab per week. Prerequisite: Chemistry 227. Corequisite Chemistry 406. *Alternate years, spring semester only, two hours.*

CHEM 422 INORGANIC SYNTHESIS LABORATORY. This course involves the synthesis and physical characterization of inorganic and organometallic compounds of main group and transition metal compounds. Two labs per week. Prerequisites: Chemistry 231 and 242; Corequisite: Chemistry 431. *Fall semester only, two hours.*

CHEM 428. ORGANOMETALLIC CHEMISTRY. A study of the synthesis and properties of organometallic compounds and their role in modern catalytic processes. The rapidly growing areas of bioinorganic and bioorganometallic chemistry is discussed. Three lectures per week. Prerequisite: Chemistry 421. *Offered infrequently, three hours.*

CHEM 431. ADVANCED INORGANIC/ORGANOMETALLIC CHEMISTRY. An in-depth study of transition metal chemistry. The relationships between the symmetry of molecules and their physical and chemical properties will be explored, as well as the role that organometallic compounds play in modern catalytic processes. Two lectures per week. Prerequisites: Chemistry 231; and Chemistry 342 or 345. *Fall semester only, two hours.*

CHEM 441. CRYSTAL STRUCTURE ANALYSIS. An introduction to the principles of x-ray crystallography. Theory of x-ray diffraction will be covered in addition to instruction on selecting, mounting, analyzing, refining and determining structures of various crystals. Students will learn to operate a bench-top x-ray instrument and become proficient with the operational and analysis software. Prerequisite: Chemistry 231. *Alternate years, fall semester only, two hours.*

CHEM 445. ADVANCED COMPUTATIONAL CHEMISTRY. Computational chemistry methods are used today in such diverse fields as neuroscience, pharmaceuticals, interstellar chemistry, and catalysis. This course will build upon the introduction to molecular modeling presented in Chemistry 245 and focus on *ab initio* methods of calculating properties and interactions of small molecules to solve chemical problems. Practical use of commercial software will constitute a major component of the students' assessment. Two lectures per week. Prerequisite: Chemistry 245 and Corequisite: Chemistry 345; or Prerequisite: Chemistry 245, 342, and Mathematics 162.
Alternate year, Spring semester only, two hours.

CHEM 451. BIOCHEMISTRY: DATA AND ANALYSIS. A continued study of the macromolecules of living systems, their structures and the methods used to elucidate those structures. Emphasis is placed on the generation, analysis and presentation of data from a variety of experimental approaches with special consideration given to the unifying theme of computer aided data analysis. Three lectures per week. Prerequisite: Chemistry 352. *Fall semester only, three hours.*

CHEM 453. ADVANCED MOLECULAR SPECTROSCOPY. A study in modern spectral analysis for the determination of molecular structure, including advanced topics involving mass spectrometry, infrared spectrometry, and multiple pulse NMR techniques such as 2-dimensional NMR. Two lectures per week. Prerequisite: Chemistry 242. *Spring semester only, two hours.*

CHEM 458. ADVANCED SYNTHESIS LABORATORY. This course is designed to give the student a broad range of advanced synthetic laboratory experiences. The course covers the synthesis of a wide range of organic, inorganic, and organometallic compounds involving specialized techniques typical of a research environment. Two labs per week. Prerequisite: Chemistry 242.
Spring semester only, two hours.

CHEM 460. INDEPENDENT STUDY. Individual study of specialized topics in chemistry. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

CHEM 463. POLYMER CHEMISTRY. An introduction to the structure, synthesis, and physical properties of the major organic polymers. Two lectures per week. Prerequisite: Chemistry 242.
Fall semester only, two hours.

CHEM 466. ADVANCED ORGANIC CHEMISTRY. A detailed study of organic reactive intermediates and organic reaction mechanisms. Two lectures per week. Prerequisite: Chemistry 242.
Alternate spring semesters, two hours.

CHEM 470. INDEPENDENT RESEARCH. Seniors who have displayed aptitude in chemistry perform assigned research problems. This course may not be taken concurrently with Chemistry 499. Three hours of laboratory work per week per credit hour. Prerequisite: Chemistry 370, permission of the department chair, and a faculty sponsor are required. *Semester course, one or two hours.*

CHEM 471. COMPUTATONAL CHEMISTRY PROJECT. This course serves as the capstone to the computational modeling concentration in the chemistry major. A student will design and complete a computational chemistry project under the supervision of a faculty member. Prerequisites: Chemistry 245, 345, and Computer Science 141. *Offered periodically as needed, one or two hours.*

CHEM 480. INTERNSHIP IN CHEMISTRY. Selected students participate in an individual field experiences in a research laboratory under the supervision of professional staff. Minimum two weeks work required per intern credit hour. The grade is determined on the basis of a written evaluation by the cooperating institution mentor and a written report by the student submitted to the Chemistry Department. Prerequisites: Minimum 24 hours in chemistry and permission of the department.
Semester course, one to six hours.

CHEM 487. BIOCHEMISTRY SEMINAR. This course includes faculty directed reading, analysis, and discussion of the biochemical literature. The course also involves in-depth research, written paper, and oral presentation of an approved topic selected by the student. Senior status in the department required for enrollment. This course fulfills the Writing Intensive (WI) and Speaking Intensive (SI) requirements for the Biochemistry major. *Spring semester only, one hour.*

CHEM 488. CHEMISTRY SEMINAR. This course includes faculty directed reading, analysis, and discussion of the chemical literature. The course also involves in-depth research, written paper, and oral presentation of an approved topic selected by the student. Senior status in the department required for enrollment. This course fulfills the Writing Intensive (WI) and Speaking Intensive (SI) requirements for majors in the Department of Chemistry. *Fall semester only, one hour.*

CHEM 499. HONORS IN CHEMICAL RESEARCH. Seniors who have shown special aptitude in chemistry may, with consent of the Department of Chemistry, undertake supervised chemistry research. Not to exceed two hours each semester. *Semester course, one or two hours.*

DEPARTMENT OF COMMUNICATION AND VISUAL ARTS

Dr. Miller, Chair; Mr. Mucha, Director of Design and Visual Arts; Mr. Bandy, Ms. Barrios. Additional Instructional Faculty: Mr. Catanese, Mr. Hammond, Mrs. Pritchard, Mr. Sanders.

Course Requirements for Bachelor of Arts Degree in Communication Arts—36 hours

Communication Arts Core (15 hours):

Communication Arts 104 or 109 (total of three hours), 135, 212, 215, and 225.

Communication Arts Electives (21 hours):

Media & Design (6 hours):

Two courses from Communication Arts 245, 277, 359, 378, 388, Design 101, 102, 201, or 210.

Culture & Theory (6 hours):

Two courses from Communication Arts 222, 240, 250, 304, 352, 362, 444, 427.

Professional & Technical (6 hours):

Two courses from Communication Arts 235, 300, 303, 305, 405, 406, 459, or Art 320.

Capstone Elective (3 hours):

Choose three hours from Communication Arts 470, 480, 488, or 499.

Courses that count in the Communication Arts major quality point average (MQPA):

All courses with "COMM" prefix. A minimum MQPA of 2.00 is required to graduate.

Recommended Electives:

The required courses and electives provide the graduating student a strong foundation for a career in professional communication, graduate study in communication, or more effective performance in the career of his/her choice. Additional recommendations include two-years of language study at the college level and a minor in an area of interest including Design, English, Entrepreneurship, International Business, International Studies, Management, Marketing, Psychology, Sociology, or Theatre. Students are encouraged to discuss their vocational interests with their advisors so they can design a tailored plan for their program of study.

Course Requirements for Bachelor of Science Degree in Design and Innovation—63 hours

Design and Innovation Core (36 hours):

Design 101, 102, 201, 202, 207, 210, 301; Communication Arts 135; Entrepreneurship 101, 104, 201; and Marketing 104.

Design and Innovation Major Electives (27 hours):

Communication Arts Electives (9 hours):

Choose three courses from Communication Arts 104, 303, 406, 470, 480, or any 300- or 400-level Communication Arts courses.

Entrepreneurship Electives (9 hours):

Choose three courses from Entrepreneurship 309, 328, 330, 409, 470, 480, or any 300- or 400-level Entrepreneurship courses.

Marketing Electives (6 hours):

Choose two courses from Marketing 415, 417, 419, or 420.

Capstone Elective (3 hours):

Choose one course from Design 401 or 480.

Courses that count in the Design and Innovation major quality point average (MQPA):
All courses with "DESI", "COMM", "ENTR", and "MARK" prefix. A minimum MQPA of 2.00 is required to graduate.

The faculty in the Department of Communication and Visual Arts is committed to providing the opportunities Communication Arts majors and other students need to excel in oral, written, and visual communication. For success in today's society, information literacy is also a critical skill. To these ends, Communication Arts 104 is designated as a Speaking Intensive (SI) course; Communication Arts 212 and Communication Arts 427 are designed as Writing Intensive (WI) courses; and Communication Arts 212 address the key issues involved with Information Literary (IL) and are designated as such. These courses include learning experiences that are designed to prepare Communication Arts majors to be effective and ethical producers and consumers of knowledge.

SUPPORTING ACTIVITIES

The Department of Communication and Visual Arts offers students significant co-curricular activities, including:

- The Speech and Debate Team, which participates in both individual events and group debate.
- American Institute of Graphic Arts (AIGA) student group.
- Involvement with *The Collegian* (campus newspaper), WSAJ (radio station), *The Echo* (literary magazine), *The Quad* (quarterly magazine), *The Bridge* (yearbook), or the College's Office of Marketing and Communications.
- Internships, whereby students earn academic credit for work done in conjunction with a professional organization related to communication (e.g., local newspaper, radio, or television station). See the course description for Communication Arts 480.

Course Requirements for a minor in Communication Arts (18 hours)
A minor in Communication Arts will consist of Communication Arts 104 or 109 (total of 3 hours); one theory course from Communication Arts 215, 222, 304, or 305; and 12 additional hours from any courses with COMM prefix. The one credit course, Theatre 259, may be repeated, and a maximum of three hours may count toward the minor. A Communication Internship (Communication Arts 480) may not count as an elective course toward the minor.

Course Requirements for a minor in Design (21 hours)
A minor in Design will consist of Design 101, 102, 201, 202; Design 220 or Art 202; and two courses from Art 101, 105, 121, Design 110, 207, 210, 301, 390, 401, Communication Arts 212, 245, 277, or 378.

Course Requirements for a minor in Studio Art (21 hours)
A minor in Studio Art will consist of one 2D Art course from Art 101, 105 or 121; one 3D Art course from Art 103, 104 or 111; one Art History course from Art 201 or 202; and 12 additional hours from Art 101, 103, 104, 105, 111, 121, 201, 202, 207, 208, 290, 320, 390, Design 101, 102, or 210.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

COMMUNICATION ARTS (COMM)

COMM 104. PUBLIC SPEAKING AND RHETORIC. Introduces students to the preparation and presentation of material for a variety of public speaking situations. This performance-oriented class offers instruction in the theory of rhetoric, material development, and delivery techniques. Students will review the historical importance of oral communication and the role it plays in society. This course fulfills the Speaking Intensive (SI) requirement for Communication Arts majors.
Semester course, three hours.

COMM 109. FORENSICS. A skills-based course designed to improve students' ability to analyze ideas, advocate ideas in individual debate, and to prepare and deliver oral communications. Students will develop and refine their ability to research, organize, and present orally ideas in the form of informative, critical, and persuasive speeches, Lincoln-Douglas style debates, or individual performances of literature in the form of oral interpretation of literature. May be taken up to three times. *Semester course, one hour.*

COMM 135. WRITING FOR THE MEDIA. Provides an introduction to the substance, structure, and style of multiple forms of non-narrative mass media including print, broadcast, film, and the Internet. *Semester course, three hours.*

COMM 212. RESEARCH METHODS IN COMMUNICATION. Examines the fundamentals of research approaches and methods in communication studies, both qualitative and quantitative. The course also examines a variety of actual communication research studies across the breadth of the field from interpersonal to mass communication. Students will learn questionnaire design and interviewing techniques. This course, along with Communication 427, fulfills the Writing Intensive (WI) requirement, fulfills the Information Literacy (IL) requirement for Communication Arts majors. Prerequisite: Communication Arts 215. *Semester course, three hours.*

COMM 215. PRINCIPLES OF MEDIA. This course offers an introduction of the historical and conceptual foundations of media, including oral, print, photographic, broadcast, cinematic, and digital cultural forms and practices. Drawing upon a comparative approach, students will examine the nature of mediated communication, the functions of media, and the history of transformations in media and the institutions that help define media's place in society. *Semester course, three hours.*

COMM 222. FILM HISTORY AND THEORY. Encompasses the history of the motion picture from its invention in 1895 to the present day, focusing on American film. Introduction to film theories and criticism including principles of aesthetics and the art of how a film is created, from concept to completion. *Semester course, three hours.*

COMM 224. MEDIA, RELIGION AND DEMOCRACY. Explores a variety of questions and problems related to the mass media in a democracy. Questions related to media control, government regulation of media, political economy, journalistic "objectivity", and the advertising-editorial dichotomy are included. Christian reactions and religious activism related to the media are discussed. Chomsky, Herman, McChesney, Postman and other critical theorists are studied.
Semester course, three hours.

COMM 225. INTERCULTURAL COMMUNICATION. Provides an overview of the study of communication and culture. Course content focuses primarily on the theory and practice of communication in intercultural contexts. Students will examine cross-cultural communication (communication across cultures) and intercultural communication (communication between members of different cultures). This course is especially suited to students whose future careers may involve travel overseas or business with non-native Americans. *Semester course, three hours.*

COMM 235. JOURNALISM. Reviews a variety of print and broadcast media, exploring editorial style and slant. Fundamental newsgathering and news writing skills will be studied and practiced. Students will gather information from campus, community, and research sources in order to develop

hard news, feature, and in-depth stories. Ethical and legal issues will be explored as well as the role of print media in shaping current events. *Semester course, three hours.*

COMM 240. MEDIA CRITICISM. An introduction to theoretical approaches and practices used to analyze the content, structure, and context of media in society. Primary attention will be paid to how the fundamental elements of media combine to create meaning and tell stories, the forms media texts make, and the way these structures influence viewers/listeners/users. The course will also explore what media is and why various media forms have developed in certain ways through history and across nations. Students will understand, analyze, and apply a working knowledge of terms and concepts underlying contemporary media studies, the economic, social, and political impact of the media industries, and the aesthetic and ethical implications of the media. *Semester course, three hours.*

COMM 245. DIGITAL PHOTOGRAPHY. This course will cover foundational photography principles in the context of how the art and techniques of photography now come together through the tools of the camera, the computer and industry-standard software. Students will work and be guided through assigned projects with digital cameras and systems to learn how to leverage emerging technologies of imagery. *Semester course, three hours.*

COMM 250. DIGITAL CITIZENSHIP. To be a digital citizen in today's global village one must know how to navigate the various online venues and be tuned into the ethical behavior governing their use. This course will use hands-on learning, discussion and reading to explore this digital world. Students will create blogs, wikis, avatars, podcasts, upload photos to Flickr and learn about tagging in sites like De.li.cious. Students will ponder the sociological impact of this Internet world and explore their own reactions to it by being actively involved in it. Prerequisite: Communication Arts 110. *Semester course, three hours.*

COMM 260. INDEPENDENT STUDY. Individual study of specialized topics in communication studies. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMM 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in communication studies. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMM 272. DEVELOPING CHARACTERS. A creative writing course that will allow students to develop character backstory and explore the impact of character psychology on action and in dialogue. Concepts will enhance character development for film scripts, short stories, novels, and more. Students may only receive credit for one of Communication Arts 272 or Writing 272. *Semester course, three hours.*

COMM 277. AUDIO PRODUCTION. Reviews the basics of audio production for recording. A particular emphasis is placed on the medium of radio including web casting. Consideration will be given to the history of radio broadcasting; properties of sound; microphone types; recording and control room techniques; and computerized editing of audio materials. Students will undertake a variety of practical projects in public affairs, news, sports, remote, music, and drama programming with opportunity for airing quality work on the College radio station. *Semester course, three hours.*

COMM 290. STUDIES IN COMMUNICATION. Intensive examination of an area of communication not fully covered by regular departmental offerings. Subject matter varies each semester. *Offered periodically, semester course, one, two or three hours.*

COMM 300. PUBLIC RELATIONS. Focuses on public relations theory, strategy, and techniques. The course emphasizes writing and developing public relations campaigns; theories of public persuasion; legal and ethical considerations; and crisis management and related issues. Students will develop a portfolio for a campus or community organization which will include: an overall campaign plan, news releases, a brochure, a speech, a print advertisement, a radio advertisement, and a final campaign presentation. Prerequisite: Communication Arts 135 or 235 recommended.
S*emester course, three hours.*

COMM 303. PROFESSIONAL COMMUNICATION. Focuses on speaking and writing tools most often used by business professionals. Presentational speaking, personal communicative development, professional communication, and interviewing will be emphasized. Issues that relate to professional success will be explored. Must have junior or senior standing. *Semester course, three hours.*

COMM 304. INTERPERSONAL COMMUNICATION. This course examines the fundamental principles of effective interpersonal communication. Students are given the opportunity to work in experiential learning groups and to reflect on effective and ineffective interpersonal communication processes. Effective interpersonal communication is a critical component of competent and ethical decision-making. Emphasizing a relational view of communication – one that explores how relationships are created, negotiated, maintained, and in some cases terminated – this course is designed with a dual approach consisting of both theory and application that allows for the opportunity to critically analyze and evaluate the intricacies of interpersonal relationships in various contexts. Prerequisites: Communication Arts 207 or permission of instructor. *Semester course, three hours.*

COMM 305. PERSUASION THEORY. Explores a variety of media to ascertain the persuasive messages inherent in each genre. The course will familiarize the students with the processes of persuasion, methods of studying persuasion, the theories of persuasion, and ethical concerns about persuasion. The perspectives and tools developed should enable the student to develop effective message strategies in both professional and personal life. An excellent course for pre-professional majors and students involved in speech and debate. This course, along with Communication 104, 207, 212, and 427, fulfills the Information Literacy (IL) requirement for Communication Arts majors. Prerequisite: Communication Arts 207 or permission of instructor. *Semester course, three hours.*

COMM 352. CHRISTIAN FAITH AND CINEMA. A survey of films, both the decidedly Christian and decidedly secular. The student will consider the importance of a film's theme in deciding its worth, criteria by which they can choose valuable films to watch, and will evaluate secular films through a Christian perspective. The student will also learn what it means to possess a Biblical worldview and how "other" worldviews permeate popular cinema. *Semester course, three hours.*

COMM 359. SCREENWRITING. This course is an introductory course for screenwriters. Topics of study will include character development, plot structure, storytelling techniques in film, as well as the narrative structure. Students will study films and screenplays as they learn to recognize various elements mentioned previously in feature films. Additionally, students will learn to craft their own stories for the screen. Students may only receive credit for one of Communication Arts 359 or Writing 359. *Semester course, three hours.*

COMM 360. INDEPENDENT STUDY. Opportunities for students with extensive background in communication studies to do intensive independent study or research on specialized topics. Sophomore or higher standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

COMM 362. MEDIA LAW AND ETHICS. Reviews relevant communication and media law and addresses a variety of communication-related ethical issues such as: libel, privacy, copyright, newsgathering rights, etc. *Semester course, three hours.*

COMM 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in communication studies. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMM 378. VIDEO PRODUCTION. An introduction to broadcasting history, media aesthetics, and the technology and practice of multimedia production. Lectures, tutorials, and hands-on experience with cameras, microphones, lighting, and computer-based video editing will provide the basis for further study and internships in this influential medium of mass communication.

Semester course, three hours.

COMM 388. DOCUMENTARY FILM. Encompasses the history and theory of the documentary film genre in motion pictures and television, from the earliest cinematic experiments to the present. The course examines various roles the documentary plays, such as explorer, reporter, painter, advocate, poet, catalyst, and guerrilla. Students will learn basics of visual literacy and will storyboard and shoot their own documentary using computerized video editing systems. Prerequisite: Communication Arts 378. *Semester course, three hours.*

COMM 390. STUDIES IN COMMUNICATION. Intensive examination of areas of communication not fully covered by regular departmental offerings. Subject matter varies each semester.

Offered periodically, semester course, one, two, or three hours.

COMM 405. SPECIAL EVENTS AND PROMOTIONS. This course offers an introduction to the principles and practices relevant to successful event planning. The course content will explore a variety of topic areas such as social and cultural phenomenon of special events, site selection, program planning, budgeting and sponsorships, vendor and volunteer staff management, and publicity. Through the process of researching, planning, coordinating, and evaluating events, students will learn how to design and execute events, meetings, conferences, and conventions for a variety of organizations including trade and professional associations, non-profit organizations, and corporations. Students may (under the direction of the instructor) opt to take this course a second time ONLY IF they actively participate as a leader in a new/ different role than in previous semester. Prerequisites: Junior or senior standing, or permission of instructor. *Semester course, three hours.*

COMM 406. SOCIAL MEDIA WRITING. This course will explore a variety of social media writing experiences. Solid writing practices will be defined (grammar, structure, research), followed by practical experiential learning where students will write for a variety of online platforms. Students will complete the course with a solid foundation on which to build careers in numerous areas- marketing, writing, and production, among others. While specific platforms will be explored, it is a distinct aim of the course to give students the tools they need to write for existing social media as well as new and emerging media. Prerequisite: Junior or senior standing, or permission of instructor.

Online only, three hours.

COMM 427. RHETORICAL CRITICISM. This course is required for Communication Arts majors. Students study a variety of rhetorical-critical methodologies including metaphoric, pentadic, cluster, narrative, fantasy theme, and ideological approaches. Students engage in rhetorical criticism throughout the term. The final project is an original rhetorical critique of a significant text for submission to a professional conference or publication. This course, along with Communication 212, fulfills the Writing Intensive (WI) requirement, for Communication Arts majors. Prerequisites: Communication Arts 207 and 212; and senior status or permission of instructor.

Semester course, three hours.

COMM 444. ADVANCED FILM THEORY. A deeper look at the medium of motion pictures from the point of view of film theorists including semiotics; realism; expressionism; *auteur* theory; cinema as art; montage; film as narrative; literature and adaptations to the screen; documentary and propaganda approaches; genre conventions; psychology; sociology; mythology; and ideology.

Alternate years, semester course, three hours.

COMM 459. ORGANIZATIONAL COMMUNICATION. Provides a critical exploration of organizational communication theory, research, and application. This course examines the factors involved in the functioning and analysis of complex organizations, particularly the direct and indirect ways in which communication processes and social dynamics affect organizations and employee interaction. *Semester course, three hours.*

COMM 460. INDEPENDENT STUDY. Opportunities for students with extensive background in communication studies to do intensive independent study or research on specialized topics. Sophomore or higher standing, permission of the department chair, and a faculty sponsor are required.
S*emester course, one, two or three hours.*

COMM 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in communication studies. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMM 480. INTERNSHIP IN COMMUNICATION. Students may, with consent of the department, earn academic credit for work done in a communication-related organization (e.g., newspaper; radio or television station; public relations office; business; etc.). Students must arrange for a faculty advisor, contact the organization where work will be done, keep a daily log of activities, and write a final paper summarizing the internship. Students must work 60 contact hours for each academic credit earned. Sophomore or higher standing and permission of the department internship coordinator are required. *Semester course, one to six hours.*

COMM 488. SEMINAR. An advanced course for junior and senior Communication Arts majors to concentrate on specific subject matter to be determined by the instructor. Individual research and extensive oral and written reports are required. *Semester course, three hours.*

COMM 499. HONORS IN COMMUNICATION. The student who chooses to pursue work beyond the basic requirements may do extensive reading in one of the following areas: media studies; organizational communication; public relations; audio and video production; filmmaking; oral interpretation; public address; group communication; and rhetorical or communication theory. Extensive research paper and independent reading required. Prerequisites: Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

DESIGN (DESI)

DESI 101. INTRO TO VISUAL COMMUNICATION DESIGN. This course is an in-depth analysis of design principles and formal concepts that builds fundamental knowledge of design as a visual language and communication tool. Students will learn through practical application using industry-standard software. *Semester course, three hours.*

DESI 102. DESIGN THINKING. Students will investigate essential processes that form the basis for all types of design disciplines including the ability to think divergently, problem solve, and empathize.
Semester course, three hours.

DESI 110. DESIGN SOFTWARE FOR BEGINNERS. Adobe Creative Suite is the industry-standard tool set for virtually every design practitioner. In this class, students learn about Adobe Creative Cloud and how to use Photoshop, Illustrator, and InDesign while integrating them in a logical workflow. *Semester course, three hours.*

DESI 190. STUDIES IN DESIGN. Intensive examination of areas of design not fully covered by regular departmental offerings. Subject matter varies each semester.
Offered periodically, semester course, one, two, or three hours.

DESI 201. VISUAL COMMUNICATION DESIGN I. In this course, students are challenged with complex design problems for both print and digital environments with a particular emphasis on typography and layout. Prerequisite: Design 101. S*emester course, three hours.*

DESI 202. VISUAL COMMUNICATION DESIGN II. This course continues to cultivate skill in applying design principles and tools as students manipulate form and image to create conceptually strong designs and visual systems. Prerequisite: Design 201. *Semester course, three hours.*

DESI 207. WEBSITE DEVELOPMENT FOR DESIGNERS. This is a foundational course in the essential tools and technologies upon which websites are built. It is a course designed for students approaching website development from a design and communication perspective and assumes no prior experience with programming or web development technologies. In this course, students will learn HTML and CSS, and will be able to demonstrate how to structure, style, and publish websites. Prerequisite: Design 101. *Semester course, three hours.*

DESI 210. INTERACTIVE DESIGN. This course introduces students to strategy-based process for planning and designing digital user experiences as well as the essentials of web design using industry-standard software. Prerequisite: Design 101. *Semester course, three hours.*

DESI 220. DESIGN HISTORY. In this course, students will explore the origins of visual communication and its evolution into the professional discipline commonly referred to as "Design". This is an introductory course that provides students with cultural and contextual understanding of various professional design disciplines. Students will spend time studying art and design movements, trends, and key individuals associated with each. *Semester course, three hours.*

DESI 301. VISUAL COMMUNICATION DESIGN III. In this course, students investigate the design of logos, marks, and brands in a variety of scenarios. Students will craft strategies, work with realistic constraints, and consider how a brand communicates across a variety of channels as a system. Prerequisite: Design 201. *Semester course, three hours.*

DESI 390. STUDIES IN DESIGN. Intensive examination of areas of design not fully covered by regular departmental offerings. Subject matter varies each semester.
Offered periodically, semester course, one, two, or three hours.

DESI 401. DESIGN IN PRACTICE. This course introduces students to professional aspects of design such as portfolio preparation and presentation, formulating and pitching design concepts, understanding client needs, and creating professional design documents such as proposals, statements of work, and invoices. Students will also learn about pricing, formatting for project delivery, and how to collaborate with clients. Prerequisite: Design 101 and junior or senior standing.
Semester course, three hours.

DESI 480. INTERNSHIP IN DESIGN. Students may, with consent of the department, earn academic credit for work done in a design-related organization. Students must arrange for a faculty advisor, contact the organization where work will be done, keep a daily log of activities, and write a final paper summarizing the internship. Students must work 60 contact hours for each academic credit earned. Sophomore or higher standing and permission of the department internship coordinator are required.
Semester course, one to six hours.

VISUAL ARTS (ART)

ART 101. ELEMENTS AND PRINCIPLES OF DRAWING. This course introduces students to essential 2D art concepts and techniques using a variety of drawing tools to produce black and white renderings on paper. *Semester course, three hours.*

ART 103. CERAMICS I HANDBUILDING. This is an introductory studio class designed to expose students to a variety of ceramic processes used to produce sculpture and vessel. The goal is to broaden students' understanding of clay as a viable medium for personal visual expression. *An additional fee is charged for this course.* *Semester course, three hours.*

ART 104. CERAMICS I WHEEL. This is an introductory studio class designed to expose students to the potter's wheel and throwing techniques used to produce hand-thrown vessels. The goal is to broaden students' understanding of clay as a viable medium for personal visual expression as they create unique, finished clay. *An additional fee is charged for this course.*
Semester course, three hours.

ART 105 INTRODUCTION TO COLOR THEORY IN PAINTING. This course is an introduction to basic painting techniques and tools including acrylic, oil, and watercolor on a variety of substrates. *Semester course, three hours.*

ART 111. INTRODUCTION TO SCULPTURE. This is an introductory studio class designed to expose students to a variety of sculptural processes and materials used to produce 3D art. *Semester course, three hours.*

ART 121. BEGINNING PRINTMAKING. This course is an introduction to printmaking methods typically used by artists and designers. In addition to understanding techniques, students will be challenged to think practically as they balance the affordances and constraints of various printmaking processes. *An additional fee is charged for this course.* *Semester course, three hours.*

ART 201. HISTORY AND APPRECIATION OF ART I. A survey of the visual arts (including painting, architecture, and sculpture) from prehistory through the High Renaissance, studied through illustrated lectures, readings, and class discussions. Students may take either Art 201 or 202 or both classes, in any order. Prerequisite: Humanities 301. *Semester course, three hours.*

ART 202. HISTORY AND APPRECIATION OF ART II. A survey of the visual arts (including painting, architecture, and sculpture) from Mannerism through the Twentieth Century, studied through illustrated lectures, readings, and class discussions. Students may take either Art 201 or 202 or both classes, in any order. Prerequisite: Humanities 301. *Semester course, three hours.*

ART 207. CERAMICS II. This course is a continuation of the beginning ceramics class where students refine their understanding of the medium. Students are challenged to build a body of work and develop a personal style. *An additional fee is charged for this course.* Prerequisite: Art 103 or 104. *Semester course, three hours.*

ART 208. PUEBLO POTTERY. The primary focus of this course is to increase understanding and appreciation for the Pueblo Indians of the Southwest and their pottery. Students use traditional Pueblo techniques to make tools, process clay, and produce artwork. *Semester course, three hours.*

ART 260. INDEPENDENT STUDY. Individual study of specialized topics in art. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ART 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in art. Sophomore standing, permission of the department chair, and a faculty sponsor are required . *Semester course, one, two or three hours.*

ART 290. STUDIES IN VISUAL ARTS. Typically offered during May Intersession, this travel course features the culture, music, and art of selected areas of Western Europe and is given as credit for those taking the travel interim who have already received credit for Humanities 301: Civilization and the Arts. Course content includes viewing assigned pre-trip documentaries, attending all trip lectures and visits, completing assigned readings, and keeping a directed journal. Trip fees apply. *Intersession course, three hours.*

ART 320. GALLERY STUDIES. This course provides an experience for students who are interested in the arts in fields such as a gallery director, an event planner, as well as those who are interested in pursuing a career as an artist. Students in the course will gain valuable working experiences in planning and executing successful gallery-related events. *Semester course, three hours.*

ART 321. THE USE OF ART IN THE CLASSROOM. A study of materials and methods of instruction in art for the elementary and preschool including topics in the theory and practice of teaching art. Prerequisite: Sophomore standing. *Semester course, one hour.*

ART 360. INDEPENDENT STUDY. Advanced study in an area of art not available through regular course offerings. An independent study form is required to register for this class. Sophomore or higher standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ART 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in art. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ART 390. STUDIES IN VISUAL ARTS. A course that covers special topics in the field of arts.
Offered periodically, semester course, one, two or three hours.

ART 460. INDEPENDENT STUDY. Advanced study in an area of art not available through regular course offerings. An independent study form is required to register for this class. Junior or higher standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ART 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in art. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ART 488. SEMINAR IN ART. Available only by pre-approved permission of the department chair and the instructor involved. *An additional fee is charged for this course.*
Semester course, one, two or three hours.

DEPARTMENT OF COMPUTER SCIENCE

Dr. Wolfe, Chair; Dr. Al Moakar, Dr. M. W. Bright, Dr. Dellinger, Dr. Dickinson, Dr. Hutchins, Dr. H. Zhang. Additional Instructional Faculty: Mr. Carlin.

The Computer Science Department seeks to provide its students with a solid foundation in the field of computing in order to prepare them for employment in an exciting industry or for advanced studies in top-ranked graduate schools. This foundation is built on knowledge of mathematics, programming languages, algorithms and data structures, and theory. In addition, students explore advanced topics, research projects, and technology projects.

The Department believes that it must transmit more than technical expertise to its students: whenever possible, the curriculum emphasizes the need for students to understand their responsibilities to society and to behave ethically, as well as to strengthen and live their Christian faith and witness to the professional community.

Students who complete a Bachelor of Science in Computer Science or a Bachelor of Arts in Computer Science are prepared to use their computer science skills in a variety of jobs or in their graduate education. Students who complete a Bachelor of Science in Data Science are equipped with a combination of mathematics, statistics, computer science, and data science knowledge, as well as knowledge of a particular domain where they can apply data science techniques to solve practical problems. Broadly educated persons with computing skills are in great demand.

No matter what career is pursued, computing professionals must possess the ability to locate, evaluate, and use information. In addition, they must be able to communicate their ideas and conclusions clearly and coherently through the written and spoken word. Instruction in these core communication skills is provided in Computer Science 205, 350, 451, and 452, which cover the Writing Intensive (WI) and Speaking Intensive (SI) requirements and provide partial coverage of the Information Literacy requirement. As a related concern, one of the significant problems in the computer field today is the proper

application of ethics. For this reason, all computer science majors are required to take Computer Science 205 *Ethics, Faith, and the Conscious Mind.*

The Computer Science Department has formulated the following objectives and specific outcomes to guide us in directing and evaluating our program.

Program Educational Objectives

1. Graduates active in the computer science profession will be successful because of strong technical skills, including problem-solving and programming.
2. Graduates active professionally will be successful because of strong communication and team skills.
3. Graduates' behavior will be guided by professional and ethical principles based on Biblical truths and a Christian worldview.

Student Outcomes

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline
3. Communicate effectively in a variety of professional contexts
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline
6. Apply computer science theory and software development fundamentals to produce computing-based solutions (B.S. in Computer Science only)

Computing Facility

The Computer Science department is located in the Science, Technology, Engineering, and Math (STEM) building. Students have exclusive use of two labs designed specifically to help students work collaboratively by utilizing horseshoe-shaped table and display configurations called "pods." Each of the eight pods in a room has a large monitor; students can connect their school-issued laptops to the monitor in order to display to their table or, with faculty permission, to show their work to the rest of class. Students also use the labs outside of class to work on group projects.

In addition, the Department has console-game development stations (e.g. Sony PS4), Apple MacBook computers, iPads, and Android tablets for mobile application development. All of this equipment is available for both class and research use. Microsoft software is available for all department majors, and includes many software products (e.g., professional versions of Visual Studio and the Office Suite). The Department also has dedicated equipment for work in computer security

Course Requirements for Bachelor of Science Degree in Computer Science—89-92 hours

Computer Science Core Requirements (27 hours):

Computer Science 141, 155, 220, 222, 233, 244, 314, 325, and 342.

Advanced Core Requirements (23 hours):

Computer Science 205, 340, 350, 422, 443, 448, 451, and 452.

Computer Science Electives (15 hours):

Choose fifteen hours from Computer Science 390, 401, 402, 435, 441, 442, 445, 446, 447, 475, Data Science 431, 450, or Robotics 302.

Math/Science Core Requirements: (24-27 hours):

Mathematics 161, 162, and 213.

Mathematics 214; or Mathematics 222 and 331.

Choose eight credits from Physics 101; PHYS 102; Chemistry 105 or both Chemistry 111 and 113; Chemistry 112 and 114; Biology 101; or Biology 102. Note: Completing both Chemistry 105 and Chemistry 111/113 will not fulfill this this requirement.

Courses that count in the Bachelor of Science in Computer Science major quality point average (MQPA): All courses with "COMP" prefix, "DSCI" prefix, and MATH 213. A minimum MQPA of 2.00 is required to graduate.

B.S. in COMPUTER SCIENCE MAJOR FOUR-YEAR PLAN

FRESHMAN YEAR	**Fall**	**Spring**	**SOPHOMORE YEAR**	**Fall**	**Spring**
COMP 141 – COMP 220	3	3	COMP 222 – COMP 205	3	3
COMP 155 – MATH 162	3	4	COMP 244 – COMP 233	3	3
MATH 161 – Science Elective	4	4	MATH 213 – COMP 342	4	3
Science Elective – WRIT 101	4	3	HUMA 200 – MATH 214	3	4
HUMA 102 – PHYE 100	3	1	Found. Soc. Sci. – HUMA 202	3	3
	17	15	General Electives	1	
				17	16
JUNIOR YEAR			**SENIOR YEAR**		
COMP 325 – COMP 314	3	3	COMP 448 – COMP 443	3	3
COMP 422 – COMP 340	3	3	COMP 451 – COMP 452	2	3
Comp. Sci. Elec. – COMP 350	3	3	Comp. Sci. Electives	3	3
Comp. Sci. Electives	3	3	HUMA 303 – General Elec.	3	3
HUMA 301 – General Elec.	3	3	General Electives	3	3
General Electives	2	1	General Elective	1	
	17	16		15	15

Note: *Students must work with their advisor during their sophomore year to create a plan for their computer science electives, since some electives are only offered in alternate years and require certain prerequisites.*

Course Requirements for Bachelor of Arts Degree in Computer Science—60-62 hours

Computer Science Core Requirements (35 hours):

Computer Science 141, 155, 205, 220, 222, 233, 244, 325, 340 or 342, 350, 451, and 452.

Computer Science Electives (15 hours):

Choose fifteen hours from any 300-400 level Computer Science, any 300-400 level Data Science courses, and ROBO 302.

Math Requirements: (10-12 hours):

Mathematics 118 or 213.

One of Mathematics 201, 214, 331, Management 201, or Psychology 201.

Mathematics 141 or 161.

Courses that count in the Bachelor of Arts in Computer Science major quality point average (MQPA):

All courses with "COMP" prefix, MATH 118, and MATH 213. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Science Degree in Data Science—67-71 hours

Math and Statistics Requirements (22 hours):

Mathematics 161, 162, 213, 214, Management 202, and one of Management 201, Mathematics 201, or Psychology 201. Note: Students may substitute Mathematics 222 and 331 for Mathematics 214.

Computer Science Requirements (15 hours):

Computer Science 141, 220, 222, 244, and 435.

Data Science Requirements (12 hours):

Data Science 144, 215, 431, and 450.

Technical Elective (3 hours):

Choose one course (3 credits) from Computer 233, 445, Management 212, 310, or 314.

Domain Concentration (15-19 hours):

Complete one of the following concentrations:

Behavioral and Social Sciences (choose focus area from below):

- *Economics*: Economics 101, 102, 120, and six hours from any 300-400 level Economics courses.
- *Exercise Science*: Exercise Science 101, six hours from any 300-400 level Exercise Science courses (excluding EXER 305), and six hours from any additional Exercise Science courses.
- *Political Science*: Political Science 104, 201, one of Political Science 204 or 205, and six hours from any 300-400 level Political Science courses.
- *Psychology*: Psychology 101, six hours from any 300-400 level Psychology courses and six hours from any additional Psychology courses (excluding Psychology 201).
- *Social Work*: Social Work 101, 264, 342, 382, and three hours from any 300-400 level Social Work courses.
- *Sociology*: Sociology 101, 377, 473, and six hours from any 300-400 level Sociology courses.

Business (choose focus area from below):

- *Accounting*: Accounting 201, 202, 301, 321, and 405.
- *Business*: Accounting 201, 202, Finance 301, Management 103, and Marketing 104.
- *Entrepreneurship*: Accounting 201, Entrepreneurship 101, 102, 201, Finance 301, and two hours from any 300-400 level Entrepreneurship courses.
- *Finance*: Accounting 201, 202, Finance 301, 332, 440, and three hours from any 300-400 level Finance courses.
- *Management*: Management 103, 457, 475, and six hours from any 300-400 level Management courses.
- *Marketing*: Management 201, Marketing 104, 315, 411, 415, and 419.

Natural Sciences (choose focus area from below):

- *Biology*: Biology 101, 102, 233, 234, and three hours from any 300-400 level Biology courses.
- *Chemistry*: Chemistry 111 and 113, or 105; 112 and 114, 227, 241, and three hours from any 300-400 level Chemistry courses.
- *Physics*: Physics 101, 102, 135, 234, and three hours from any 300-400 level Physics courses.

Courses that count in the Bachelor of Science Data Science major quality point average (MQPA): All courses with "DSCI" prefix; COMP 141, 220, 222, 244, 435; MATH 161, 162, 213, 214, 222, 331, 201; PSYC 201; MNGT 201, and 202. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a minor in AI and Data Science (22-25 hours)

A minor in Data Science will consist of Data Science 215, 431; Computer Science 435, 445; one of Management 212, 310, 314, or 325; Psychology 201, Mathematics 201, or Management 201; and either Mathematics 214 or both Mathematics 222 and Mathematics 331.

Course Requirements for a minor in Computer Science (18 hours)

A minor in Computer Science will consist of Computer Science 141, 220, 222, and nine additional hours of Computer Science courses 200-level and above.

Course Requirements for a minor in Computer Game Design and Development (18 hours)

A minor in Computer Game Design and Development will consist of Computer Science 441, 446, and 447; Communication Arts 272; Communication Arts 135 or Design 110; Computer Science 401, 402, or 445.

Course Requirements for a minor in Cybersecurity (18 hours)

A minor in Cybersecurity will consist of Computer Science 205, 340, 342, 448, 475, and Sociology 221.

Course Requirements for a minor in High-Tech Entrepreneurship (18 hours)

A minor in High-Tech Entrepreneurship will consist of Computer Science 401, 402, or 442; Computer Science 451 and 452; Entrepreneurship 101 and 301; Entrepreneurship 317 or 409; and Entrepreneurship 360 or 460 (minimum one hour).

Course Requirements for a minor in Mobile Development (18 hours)

A minor in Mobile Development will consist of Computer Science 244, 401, 402, 442; Design 101 and 210.

Students who are enrolled in Computer Programming II (COMP 220) may choose to change from COMP 220 to Computer Programming I (COMP 141) on or before the fifth week of class provided the student did not earn a C or higher in the COMP 141 course. The student must have the approval of the current COMP 220 instructor and the instructor of the COMP 141 course to which the student intends to move. The student must complete and return an Add/Drop Form to the Registrar's Office.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

COMPUTER SCIENCE (COMP)

COMP 141. COMPUTER PROGRAMMING I. This course provides the student with an understanding of hardware and software concepts, structured program design, and programming using Java in an integrated development environment. Topics include Boolean expressions, iteration, standard library classes and methods, arrays, searching and sorting, multidimensional arrays, strings, dynamic memory allocation, programmer-defined classes and methods, and deep copying. This course, along with Math 161 and 488, fulfills the Information Literacy (IL) requirement for the Mathematics major. *Semester course, three hours.*

COMP 155. INTRODUCTION TO COMPUTER SCIENCE. This course provides an introduction to the field of Computer Science. Topics include creating precise specifications and programming solutions for basic computing problems, data representation, and a discussion of topics from the breadth of computing such as information systems, artificial intelligence, networks, and the World Wide Web. *Fall semester only, three hours.*

COMP 205. ETHICS, FAITH, AND THE CONSCIOUS MIND. This course focuses on three components of ethics, faith, and philosophy from a computer science perspective. First, it examines the Christian theological and philosophical foundations of science and the ethical role of computer science in areas such as globalization, autonomous systems, and intellectual property. Second, it considers perspectives on the origins, nature, and future of human cognition and consciousness, including intersections of artificial intelligence and consciousness. Third, it reviews ethical systems, cyberethical professional codes, ethical problem-solving techniques, and specific ethical cases, again from a computer science perspective and building on an informed Christian response to technology. This course, along with Computer Science 350, fulfills the Information Literacy (IL) requirement for Computer Science majors. Students may only receive credit for one of Computer Science 205 or Science, Faith, & Technology 205. Prerequisites: Humanities 102 (or Religion 211 and 212) and a lab science. The lab science may be taken concurrently with this course. This course satisfies the SSFT General Education requirement. *Spring semester only, three hours.*

COMP 220. COMPUTER PROGRAMMING II. This is a second course in the Java language: a review of essential language concepts, structured programming, and top-down design. Object oriented program design principles including inheritance, abstract base classes, interfaces, virtual methods, and polymorphism are covered. Other topics include generics, linked data structures, and exception handling. Prerequisite: Computer Science 141. *Semester course, three hours.*

COMP 222. INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS. An advanced course in programming using an object-oriented language, with an emphasis on analyzing the run-time behavior of programs; the design and structure of programs; linear data structures; recursion; binary search trees; sorting; and hash techniques for searching. Prerequisite: Computer Science 220. *Fall semester only, three hours.*

COMP 233. PARALLEL COMPUTING. This course introduces students to C/C++ with an emphasis on Parallel and Distributed Computing (PD). It will include an overview of parallel architectures. Students will program both shared memory and distributed memory systems, with a focus on performance evaluations. Students will also explore concurrent (thread-based) programming with GUI elements. Prerequisite: Computer Science 220. *Spring semester only, three hours.*

COMP 244. DATABASE MANAGEMENT SYSTEMS. An introduction to database management systems emphasizing the relational model. Topics include data manipulation languages (SQL, QBE); database design (intuitive design, normalization, and E-R design model); three-tier and multi-tier architecture; database security; and database integrity. Prerequisite: Computer Science 220 or knowledge of its content. *Fall semester only, three hours.*

COMP 260. INDEPENDENT STUDY. Individual study of specialized topics in computer science. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMP 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in computer science. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

COMP 314. AUTOMATA THEORY. This course is an introduction to computation theory including the topics: finite automata, regular languages, pushdown automata, context-free languages, Turing machines, recursive languages and functions, and computational complexity. Prerequisites: Computer Science 220 and Mathematics 213. *Spring semester only, three hours.*

COMP 325. COMPUTER ARCHITECTURE AND ORGANIZATION. Organization, elementary architectural design and computer instruction sets are examined and used via programming in an assembly language. Students are given an introduction to the manner in which digital computers actually work. Prerequisite: Computer Science 233. *Fall semester only, three hours.*

COMP 340. OPERATING SYSTEMS. A study of the basic principles of operating system design and implementation including types of computer systems, general architecture of several representative computer systems, security, run-time systems, and performance measurement and evaluation. Prerequisites: Computer Science 222 and 233. Corequisite: Computer Science 325 or Electrical Engineering 204. *Semester course, three hours.*

COMP 342. DATA COMMUNICATION AND NETWORKING. This class introduces the concepts of data communications used in information networks. Topics include equipment utilization in information networks; techniques utilized to transmit signals (e.g., modulation, multiplexing, error detection, and correction); methods of message handling; network configuration; and software utilized in implementing networks. Prerequisite: Computer Science 220. *Spring semester only, three hours.*

COMP 350. SOFTWARE ENGINEERING. This course introduces software-engineering methodology, covering topics such as development cycles, testing, design, requirements gathering and analysis, and project management. Students work in teams on a semester-long project. Software Engineering is designed to fulfill the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for Computer Science majors. Prerequisite: Computer Science 220 and junior standing. *Spring semester only, three hours.*

COMP 360. INDEPENDENT STUDY. An advanced course for qualified students that provides an opportunity for further computer programming and analysis experience on an individual basis. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two, or three hours.

COMP 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in computer science. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two, or three hours.*

COMP 390. SELECTED TOPICS IN COMPUTER SCIENCE. An examination of areas of computer systems not fully covered by regular departmental offerings. Subject matter varies each offering based on topic. Prerequisites: Computer Science 220 and permission of the department.
Semester course, two or three hours.

COMP 401. PRINCIPLES OF iOS PROGRAMMING. The objective of this course is to introduce mobile computing with an emphasis on projects and programming iOS devices (e.g. iPad). Smartphones, and other Internet-based, highly mobile computing devices, are an increasingly important computing platform and driver of software design. This course covers Swift and the iOS SDK. Important software design issues, such as input modalities, UI design, and location-aware web applications are covered. Students will be provided with development systems. Prerequisite: Computer Science 222. *Alternate years, fall semester only, three hours.*

COMP 402. PRINCIPLES OF ANDROID PROGRAMMING. The objective of this course is to introduce Android with an emphasis on projects. Android mobile computing devices are an increasingly important computing platform. This course covers the Android SDK and teaches students how to develop basic Android applications. Students will be provided with development systems. Prerequisite: Computer Science 222. *Alternate years, fall semester only, three hours.*

COMP 422. INTRODUCTION TO ALGORITHMS. Topics include fundamental techniques for designing efficient algorithms and basic mathematical methods for analyzing their performance; paradigms for algorithm design; divide-and-conquer, greedy methods, graph search techniques, dynamic programming; design of efficient data structures, and analysis of the running time and space

requirements of algorithms in the worst and average cases. Prerequisite: Computer Science 222 and Mathematics 213. *Fall semester only, three hours.*

COMP 435. INTRODUCTION TO MACHINE LEARNING. Machine learning is an essential part of technologies such as image recognition, social network analysis, and autonomous vehicles. This course introduces concepts and algorithms that enable computers to learn from experience. Emphasis is on the practical application of the algorithms, with some discussion of the underlying mathematics. Techniques covered include supervised learning (linear and logistic regression, decision trees, support vector machines, and neural networks), unsupervised learning (clustering and dimensionality reduction), and time-series data (e.g., hidden Markov models or reinforcement learning). Prerequisites: Computer Science 222; and either Mathematics 214 or both Mathematics 222 and one of Mathematics 331, Psychology 201 or Mathematics 201. *Alternate years, spring semester only, three hours.*

COMP 441. 2D GAME DESIGN AND DEVELOPMENT. This course covers concepts and methods for the design and development of 2D computer games. Topics include sprites, animation, game design, game implementation, and game development environments. Prerequisite: Computer Science 222. *Fall semester only, three hours.*

COMP 442. WEB PROGRAMMING TECHNOLOGIES. This course prepares students with the fundamentals needed to program on the Internet. It offers a survey of programming concepts that yield visible or audible results in Web pages and Web-based applications. The course covers effective Web-page design, various markup languages, several scripting languages, Web servers, and databases to provide all the skills and tools needed to create dynamic Web-based applications. Prerequisite: Computer Science 220 and 244. *Fall semester only, three hours.*

COMP 443. PROGRAMMING LANGUAGES. This course investigates basic concepts of programming languages, including functions, types, and scoping. Functional programming is an emphasis of the course, including first-order functions, lambda expressions, and referential transparency. Prerequisite: Computer Science 222. *Spring semester only, three hours.*

COMP 445. INTRODUCTION TO ARTIFICIAL INTELLIGENCE. Artificial intelligence topics included in this class are: predicate calculus, state space search, knowledge representation, expert systems, reasoning in uncertain situations, and machine learning. Prerequisites: Computer Science 222; and one of Mathematics 214, Mathematics 331, or Engineering 274.
Spring semester only, three hours.

COMP 446. 3D GAME DESIGN AND DEVELOPMENT. This course is a continuation of Computer Science 441 and is focused on the development of 3D games and other advanced game programming techniques. Topics include graphics, lighting, textures, performance, the 3D pipeline, and intentional design. Prerequisite: Computer Science 441.
Alternate years, spring semester only, three hours.

COMP 447. NETWORKED GAME DESIGN AND DEVELOPMENT. This course is a continuation of Computer Science 441 and is focused on the development of networked, multiplayer console games. Topics include client/server models, synchronization, building code for single and multiplayer use, and techniques for lag mitigation. Prerequisites: Computer Science 441.
Alternate years, spring semester only, three hours.

COMP 448. COMPUTER SECURITY. An overview of software security flaws a programmer should be careful to avoid. Students will learn how to avoid these flaws, as well as practice finding them in existing code. Additionally, better alternatives will be explored which will allow students to make better programs that are less vulnerable to security exploits. Prerequisite: Computer Science 233; Corequisite: Computer Science 325. *Fall semester only, three hours.*

COMP 451. SENIOR PROJECT I. This course is part of the capstone design experience and is based on applying software engineering to a two-semester long project. This course focuses on design.

Students will write reports and make presentations. This course partially fulfills the Information Literacy (IL) requirements for Computer Science majors. Prerequisite: Computer Science 350.
Fall semester only, two hours.

COMP 452. SENIOR PROJECT II. This course is a continuation of Computer Science 451 and is focused on the development of a working, tested system delivered to a user community. Students will write reports, make presentations, and deliver a working software system. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for Computer Science majors. Prerequisite: Computer Science 451. *Spring semester only, three hours.*

COMP 460. INDEPENDENT STUDY. An advanced course for qualified students that provides an opportunity for further computer programming and analysis experience on an individual basis. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two, or three hours.

COMP 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in computer science. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two, or three hours.*

COMP 475. ADVANCED SECURITY. A more comprehensive study of computer security, including the goals of secure computing; elementary cryptography; and system and network security. Practical applications of these ideas are provided by an investigation of secure systems administration by means of team-based security projects. Various legal and ethical issues in the field are also considered. Prerequisites: Computer Science 205, 342, and 448. *Spring semester only, three hours.*

COMP 480. INTERNSHIP IN COMPUTER SCIENCE. Students earn academic credit for field experience that allows them to use their computer skills under the supervision of a cooperating entity. A maximum of six credit hours may be applied toward the major. Junior standing and permission of the department chair are required. *Semester course, one to six hours.*

COMP 499. HONORS IN COMPUTER SCIENCE. A course for qualified junior or senior students who are interested in an advanced computer-science experience. The course has a significant research component, including system development, review of literature, and writing. Topics change with each offering depending on the interests of the faculty member teaching the course. Prerequisite: Permission of the instructor and department chair. *Semester course, one, two, or three hours.*

DATA SCIENCE (DSCI)

DSCI 144. INTRODUCTION TO DATA SCIENCE. An introduction to methods and tools used to analyze and understand data. Topics include computer programming in Python and common toolkits for data analysis and visualization. Students engage in hands-on analysis of real-world data sets and discuss social issues related to data analysis.
Fall semester only (expected to start: Fall 2021), three hours.

DSCI 215. STATISTICAL COMPUTING. This course will focus on the tools required to process large data sets using current statistical software and software packages. Code segments for simple statistical tests as well as more complex statistical analyses will be developed. Software selection may change based on current statistical practice. Prerequisite: Computer Science 141, and one of Management 201, Mathematics 201, or Psychology 201.
Spring semester only (expected to start: Spring 2022), three hours.

DSCI 431. INTRODUCTION TO BIG DATA. The objective of this course is to introduce key concepts and technologies of big data management. This course covers big data characteristics, storage, and processing. Students learn how to use multiple big data technologies, such as stream processing, in-memory databases, Hadoop MapReduce, NoSQL, and NewSQL systems. Prerequisites: Computer Science 220 and 244. *Alternate years, spring semester only, three hours.*

DSCI 450. APPLIED MODELING AND VISUALIZATION. The capstone course in data science. Students apply modeling and visualization techniques to a large project, giving presentations about their results and writing a report. Legal and ethical issues in data science are examined. Prerequisites: MATH 213 or MATH 331; MATH 214 or MATH 222; DSCI 144; DSCI 215; COMP 222; COMP 244; DSCI 431 or COMP 435. *Spring semester only (expected start: Spring 2022), three hours.*

DEPARTMENT OF ECONOMICS AND SOCIOLOGY

Dr. Herbener, Chair; Dr. Ayers, Dr. Frank, Dr. Fuller, Dr. Ritenour.

Course Requirements for a Bachelor of Arts Degree in Economics—58 hours

Core Requirements (27 hours):

Economics 101, 102, 120, 301, 302, 342, 407, 408, and 420.

Economics Electives (15 hours):

Fifteen hours from the following:

Economics 202, 204, 206, 207, 213, 214, 215, 216, 260, 270, 290, 303, 306, 309, 310, 360, 370, 390, 401, 402, 404, 456, 460, 470, 480 (3 cr max), and 499.

Major-Related Requirement (16 hours):

Philosophy 161, 211; Management 201; Mathematics 141 or 161*; and Sociology 101.

Courses that count in the Economics major quality point average (MQPA):

All courses with "ECON" prefix. A minimum of 2.00 MQPA is required to graduate.

Course Requirements for a Bachelor of Science Degree in Business Economics—70 hours

Business Core Requirements (36 hours)

Accounting 201, 202; Finance 301; International Business 205; Management 103, 111, 201, 214, 303, 304, 486; and Marketing 104

Economics Core (30 hours):

Economics 101, 102, 120, 216, 301, 302, 310, 401, 402, and 456.

Major-Related Course (4 hours):

Mathematics 141 or 161*.

**Mathematics 141 prepares students in the business applications of calculus, but Mathematics 161 must be taken as a prerequisite for Mathematics 162 and 261.*

Courses that count in the Business Economics major quality point average (MQPA):

All courses with "ACCT", "ECON", "FNCE", "INBS", "MARK", "MNGT" prefix, excluding FNCE 105 and MNGT 106. A minimum MQPA of 2.00 is required to graduate.

Students who have completed a major in Economics or Business Economics should be able to perform and present economic analysis and understand and critique the economic analysis of others. To attain these ends, they need to develop skills in locating, evaluating, and using information and proficiency in writing and speaking. To give students a forum to demonstrate their mastery of these skills, the Department of Economics requires Economics 420 as a Writing Intensive (WI), Speaking Intensive (SI) and Information Literacy (IL) course for Economics majors, and Management 214 as WI and IL and Management 486 as SI for Business Economics majors.

Course requirements for Bachelor of Arts Degree in Sociology—38 hours

Core Requirements (14 hours):

Sociology 101, 201, 377, 452, and 473.

Elective Requirements (15 hours):

Fifteen hours from any additional sociology courses including the following: Sociology 103, 203, 208, 221, 233, 241, 251, 260, 270, 290, 308, 312, 314, 315, 321, 331, 356, 360, 370, 375, 390, 460, 470, 480, and 499.

Major-Related Courses (9 Hours):

Economics 101; Psychology 201, 208.

Courses that count in the Sociology major quality point average (MQPA):

All courses with "SOCI" prefix; ECON 101; PSYC 201 and 208. A minimum MQPA of 2.00 is required to graduate.

Sociology majors are provided with focused, discipline-specific instruction in professional writing by taking the Writing Intensive (WI) course Sociology 377 *Social Research Methods*, and in professional speaking by taking the Speaking Intensive (SI) course Sociology 452 *Sociology Colloquium.* Information Literacy (IL) instruction is also incorporated in Sociology 377, focusing on knowledge and use of electronic information technology and resources, critically assessing this information, and teaching skills that explore scholarly research and publishing processes within the field of Sociology.

Course requirements for a minor in Criminal Justice Studies (19 hours)

A minor in Criminal Justice Studies will consist of Sociology 101, 377, and four courses from Sociology 203, 221, 233, 314, 315, 331, or Economics 402.

Course Requirements for a minor in Economics (21 hours)

A minor in Economics will consist of Economics 101, 102, 120, and twelve additional hours in economics.

Course requirements for a minor in Family Studies (19 hours)

A minor in Family Studies will consist of Psychology 201; Sociology 312; one course from Psychology 204, Political Science 277, or Sociology 377; and three courses from Psychology 209, 211, 322, or Sociology 251.

Course requirements for a minor in Sociology (19 hours)

A minor in Sociology will consist of Sociology 101, 377, 473, and nine additional hours of Sociology coursework.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ECONOMICS (ECON)

ECON 101. PRINCIPLES OF ECONOMICS (MICRO) I. An examination of the fundamental principles of human action and the laws of the market economy. Focus will be on exchange, prices, production, costs, entrepreneurship, and government intervention. *Three hours*.

ECON 102. PRINCIPLES OF ECONOMICS (MACRO) II. An examination of the fundamental principles of human action and the laws of the market economy. Focus will be on money, inflation, credit, interest, capital, economic progress, and business cycles. *Three hours*.

ECON 120. FOUNDATIONS OF ECONOMICS. An investigation of the theological, philosophical and epistemological foundations of economics. The nature of man and the created world, laws of action and interaction, and the good society will be explored. *Three hours*.

ECON 202. ECONOMIC EXPANSION AND DEVELOPMENT. A study of economic progress with emphasis on the developing world. Topics include wealth, poverty, capital accumulation, and foreign aid. *Three hours*.

ECON 204. ENVIRONMENTAL ECONOMICS. An investigation of environmental, conservation, and population issues. Pollution, natural resource use, demographic changes, and technology will be studied. *Three hours*.

ECON 206. COMPARATIVE ECONOMIC SYSTEMS. An analysis of different economic systems. The command economy, various forms of the mixed economy, different types of interventionism, and the market economy will be compared and contrasted. *Three hours*.

ECON 207. LABOR ECONOMICS. An analysis of the working of labor markets. Labor unions and labor legislation and regulation will be examined. *Three hours*.

ECON 213. AMERICAN ECONOMIC HISTORY TO 1860. A survey of the American economy from colonial days to the Civil War. Economic progress and business cycles will be examined with emphasis on how the market economy was developed by entrepreneurs and hampered by politicians. *Three hours*.

ECON 214. AMERICAN ECONOMIC HISTORY SINCE 1860. A survey of the American economy from the Civil War to the present. Economic growth and business cycles will be examined with emphasis on how the market economy was developed by entrepreneurs and hampered by politicians. *Three hours*.

ECON 215. URBAN AND RURAL ECONOMICS. An examination of the spatial aspects of economic activity. Location decisions of production facilities by entrepreneurs and households by families will be examined with an emphasis on the changes in cities and rural areas as an aspect of economic development. *Three hours*.

ECON 216. ECONOMICS OF ENTREPRENEURSHIP. An examination of entrepreneurship both theoretically and in applied issues including innovation, growth, financing, strategy, institutional environment, and policy. *Three hours*.

ECON 260. INDEPENDENT STUDY. Individual study of specialized topics in economics. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Three hours*.

ECON 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in economics. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Three hours*.

ECON 290. STUDIES IN ECONOMICS. Studies in areas of economics not covered by regular departmental offerings. *Three hours*.

ECON 301. INTERMEDIATE MICROECONOMICS. A study of prices and production. Utility, costs, competition, and equilibrium will be examined. Prerequisites: Economics 101 and 102. *Three hours*.

ECON 302. INTERMEDIATE MACROECONOMICS. A study of economic progress and business cycles. Keynesian, Monetarist, Austrian, and other views will be examined. Prerequisites: Economics 101 and 102. *Three hours*.

ECON 303. INTERNATIONAL ECONOMICS. An examination of the worldwide market economy. The movement of goods, people, capital, and money across political borders and political interference with the market will be investigated. Prerequisites: Economics 101 and 102. *Three hours*.

ECON 306. AUSTRIAN ECONOMICS. An examination of the lives and thoughts of Austrian school economists. Contributions in monetary, capital, and business cycle theory, methodology, economic calculation, entrepreneurship, and other areas will be highlighted. *Three hours*.

ECON 309. PUBLIC POLICY. An analysis of current public policy. Topics include labor and anti-trust regulations, education and energy policies, welfare programs, and price and wage controls. *Three hours*.

ECON 310. INDUSTRIAL ORGANIZATION. A study of how producers seek to satisfy demand in different market environments they face. The structure and activities of industries and the effects of these on competition, prices, and resource allocation in the economy will be examined. Prerequisite: Economics 101. *Three hours*.

ECON 342. INTRODUCTION TO ECONOMETRICS. This course explores probability theory, hypothesis testing, simple and multiple regression analysis, specification of econometric models, and introduces quasi-experimental techniques. Emphasis is placed on application of econometric techniques in estimating economic relationships. Prerequisites: Management 201 and Mathematics 141. *Three hours*.

ECON 360. INDEPENDENT STUDY. Individual study of special topics in economics. Junior standing, permission of the department chair, and a faculty sponsor are required. *Three hours*.

ECON 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in economics. Junior standing, permission of the department chair, and a faculty sponsor are required. *Three hours*.

ECON 390. STUDIES IN ECONOMICS. Studies in areas of economics not covered by regular departmental offerings. *Three hours*.

ECON 401. MONEY AND BANKING. A study of money and credit. Inflation, interest rates, and various monetary and banking regimes will be investigated. Prerequisites: Economics 101 and 102. *Three hours*.

ECON 402. LAW AND ECONOMICS. An economic analysis of law's traditional categories: property, tort, contract, and criminal. This course will follow the outline of traditional courses in law and economics but will also devote time to the critiques that have been leveled against law and economics. Prerequisite: Economics 101 or 120. *Three hours*.

ECON 404. PUBLIC FINANCE. An examination of the types of and justifications for government activity. Taxation, expenditures, debt, and monetary inflation will be explored. Prerequisites: Economics 101 and 102. *Three hours*.

ECON 407. HISTORY OF ECONOMIC THOUGHT TO 1870. A study of the prominent figures in the development of economic thought and the major schools of economic thought from the ancient Greeks through the British classical school. Insights into current debates about economic theory will be highlighted. *Three hours*.

ECON 408. HISTORY OF ECONOMIC THOUGHT SINCE 1870. A study of the prominent figures in the development of economic thought and the major schools of economic thought from the beginning of the marginalist revolution to the present. Insights into current debates about economic theory will be highlighted. *Three hours*.

ECON 420. ECONOMICS COLLOQUIUM. An immersion into the activities of scholars: writing, presenting, critiquing, and debating. Students will lead and participate in discussions of articles and books, write and present their own research, and critique the research of other students. This course satisfies the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for the Economics major. Prerequisites: Senior standing or permission of the department chair. *Three hours*.

ECON 456. FINANCIAL MARKETS AND INSTITUTIONS. A study of the nature, origin, working and development of financial markets and institutions. Topics include the markets for and institutions offering credit, equities, and derivatives. Prerequisite: Economics 101 and 102. *Three hours*.

ECON 460. INDEPENDENT STUDY. Individual study of special topics in economics. Senior standing, permission of the department chair, and a faculty sponsor are required. *Three hours*.

ECON 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in economics. Senior standing, permission of the department chair, and a faculty sponsor are required. *Three hours*.

ECON 480. INTERNSHIP IN ECONOMICS. Practical experience in applied economics. Prerequisite: Permission of the department chair. *Three hours*.

ECON 488. SEMINAR IN ECONOMICS. An advanced course for juniors and seniors who desire in-depth exploration of a specific topic in economics using research, discussion, oral reports and written essays. Prerequisite: Permission of the department chair. *Three hours*.

ECON 499. HONORS IN ECONOMICS. Advanced research in economics by seniors who have shown unusual aptitude in economics. Prerequisite: Permission of the department chair. *Three hours*.

SOCIOLOGY (SOCI)

SOCI 101. FOUNDATIONS OF SOCIOLOGY. An introductory study of the major and enduring theoretical ideas, concepts, methods, and debates that have shaped and informed the discipline of sociology from its inception to the current day. Topics include the origins of the discipline, the social conditions under which humans may thrive, social order, religion, and inequality. Attention is also paid to the ways in which the Christian tradition perceives and, in some cases, may challenge contemporary social conditions. Recommended to precede all other sociology courses. *Three hours*.

SOCI 103. FOUNDATIONS OF CULTURAL ANTHROPOLOGY. An introduction to the study of culture, its meaning and significance for human beings, and the ways in which man organizes his activities to meet universal human needs, especially in simpler societies. *Three hours*.

SOCI 105. PERSPECTIVES ON SOCIOLOGY. A one-credit course for students wishing to meet the College's "Foundations of Social Sciences" general education requirement by transferring in a standard introduction to sociology course taken elsewhere, that provides the unique content within Grove City College's Sociology 101 Foundations of Sociology course. The following themes are covered: epistemological foundations of sociology, sociological views of human beings and their actions, foundations of social order, engines of social progress, and sociological understandings of the divine. Prerequisite: A Sociology 101 comparable class transferred from another institution. *Three hours*.

SOCI 201. SOCIAL PROBLEMS. An analysis of American social problems such as family, sexuality, drugs, crime, health, poverty, race, and global problems such as population, the environment, religion, war and terrorism. *Three hours*.

SOCI 203. SOCIOLOGY OF DEVIANT BEHAVIOR. A study of the social aspects of personal deviation including consideration of the alcoholic, the drug addict, the suicidal and the sexually

maladjusted from the perspective of social background, causative factors, and possible therapy. Prerequisite: Sociology 101 or 201. *Three hours*.

SOCI 208. GERONTOLOGY. A general introduction to gerontology, with emphasis on the normative aspects of aging and adaptation to old age. Topics include the role of senior citizens in the family and a youth-oriented culture, theories of disengagement, role activity in retirement and aging from a cross-cultural perspective. *Three hours*.

SOCI 221. WHITE COLLAR CRIME. An in-depth examination of important concepts, theories, and facts related to white collar crime, using case studies, academic lectures, guest lecturers and films. The degree to which such crimes occur, as well as their economic and social costs, will be considered. Victims and offenders will be described. Legal issues and problems in dealing with white collar crime will also be considered, with a special consideration of the typical legal, political, and cultural barriers encountered in trying to create and enforce relevant laws, including detection and punishments. *Three hours*.

SOCI 233. INTRODUCTION TO CRIMINAL JUSTICE. An overview of every element of the criminal justice system, looking at the process of handling offenders from crime detection through arrest, adjudication, prosecution/defense, sentencing, incarceration, probation, and parole. Issues of criminal law (ethics, philosophy, and basic structure and rules) and policy, defendants, victims, and the roles of different criminal justice agents will also be considered. Biblical perspectives will be examined throughout, as will, where appropriate, private alternatives to response to crime. *Three hours*.

SOCI 241. MEDICAL ANTHROPOLOGY. A study of the social and cultural aspects of medicine and health, strongly emphasizing the results of cross-cultural and comparative research. Topics include health professionals and services around the world, alternative healers, the demography of health and illness, and privatized versus government-sponsored health care systems. *Three hours*.

SOCI 251. COURTSHIP AND MARRIAGE. A general introduction to marriage and the family that emphasizes practical living. Topics include dating, courtship, engagement, marriage, romantic love, and marital adjustment across the lifespan. Also included are discussions of singleness, parenting, and divorce. *Three hours*.

SOCI 260. INDEPENDENT STUDY. Individual study of specialized topics in sociology. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

SOCI 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in sociology. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours*

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SOCI 290. STUDIES IN SOCIOLOGY. This course, which varies each semester, involves the examination of different areas of sociology with a focus on new areas not covered in regular coursework. *Three hours*.

SOCI 308. SOCIOLOGY OF RELIGION. This course will examine religion from a sociological perspective, including such topics as sociological theories about religion, how religion affects individuals and societies, secularization and worldwide religious resurgence, effects of globalization upon religion, America's contemporary religious climate, contemporary American Evangelicalism, and the future of religion. *Three hours*.

SOCI 312. THE FAMILY AS A SOCIAL INSTITUTION. A course that focuses upon the status, development, and future of the modern American family from historical, cross-cultural, and sociological perspectives. Examines contemporary debates over legal definitions of "family", patterns of family structure, families and the elderly, family policy, and reviews non-governmental approaches

to strengthening the family. Recommended for those students contemplating careers in teaching, the helping professions, ministry, public policy, and research. *Three hours*.

SOCI 314. CRIMINOLOGY. An introduction to the scientific study of crime. This includes classical and modern criminological theories and methods, various types of criminal behavior and what triggers them, social and environmental factors that affect levels of crime, comparisons of crime rates across place and time. Prerequisite: Sociology 101 or 201. *Alternate years, fall semester only, three hours.*

SOCI 315. JUVENILE DELINQUENCY. An examination of the meaning of juvenile delinquency and the social institutions and psychological phenomena that shape juveniles. Significant trends in delinquency will be highlighted. *Three hours*.

SOCI 321. SOCIAL CHANGE. An analysis of patterns, mechanisms and strategies of past and future social change in a rapidly changing world. Social and political movement theory, revolutions, the force of religion in social movement activism, and recent changes in American society are considered. Prerequisite: Sociology 101. *Three hours*.

SOCI 331. LAW AND SOCIETY. An exploration of the relationship among law, legal systems, and social structure. Topics include the origin and development of law, sociological theories of law, the relationship of Christianity and the law in the West, analysis and cross-cultural comparisons of dispute resolutions and other judicial processes (includes legal anthropology), comparisons of modern legal systems, the social psychology of legal decision-making including jury studies, and the legal profession. *Three hours*.

SOCI 356. POVERTY AND STRATIFICATION. An overview of the nature and extent of poverty and stratification in the United States and the world, including consideration of empirical data, sociological theory, and Christian perspectives. Special attention will be given to private, faith-based solutions to chronic poverty. Prerequisite: Sociology 101 or 201. *Three hours*.

SOCI 360. INDEPENDENT STUDY. Available to students with a minimum of twelve hours in sociology. Junior standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

SOCI 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in sociology. Junior standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

SOCI 375. GLOBAL SOCIETY. An investigation of how the dynamics of social order are impacted by the development of a global social order, including Christian perspectives on global order. *Three hours*.

SOCI 377. SOCIAL RESEARCH METHODS. This course will study the basic methods for social research. This includes selecting topics, developing and operationalizing concepts, sampling, establishing causal relations, data collection using secondary (especially aggregate and comparative) sources, content analysis and other unobtrusive approaches, surveys, field research, interviews, experiments. The weekly lab will focus on creating databases for a computer statistical package; coding, entering and analyzing data, and writing professional research reports. This class will fulfill the Information Literacy (IL) and Writing Intensive (WI) requirements for the Sociology major. Prerequisites: Sociology 101 and Psychology 201. *Alternate years (odd), fall semester only, four hours.*

SOCI 390. STUDIES IN SOCIOLOGY. This course, which varies each semester, involves the examination of different areas of sociology with a focus on new areas not covered in regular coursework. *Three hours*.

SOCI 452. SOCIOLOGY COLLOQUIUM. Guided intensive study of a specific sociological problem or topic under the guidance of one Sociology faculty member, and training in the art of

professional speaking in the field. Students will orally present and defend their study proposals and completed final projects before the Sociology faculty and other students in the class. This course fulfills the discipline-specific Speaking Intensive (SI) requirement for Sociology majors. Prerequisite: junior status. *One hour.*

SOCI 473. SOCIOLOGICAL THEORY. Overview of major schools of Sociological Theory with a focus on major thinkers and the central questions that have historically animated the discipline. These include: Functionalism, Conflict and Critical Theories including Marxism and World Systems Theory, Exchange and Rational Choice, Post-Modern, Symbolic Interactionism, Phenomenology and Ethnomethodology. Prerequisites: Sociology 101 and junior standing in the Sociology major, or Instructor's permission. *Alternate years (even), spring semester only, three hours*

SOCI 460. INDEPENDENT STUDY. Available to students with a minimum of twelve hours in sociology. Senior standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

SOCI 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in sociology. Senior standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

SOCI 480. INTERNSHIP IN SOCIOLOGY. This course offers practical experience appropriate for the sociology field. Prerequisite: Permission of the department chair.
Semester course, one to six hours.

SOCI 499. HONORS IN SOCIOLOGY. Open only to seniors who have honors grades and who have completed a minimum of fifteen hours in the department. Application must be made to the department and a proposal for the study must be approved before registering. The student studies under the guidance of department staff. Prerequisite: Fifteen hours in sociology including Sociology 377. *One, two or three hours.*

DEPARTMENT OF EDUCATION

Dr. Nichols, Chair; Dr. Chapman, Associate Chair; Dr. Blackburn, Dr. Culbertson, Dr. Dreves, Dr. Fecich, Dr. Natalie Heisey, Mrs. Munson, Dr. Sabousky. Adjunct: Mrs. Martin. Additional Instructional Faculty: Mrs. Bodamer, Mrs. Herald, Mr. Omasits, Mrs. Sarah Potter, Mrs. Liz Rupnik.

The Education Department of Grove City College embraces the mission, goals, and objectives of the College while implementing standards established for teacher education by the state of Pennsylvania and as recommended by research in the field of education. The faculty of the Education Department supports these objectives and standards and seeks to provide the specialized knowledge required by the education profession. Department faculty and staff members dedicate themselves to assist Grove City College pre-service teachers gain an understanding of the craft while supplying them with ample field experiences to practice the art of teaching.

Pedagogical, intellectual, and professional knowledge represent the tools of the teaching craft. These tools are selected so that our pre-service teachers possess the skills they need to plan, assess, and adapt instruction to various ethnicities, socio-economic groups, learning styles, and learning capabilities. We are united in our commitment to supply our pre-service teachers with the necessary capabilities to be successful in teaching to the whole person when they leave our mentoring and enter their own classrooms.

Education majors who are planning to become teachers or to pursue graduate studies following graduation should strive to be good writers and speakers and to know how to find, analyze, and use information. To that end, Education 488 is a Writing Intensive (WI) and Speaking Intensive (SI) course. Education 203 and 488 are Information Literacy (IL)

courses designed to provide the necessary skills for Education majors to use electronic information technology and resources and explore scholarly research within the field of education.

CERTIFICATION OF TEACHERS

Grove City College is approved by the Pennsylvania Department of Education to offer certification programs in the areas of Elementary, Elementary with Middle Level, Middle Level, Elementary with Special Education, Foreign Language K-12, and Secondary School Education in any of the following subject areas: Biology, Chemistry, English (also with communications), Foreign Language (French and Spanish), Mathematics, Music, Physics, Social Sciences, and interdisciplinary fields of General Science - Biology, Chemistry, and Physics. Middle-level certification includes a broad range of teaching preparation along with two content area studies: Science and Math, Science and English, Science and History, Math and English, Math and History. Secondary certification students work closely between the Education Department and their content areas to complete courses recommended to meet requirements for the subject area education major and also the professional education course requirements.

Teachers are prepared for careers in public and private education across a wide variety of roles in public, private, international, and additional fields within education. The Department of Education offers in depth career counselling throughout the education development of students, and after graduation. Additionally, the Department offers the services of a Certification Officer to assist students in meeting requirements for teacher licensure. Pennsylvania Teacher licensure includes the Instructional I Certificate is issued by the Pennsylvania Department of Education to those Grove City College graduates who have completed an approved college program, successfully fulfilled Pennsylvania Teacher Certification requirements (including required testing, Act 33, Act 34, Act 114 clearances and other state requirements), and have been recommended by the College for certification. Additional areas of study (as approved by the PA Department of Education), such as the Integrative Science Technology Engineering Mathematics Endorsement may also be completed upon completion of approved program and fulfillment of state requirements.

It should be noted that graduation and certification are not synonymous terms. All students seeking certification must apply to the Department of Education for admission to the certification program. Admission, retention, and recommendation for certification are contingent upon the approval of the Department of Education and the faculty of the student's area of certification. Education Majors must meet the entry testing requirements articulated by the Pennsylvania Department of Education prior to formal admission into the certification program.

Changes in state licensure requirements may necessitate changes in course requirements for students, particularly for those students who extend their studies beyond the typical four-year sequence. Careful attention to Education Department recommendations for course scheduling is important for staying current with certification requirements.

SCHOLASTIC REQUIREMENTS, ADMISSION AND RETENTION

All students wishing to enter the teacher education program must make formal application for admittance and receive acceptance in accordance with admission requirements. **Students seeking admission as credential candidates should make formal application by November 1 of the sophomore year.** Non-traditional (returning) students are advised on an individual basis (*see Student Life section*).

All students will be required to have a 3.00 Career Quality Point Average (CQPA) to be certified by the Commonwealth of Pennsylvania. This requirement reflects provisions as stated by Chapter 354, passed by the Pennsylvania State Board of Education in May 2000.

In order that students may meet the above standard, the Education Department monitors progress. Students must maintain a minimal CQPA and MQPA as they advance through each academic year. These QPA requirements are detailed in the *Education Department Handbook.* Students are, therefore, advised to reference this source for further information.

Students seeking Endorsement programs may have additional requirements to meet, including making progress on initial certification requirements and admittance to the endorsement program.

POLICY GOVERNING COURSE REQUIREMENTS FOR CERTIFICATION ONLY TEACHER CANDIDATES

For those teacher candidates who are already certified in some area and seek certification at Grove City College in an additional area, the following guidelines are to be followed contingent upon Grove City College and Pennsylvania Department of Education guidelines:

- Candidates who have already taken courses in the area in which they seek certification must take at least 50% of the courses required for this certification at Grove City College.
- Candidates who start with no hours in the additional area of certification may only transfer six hours to Grove City College without special advance permission from the department head in their new area of certification.
- Candidates seeking certification must have a minimum career QPA of 3.00 and a minimum major QPA of 2.75 to enter the Grove City College program.

For candidates who have no certification but have a degree from a regionally accredited college or university, these guidelines are to be followed, contingent upon Grove City College and Pennsylvania Department of Education guidelines:

- Candidates who have had the required hours in their major (as shown on their status sheet) but require education courses for certification must take all of their education courses at Grove City College. (Under certain conditions up to six hours may be taken elsewhere with prior approval.) Candidates who have the required hours in their major may, however, be required to take up to fifteen additional hours in their subject area at the discretion of their subject area advisor.
- Candidates who have had their hours in education (as shown on their status sheet) but have not had the required subject area courses must take all of their subject area courses at Grove City College. (Under certain conditions up to six hours may be taken elsewhere with prior approval.)
- Candidates who have not had the required education and subject area courses will follow both of the above guidelines.
- Candidates must have completed the teacher education core curriculum courses.
- Candidates who have already earned an undergraduate degree must have a minimum career QPA of 3.00 and a minimum major QPA of 2.75 to enter the Grove City College program.
- Additional requirements for certification may include passing scores on the Praxis exam.

REQUIREMENTS FOR TEACHING IN OTHER STATES

Students seeking certification in states other than Pennsylvania should consult the credential officer in the Department of Education and research licensure requirements through specific state departments, offices, and/or bureaus of education.

INTERNATIONAL STUDENTS

International Students, who are not US citizens and who are interested in certification to teach, are advised to consult with the credential officer in the Department of Education for further information. The Pennsylvania Department of Education currently requires that candidates for certification be US Citizens or those who have signed a "declaration of intent" to become a US Citizen.

TEACHER'S EXAMINATIONS

Credential candidates must successfully complete the appropriate sections of the National Teachers Examination for certification in Pennsylvania or other states. Test information is available via the Department of Education Career Services website.

ELEMENTARY, SPECIAL EDUCATION, and MIDDLE LEVEL PROGRAMS

Students completing programs of study that lead to certification for teaching may be required to complete more than the standard 128 hours required to graduate from Grove City College and may also incur additional tuition charges. Program requirements and other specific details are available in the Education Department Office.

Course Requirements for Bachelor of Science Degree in Elementary Education—73 hours

Liberal Arts Core (15 hours):

Art 321; Exercise Science 228; Mathematics 151, 152; Music Education 315; Psychology 102 and 209.

Education Core Requirements (58 hours):

Education 202*, 203, 204, 281, 323, 324, 325, 326, 327, 328, 342, 343, 381, 382, 383, 441, 443, 488; and Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Elementary Education major quality point average (MQPA):

All courses with "EDUC" prefix, PSYC 102, 209, and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Special Education with Elementary Education—92 hours

Liberal Arts Core (15 hours):

Art 321; Exercise Science 228; Mathematics 151, 152; Music Education 315; Psychology 102 and 209.

Education Core Requirements (53 hours):

Education 202*, 203, 204, 281, 323, 324, 325, 326, 327, 328, 342, 343, 441, 488; Special Education 411 and 412. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Dual Certification in Special Education Requirements (24 hours):

Special Education 101, 103, 202, 203, 204, 205, 306, 307, 308, and 309.

Courses that count in the Special Education with Elementary Education major quality point average (MQPA):

All courses with "EDUC" and "SEDU" prefixes; PSYC 102 and 209. A minimum MQPA of 2.00 is required to graduate. The minimum QPAs to be certified are 3.00 for the cumulative CQPA and 2.75 for the MQPA.

Course Requirements for Bachelor of Science Degree in Special Education with a concentration in Elementary Education—90 hours

Liberal Arts Core (12 hours):

Mathematics 151, 152; Psychology 102, and 209.

Special Education Core Requirements (69 hours):

Education 202*, 203, 204, 281, 323, 325, 326, 327, 342, 343, 488; Special Education 103, 202, 203, 204, 205, 306, 307, 308, 309, 411, 412, and 413. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Concentration in Elementary Education (9 hours):

Special Education 101; Education 324, 328, and one of Art 321, Exercise Science 228, or Music Education 315.

Courses that count in the Special Education with a concentration in Elementary Education major quality point average (MQPA):

All courses with "EDUC" and "SEDU" prefixes; PSYC 102 and 209. A minimum MQPA of 2.00 is required to graduate. The minimum QPAs to be certified are 3.00 for the cumulative CQPA and 2.75 for the MQPA.

Course Requirements for Bachelor of Science Degree in Special Education with a concentration in Middle Level Education—91 hours

Liberal Arts Core (12 hours):

Mathematics 151, 152; Psychology 102, and 209.

Special Education Core Requirements (69 hours):

Education 202*, 203, 204, 281, 323, 325, 326, 327, 342, 343, 488; Special Education 103, 202, 203, 204, 205, 306, 307, 308, 309, 411, 412, and 413. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Concentration in Middle Level Education (10 hours):

Special Education 101; Education 324, 329, and 381.

Courses that count in the Special Education with a concentration in Middle Level Education major quality point average (MQPA):

All courses with "EDUC" and "SEDU" prefixes; PSYC 102 and 209. A minimum MQPA of 2.00 is required to graduate. The minimum QPAs to be certified are 3.00 for the cumulative CQPA and 2.75 for the MQPA.

Course Requirements for Bachelor of Science Degree in Special Education with a concentration in Secondary Education—86 hours

Liberal Arts Core (6 hours):

Psychology 102, and 209.

Special Education Core Requirements (69 hours):

Education 202*, 203, 204, 281, 323, 325, 326, 327, 342, 343, 488; Special Education 103, 202, 203, 204, 205, 306, 307, 308, 309, 411, 412, and 413. *Note: Students who

completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Concentration in Secondary Education (11 hours):

Special Education 102; Education 215, 371, and two secondary content courses (minimum six hours) from the same department choosing from Biology, Chemistry, English, History/Social Studies, Mathematics, and Physics. Note: any MATH courses taken for the Quantitative/Logical Reasoning requirement may not be used for this requirement.

Courses that count in the Special Education with a concentration in Secondary Education major quality point average (MQPA):

All courses with "EDUC" and "SEDU" prefixes; PSYC 102 and 209. A minimum MQPA of 2.00 is required to graduate. The minimum QPAs to be certified are 3.00 for the cumulative CQPA and 2.75 for the MQPA.

Course Requirements for Bachelor of Science Degree in Middle Level Math/English Education—99 hours

Liberal Arts Core (27 hours):

History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; Psychology 102; Science 201 or Physics lab course; Science 202 or Biology lab course; and Science 203 or Chemistry lab course.

Math/English Content (18 hours):

Three MATH prefix courses (9 hours); and three COMM/ENGL prefix courses (9 hours) choosing from the following: English 203, 204, 222, 261, 302, 351, 352, 402, Communication Arts 104, 225, 235, or 378.

Education Core Requirements (54 hours):

Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 383, 442, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Middle Level Math/English Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Math/History Education—90 hours

Liberal Arts Core (27 hours):

History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; Psychology 102; Science 201 or Physics lab course; Science 202 or Biology lab course; and Science 203 or Chemistry lab course.

Math Content (9 hours):

Three MATH prefix courses.

Education Core Requirements (54 hours):

Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 383, 442, 444, 488; and Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Middle Level Math/History Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Science/English Education—94 hours

Liberal Arts Core (15 hours):

History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; and Psychology 102.

Science/English Content (25 hours):

Science 201 or Physics lab course; Science 202 or Biology lab course; Science 203 or Chemistry lab course; one additional four-credit science course; and three COMM/ENGL prefix courses (9 hours) choosing from the following: English 203, 204, 222, 261, 302, 351, 352, 402, Communication Arts 104, 225, 235, or 378.

Education Core Requirements (54 hours):

Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 383, 442, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Middle Level Science/English Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Science/History Education—85 hours

Liberal Arts Core (9 hours):

Math 151, 152; and Psychology 102.

Science/History Content (22 hours):

History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Science 201 or Physics lab course; Science 202 or Biology lab course; Science 203 or Chemistry lab course; one additional four-credit science course.

Education Core Requirements (54 hours):

Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 383, 442, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Middle Level Science/History Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Science/Math Education—94 hours

Liberal Arts Core (15 hours):
History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; and Psychology 102.

Science/Math Content (25 hours):
Three MATH prefix courses (9 hours); Science 201 or Physics lab course; Science 202 or Biology lab course; Science 203 or Chemistry lab course; and one additional four-credit science course.

Education Core Requirements (54 hours):
Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 383, 442, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Middle Level Science/Math Education major quality point average (MQPA):
All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Math/English and Elementary Education—113 hours

Liberal Arts Core (27 hours):
History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; Psychology 102; Science 201 or Physics lab course; Science 202 or Biology lab course; and Science 203 or Chemistry lab course.

Math/English Content (18 hours):
Three MATH prefix courses (9 hours); and three COMM/ENGL prefix courses (9 hours) choosing from the following: English 203, 204, 222, 261, 302, 351, 352, 402, Communication Arts 104, 225, 235, or 378.

Education Core Requirements (53 hours):
Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 441, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Dual Certification in Elementary Education Requirements (15 hours):
Art 321; Exercise Science 228; Music Education 315; Psychology 209; Education 281, 328, 342, 343.

Courses that count in the Middle Level Math/English and Elementary Education major quality point average (MQPA):
All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Math/History and Elementary Education—114 hours

Liberal Arts Core (27 hours):
History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; Psychology 102; Science 201 or Physics lab course; Science 202 or Biology lab course; and Science 203 or Chemistry lab course.

Math Content (9 hours):
Three MATH prefix courses.

Education Core Requirements (53 hours):
Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 441, 444, 488; and Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Dual Certification in Elementary Education Requirements (15 hours):
Art 321; Exercise Science 228; Music Education 315; Psychology 209; Education 281, 328, 342, 343.

Courses that count in the Middle Level Math/History and Elementary Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Science/English and Elementary Education—108 hours

Liberal Arts Core (15 hours):
History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; and Psychology 102.

Science/English Content (25 hours):
Science 201 or Physics lab course; Science 202 or Biology lab course; Science 203 or Chemistry lab course; one additional four-credit science course; and three COMM/ENGL prefix courses (9 hours) choosing from the following: English 203, 204, 222, 261, 302, 351, 352, 402, Communication Arts 104, 225, 235, or 378.

Education Core Requirements (53 hours):
Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 441, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Dual Certification in Elementary Education Requirements (15 hours):
Art 321; Exercise Science 228; Music Education 315; Psychology 209; Education 281, 328, 342, 343.

Courses that count in the Middle Level Science/English and Elementary Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Science/History and Elementary Education—99 hours

Liberal Arts Core (9 hours):
Math 151, 152; and Psychology 102.

Science/History Content (22 hours):
History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Science 201 or Physics lab course; Science 202 or Biology lab course; Science 203 or Chemistry lab course; and one additional four-credit science course.

Education Core Requirements (53 hours):
Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 441, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Dual Certification in Elementary Education Requirements (15 hours):
Art 321; Exercise Science 228; Music Education 315; Psychology 209; Education 281, 328, 342, 343.

Courses that count in the Middle Level Science/History and Elementary Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Middle Level Science/Math and Elementary Education—108 hours

Liberal Arts Core (15 hours):
History 253; one of History 204, 283, 285, 317, 318, 334, 336, 349 or 357; Mathematics 151, 152; and Psychology 102.

Science/Math Content (25 hours):
Three MATH prefix courses (9 hours); Science 201 or Physics lab course; Science 202 or Biology lab course; Science 203 or Chemistry lab course; and one additional four-credit science course.

Education Core Requirements (53 hours):
Education 202*, 203, 204, 228, 323, 324, 325, 326, 327, 329, 381, 382, 441, 444, 488; Special Education 101. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Dual Certification in Elementary Education Requirements (15 hours):
Art 321; Exercise Science 228; Music Education 315; Psychology 209; Education 281, 328, 342, 343.

Courses that count in the Middle Level Science/Math and Elementary Education major quality point average (MQPA):

All courses with "EDUC" prefix and SEDU 101. A minimum MQPA of 2.00 is required to graduate. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

INTEGRATIVE SCIENCE TECHNOLOGY ENGINEERING AND MATHEMATICS K-12 ENDORSEMENT PROGRAM (INTEGRATIVE STEM ENDORSEMENT)

The Integrative Science, Technology, Engineering, and Mathematics K-12 Endorsement Program is intended to improve a teacher's skills in dealing with complex classroom settings in the emerging area of STEM Education. This endorsement may be added to existing Level I or Level II Certificates.

To be admitted into a STEM Endorsement Program, candidates must be enrolled in an approved Level I program or hold a Level I or II certificate. Completion of the STEM Endorsement Program may include completing courses outside of the regular fall and spring semester offerings (such as summer and January terms).

Course requirements for an Integrative STEM Education Endorsement (12 hours)

An endorsement in Integrative STEM Education will consist of Education 510, 511, 512, and 513.

EDUCATION (EDUC)

EDUC 202. INTRODUCTION TO THE TEACHING PROFESSION. A study of the pedagogical framework of education with emphasis on the legal and organizational issues related to American institutions of education. This includes an analysis of the current reform movements and in impact upon the role of the professional educator. Education majors must complete and may only receive credit for one of Education 202 or the combination of Education 205 and 206.

Semester course, three hours.

EDUC 203. CULTURALLY RELEVANT PEDAGOGY. A study of the characteristics and educational needs of learners from diverse cultural backgrounds. The course is designed to equip educators with methods to address the educational needs of culturally diverse groups and students from limited English backgrounds. This course satisfies the Information Literacy (IL) requirement for PreK-4 Elementary and Middle Level Education majors. Prerequisites: Education 202 and Psychology 102. For education majors only. *Semester course, three hours.*

EDUC 204. TECHNOLOGIES OF INSTRUCTION. An introduction to educational media with an emphasis on applications of computer technology in education; general models for computer usage in education and educational institutions; and case studies of specific projects in terms of approach, effectiveness, and implications for the future. Emphasis will be on the application of educational media and technology within the K-12 school curriculum. For education majors only.

Semester course, three hours.

EDUC 205. OVERVIEW OF THE TEACHING PROFESSION. A study of the pedagogical framework of education with emphasis on the legal and organizational issues related to American institutions of education. This includes an analysis of the current reform movements and impact upon the role of the professional educator. Education majors must complete and may only receive credit for one of Education 202 or the combination of Education 205 and 206. Prerequisite: Dual Enrollment Program students only. *Spring semester course, two hours.*

EDUC 206. CLINICAL INTRODUCTION TO THE TEACHING PROFESSION. A classroom extension of Education 205 with a focus on face to face teaching and the required in-school field experience. Education majors must complete and may only receive credit for one of Education 202 or the combination of Education 205 and 206. Prerequisite: Education 205.

Fall semester course, one hour.

EDUC 215. SECONDARY CURRICULUM AND INSTRUCTION I. This course provides an overview of all curriculum components essential for operating a secondary education classroom. Major curriculum approaches are explored, and students are expected to complete unit planning skills implementing these approaches. Additional focus will be on classroom management strategies, school setting and culture, selecting course materials, and introduction to professionalism/ethics. Prerequisites: Education 202 and Psychology 102. *Semester course, two hours.*

EDUC 228. SURVEY OF ADOLESCENT LITERATURE. A survey of young adult literature for educators teaching in upper elementary, middle grades (4-8) with an extensive representation of books from classic and contemporary authors. Major literary genres are studied, trends in adolescent literature are discussed, and issues in selecting and using literature in the 4-8 classrooms are explored. Priority given to Middle Level and English Secondary Education Certification majors.

Spring semester only, two hours.

EDUC 260. INDEPENDENT STUDY. Individual study of specialized topics in education. Sophomore standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

EDUC 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in education. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

EDUC 281. EARLY CHILDHOOD FIELD EXPERIENCE (FIRST LEVEL). This one-credit field experience is an internship course designed to permit beginning level early education students to engage in a semester-long field experience in the Early Education Center. This course is required for Early Childhood certification. Freshman or sophomore level course. *Semester course, one hour.*

EDUC 305. BASIC PRINCIPLES OF CURRICULUM AND INSTRUCTION. This course is divided into sections by specific secondary certification areas. The course is designed to prepare secondary credential candidates with the ability to apply basic concepts of curriculum and instruction in their specific discipline and to use a wide variety of strategies for planning, conducting, and evaluating units of instruction. The course places emphasis on the materials being used in the secondary classrooms and includes classroom management; instructional materials selection; reading in the content areas; lesson presentation and critique; and conferencing techniques. This course is limited to students who have been admitted to and are in good standing in the credentials program. This course is to be taken the semester before the actual student teaching experience and taken concurrently with specific methods courses (Education 306-310). *Semester course, three hours.*

EDUC 306. FIELD EXPERIENCE/METHODS OF TEACHING MATHEMATICS. A study of the methods, materials, organization of subject matter, and professional perspective of mathematics instruction in the secondary schools. Designed to complement and expand upon the skills developed in curriculum and instruction. An extensive clinical field experience is a required part of this course. Prerequisite: Junior or senior standing. Corequisite: Education 305. *Semester course, two hours.*

EDUC 307. METHODS OF TEACHING MODERN LANGUAGES. A course designed to familiarize students with both theoretical and practical aspects of teaching foreign languages: listening, speaking, reading, writing, and culture. Designed to complement and expand upon skills developed in curriculum and instruction. Corequisite: Education 305. *Fall semester only, three hours.*

EDUC 308. FIELD EXPERIENCE/METHODS OF TEACHING ENGLISH AND COMMUNICATION. A study of the methods, materials, organization of subject matter, and professional perspective of English and communication instruction in the secondary schools. Designed to complement and expand upon the skills developed in curriculum and instruction. An extensive clinical field experience is a required part of this course. Corequisite: Education 305. *Semester course, two hours.*

EDUC 309. FIELD EXPERIENCE/METHODS OF TEACHING SCIENCE. A study of the methods, materials, organization of subject matter, and professional perspective of science instruction in the secondary schools. Designed to complement and expand upon skills developed in curriculum and instruction. An extensive clinical field experience is a required part of this course. Corequisite: Education 305. *Spring semester only, two hours.*

EDUC 310. FIELD EXPERIENCE/METHODS OF TEACHING THE SOCIAL SCIENCES. A study of the methods, materials, organization of subject matter, and professional perspective of social science instruction in the secondary schools. Designed to complement and expand upon skills developed in curriculum and instruction. An extensive clinical field experience is a required part of this course. Corequisite: Education 305. *Semester course, two hours.*

EDUC 316. SECONDARY ENGLISH/HISTORY/FOREIGN LANGUAGE CURRICULUM AND INSTRUCTION II. This course provides English, History and Foreign Language secondary education majors with an advanced implementation of planning and instruction in secondary classrooms. Topics will include literacy in the content area, motivation, management techniques and English/history/foreign language-specific teaching strategies. Topics discussed will be implemented through an imbedded field that will require English, History and Foreign Language preservice teachers

to demonstrate the implementation of topics. Students will also complete an advanced examination of Educational professionalism and ethics. Prerequisite: Education 215. *Semester course, two hours.*

EDUC 317. SECONDARY MATH/SCIENCE CURRICULUM AND INSTRUCTION II. This course provides Math and Science secondary education majors with an advanced implementation of planning and instruction in secondary classrooms. Topics will include literacy in the content area, motivation, management techniques, and math/science-specific teaching strategies. Topics discussed will be implemented through an imbedded field that will require math and science preservice teachers to demonstrate the implementation of topics. Students will also complete an advanced examination of Educational professionalism and ethics. Prerequisite: Education 215. *Semester course, two hours.*

EDUC 323. TEACHING PRIMARY AND ELEMENTARY LITERACY. A course designed to acquaint future elementary and early childhood teachers with strategies for developing emergent literacy in reading and the integrated language arts. Topics include methods to develop print awareness, decoding ability, and reading extended text. The course will also explore the developmental continuum of language and literacy, including writing, speaking, listening, visualizing and viewing. Direct field experience is required in the elementary school where students will utilize assessment techniques, plan lessons, and use a variety of approaches and materials in instructing students. Prerequisites: Sophomore standing elementary and special education majors, junior elementary education and middle level majors, or with special permission from the course instructor and completion of Education 202, Psychology 102, and one other methods course. Elementary Education, Middle Level Education, and Special Education majors only. *Fall semester only, three hours.*

EDUC 324. TEACHING ELEMENTARY SOCIAL SCIENCES. A study of resources and methods of teaching PreK-8 social studies including history, geography, civics, and economics. This course also emphasizes the development of competencies associated with the use of audio-visual equipment and materials. Directed field experience in the elementary and middle schools is required. Prerequisite: Sophomore standing. *Semester course, three hours.*

EDUC 325. TEACHING ELEMENTARY SCIENCE AND HEALTH. A course of instruction in methods of teaching PreK-8 science, health, and physical education. Includes classroom development of competencies in the planning and use of hands-on materials and application in classroom instruction. Directed field experience in the elementary and middle schools is required. Prerequisite: sophomore standing. *Semester course, three hours.*

EDUC 326. TEACHING UPPER ELEMENTARY/MIDDLE LITERACY. A course designed to acquaint elementary, early childhood, and English education majors about methods to teach literacy (reading and the integrated language arts) to upper elementary and middle school level students. Topics include methods to develop vocabulary knowledge, comprehension, expressive writing, and content area reading. Direct field experience in elementary or middle schools is required. Prerequisites: Junior or senior standing for PreK-4 majors, or special permission from course instructor; elementary majors must have completed Education 202, 323, 327; and Psychology 102; English majors must have sophomore standing and must have completed Education 202, and Psychology 102. Restricted to elementary education, English Secondary Education Certification, and Middle Level majors only. *Spring semester only, three hours.*

EDUC 327. TEACHING ELEMENTARY MATHEMATICS. Elementary mathematics concepts and pedagogy will be introduced within the framework of the curriculum and evaluation standards recommended by the National Council of Teachers of Mathematics. Mathematical strands to be explored include geometry; measurement; number sense; whole number operations; patterns and functions; fraction and decimal operations; graphing; statistics; and probability. A strong emphasis will be placed on problem solving as a skill needed to make informed decisions about life. All concepts will be taught with a dependence on manipulative activities. The scope of the course goes from early childhood to adolescence. A structured field experience is embedded within the course. It is strongly recommended that this course be completed before taking additional three-credit elementary methods courses. Prerequisite: Sophomore standing. *Semester course, three hours.*

EDUC 328. CHILDREN'S LITERATURE AND LANGUAGE. A survey of children's literature for early childhood, intermediate, and middle grades with an extensive representation of books from classic and contemporary authors and illustrators. Major literary genres are studied, story-telling techniques are discussed, and issues in literature for children are explored. Additionally, the course discusses the linguistic development in children that is fostered through exposure to literature. Open to PreK-4 and middle certification majors only. Priority given to PreK-4 majors. Prerequisite: Psychology 102. *Semester course, two hours.*

EDUC 329. MIDDLE LEVEL CURRICULUM AND INSTRUCTION. This course provides middle level certification candidates with an in-depth study of middle level education that focuses on meeting the needs of adolescent learners. Topics will include the role of collaboration in departmentalized middle level programs, adolescent guidance, management of the learning environment, and school governance in middle and junior high settings. Prerequisite: Psychology 102. *Fall semester only, three hours.*

EDUC 330. LITERATURE AND WRITING FOR THE SECONDARY CLASSROOM. A course designed to familiarize the student with both theoretical and practical aspects of teaching literature and writing used at the secondary level. Included will be a discussion of literature selection, treatment of the material, and writing assessment procedures. Traditional works will be emphasized. Prerequisites: Education 202 and Psychology 102. *Fall semester only, three hours.*

EDUC 342. EARLY CHILDHOOD CURRICULUM AND INSTRUCTION. This course provides an overview of all curriculum components essential for operating an early childhood classroom with a focus on preschool and primary environments. Major curriculum approaches explored and implemented in early childhood settings include a traditional structured approach, a thematic approach, and the project approach. An awareness of learning styles, diversity, and special needs are integral to effective planning. The role of assessment in the curriculum sequence is included. Students are required to implement curriculum approaches in selected sites. Sophomore or junior level course. Prerequisites: Education 281 and Psychology 102. *Semester course, three hours.*

EDUC 343. TRENDS AND ISSUES IN EARLY CHILDHOOD EDUCATION. This course examines contemporary trends and issues surrounding early childhood education discussing sociological, psychological, political, and economic forces shaping contemporary families, children, and schooling. Current educational practices, curriculum, and administration of programs are integral topics included in this study. Senior level course. Prerequisites: Education 281 or Special Education 203, and Education 342. *Semester course, three hours.*

EDUC 350. EDUCATION FOR THE MISSION FIELD. This course seeks to provide students with the opportunity to learn more about the philosophy and structure of international, missional, and national schools. A strong focus will be provided on how to partner with nationals to advance their own teaching abilities. Students will have the opportunity to interact with several alumni who are currently teaching on the mission field. The final component of the course will be a service-learning project for a mission school. *Alternate years, spring semester only, one hour.*

EDUC 360. INDEPENDENT STUDY. A course designed to permit students to do advanced study or to participate in educational experiences that provide an opportunity for professional and/or educational self-improvement. Junior standing, permission of the department chair and a faculty sponsor are required. *Semester course, one, two or seven hours.*

EDUC 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in education. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

EDUC 371. SECONDARY FIELD EXPERIENCE (FIRST LEVEL). An internship course designed to help pre-service secondary and K-12 teachers observe and collaborate with experienced teachers to gain the knowledge and practice necessary to effectively teach in a secondary classroom. Key components include actively observing and critically reflecting upon elements of successful

planning and preparation, classroom environment, instructional delivery, professional conduct, assessment, and knowledge of diverse learners. Prerequisites: Education 202 and Psychology 102. *Semester course, one hour.*

EDUC 375. SECONDARY FIELD EXPERIENCE (THIRD LEVEL). An internship course designed to help pre-service secondary and K-12 teachers actively collaborate with experienced teachers to gain the knowledge and practice necessary to effectively teach in a secondary classroom. Included in this collaboration is successful planning and preparation that meets the needs of diverse learners and is closely tied to assessment practices, the maintenance of an effective learning environment through the examination and implementation of successful classroom management strategies, the use of effective instructional delivery techniques, the demonstration of professional conduct, and the knowledge of professional development opportunities and requirements. Prerequisite: Education 215. Suggested concurrent with Education 316 or 317. *Semester course, one hour.*

EDUC 381. ELEMENTARY FIELD EXPERIENCE (FIRST LEVEL). An internship course designed to permit students to engage in a thirty to forty-hour entry-level field experience in an elementary school. Field experience interns observe experienced teachers in classroom settings noting organizational structures, curriculum issues, and students' development. Diverse educational settings are strongly encouraged. Prerequisite: Psychology 102. *Semester course, one hour.*

EDUC 382. ELEMENTARY FIELD EXPERIENCE (SECOND LEVEL). An internship course designed to permit students to engage in thirty to forty hours of observational and participatory field experience in an elementary school. Field experience interns observe teachers in classroom settings **and** assume some level of teaching responsibility. Diverse educational settings are strongly recommended. Prerequisite: Education 381. Corequisite: Education 323. *Semester course, one hour.*

EDUC 383. ELEMENTARY FIELD EXPERIENCE (THIRD LEVEL). An internship course designed to permit students to engage in thirty to forty hours of observational and participatory field experience in an elementary school. Field experience interns observe teachers in classroom settings **and** assume some level of teaching responsibility. Diverse educational settings are strongly recommended. Prerequisite: Education 382. *Semester course, one hour.*

EDUC 385. EARLY CHILDHOOD FIELD EXPERIENCE (SECOND LEVEL). This one-credit **second** field experience is an internship course designed to permit students who desire to gain additional experience working with young children to engage in a semester-long field experience in the Early Education Center. Sophomore or junior level course. Prerequisite: Education 281. *Semester course, one hour.*

EDUC 386. EARLY CHILDHOOD FIELD EXPERIENCE (THIRD LEVEL). This two-credit **third** field experience is an internship course designed to permit students more in-depth experience in studying and teaching young children. Students may choose between Education 385 and 386 for a second field experience in early childhood. Sophomore or junior level course. Prerequisites: Education 281 and 385. *Semester course, two hours.*

EDUC 387. FIELD EXPERIENCE IN EDUCATION. A field-based course designed to permit students to engage in approximately twenty-one hours of field experience that fulfills the requirements of a Level I, Level II, or Level III field experience course. With instructor approval, this course may substitute for Education 371, 372, 373, 381, 382, or 383. Prerequisite: Education 202, Education 205, or Psychology 102. With instructor permission the course may be taken more than once. *Intersession or online term only, one hour.*

EDUC 390. STUDIES: SPECIAL TOPICS COURSE. This course is taught by a visiting scholar from the field of education. The topic for each course will vary from year to year. The course will consist of a minimum of two two-hour lectures on the topic plus a paper of specified length related to the topic. Prerequisite: Junior or senior education majors. *Semester course, one, two or three hours.*

EDUC 431. STUDENT TEACHING, SECONDARY. Secondary credential candidates (seniors) student teach at the junior/middle school and/or high school levels in the public secondary schools five days per week for one semester and attend one practicum session per week.
Semester course, sixteen hours.

EDUC 432. STUDENT TEACHING, SECONDARY. Secondary credential candidates (seniors) student teach at the junior/middle school and/or high school levels in the public secondary schools five days per week for one half of a semester and attend one practicum session per week. Departmental permission required. *One-half semester course, eight hours.*

EDUC 441. ELEMENTARY STUDENT TEACHING, PRIMARY GRADES. Senior level Elementary Education candidates student teach full time in PreK and elementary public schools for seven weeks in a primary classroom (pre-kindergarten, kindergarten, first, second, or third grade) and attend one practicum session per week. *One-half semester course, eight hours.*

EDUC 442. STUDENT TEACHING MIDDLE LEVEL I. Senior level Middle Education candidates student teach full-time in an upper elementary/middle public school for seven weeks in a classroom serving upper/elementary or early middle school learners (grades 4, 5, 6). In addition to student teaching responsibilities, Middle Education candidates also attend one practicum session per week. Prerequisites: Senior standing and completion of all methodology courses required for middle level certification. *One-half semester course, eight hours.*

EDUC 443. ELEMENTARY STUDENT TEACHING, INTERMEDIATE GRADES. Senior level Elementary Education credential candidates student teach full time in the elementary public schools for seven weeks in an intermediate classroom (fourth, fifth, or sixth grade) and attend one practicum session per week. *One-half semester course, eight hours.*

EDUC 444. STUDENT TEACHING MIDDLE LEVEL II. Senior level Middle Education candidates student teach full-time in a middle/junior high public school for seven weeks in a classroom serving upper/elementary or early middle school learners (grades 6, 7, 8). In addition to student teaching responsibilities, Middle Education candidates also attend one practicum session per week. Prerequisites include senior level standing and completion of all methodology courses required in middle level certification. *One-half semester course, eight hours.*

EDUC 460. INDEPENDENT STUDY. A course designed to permit students to do advanced study or to participate in educational experiences that provide an opportunity for professional and/or educational self-improvement. Senior standing, permission of the department chair and a faculty sponsor are required. *Semester course, one, two or seven hours.*

EDUC 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in education. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

EDUC 480. INTERNSHIP IN EDUCATION. An opportunity for junior or senior level education majors to participate in approved experiences that provide extraordinary leadership roles in applying educational theory to practice, under the supervision of an on-site manager and a department faculty member. Products of the internship include a log, evaluation by the on-site manager, and all other requirements established within the faculty approved Contract of Expected Responsibilities and Outcomes. Prerequisites: Acceptable standing within the Education Department and permission of the Chair or Associate Chair of the Education Department. *Semester course, one to six hours.*

EDUC 488. SEMINAR: ISSUES IN EDUCATION/COMPARATIVE EDUCATION. A capstone course for **senior** credential candidates that re-examines the major philosophical, historical, social, political, and psychological issues as they impact the teaching profession. Successful educational practices from various countries of the world will be studied as the student considers possible solutions to the crisis facing American education today. This course satisfies the Writing Intensive (WI), Speaking Intensive (SI) and Information Literacy (IL) requirement for all education majors.
Semester course, three hours.

SPECIAL EDUCATION (SEDU)

SEDU 101. EXCEPTIONAL LEARNERS. This course is a foundational study of the characteristics, etiology, and psychological and educational needs of individuals eligible for special education services, focusing on the implication of such needs on the educator and meeting of individual needs in a standards-aligned system. The course also introduces students to the processes, professionals, and strategies for identifying individual needs and the establishment and delivery of required special education services. An embedded special education field experience is part of this course. Prerequisites: Psychology 102 and appropriate clearances. *Semester course, three hours.*

SEDU 102. EXCEPTIONAL LEARNERS FOR 7-12 & K-12. This course is a foundational study of the characteristics, etiology, and psychological and educational needs of individuals eligible for special education services, focusing on the implication of such needs on the educator and meeting of individual needs in a standards-aligned system. The course also briefly introduces pre-service teachers to the processes, professionals, and strategies for identifying individual needs and the establishment & delivery of required special education services. A particular focus will be on the implementation of identification, implementation, and inclusion in the secondary classroom. Prerequisite: Education 215.
Semester course, two hours.

SEDU 103. METHODS OF SECONDARY SPECIAL EDUCATION IMPLEMENTATION. The course is an expansion and implementation of previous coursework for K-12, 7-12 and Special Education Majors that will focus on co-teaching, full inclusion, assessment writing & modification, and co-curricular experiences. This course will include one-credit of classroom instruction and one credit of field experience. Prerequisite: Education 215. It is acceptable to take Special Education 102 and 103 concurrently. *Semester course, one hour.*

SEDU 202. BEHAVIORAL INTERVENTIONS. Topics include assessment and intervention with a focus on ethics and methods to increase and decrease behaviors. Students will carry out behavioral analyses and intervention to design and implement individual and group behavior plans for special education populations while gaining proficiency in developing pro-social behaviors and in direct instruction to explicitly teach appropriate social skills and communication. Furthermore, students will implement intervention strategies appropriately in compliance with IEP goals with respect for student safety and individual needs. Prerequisites: Psychology 102, Special Education 101, and appropriate clearances and standing in the certification program at Grove City College. Corequisite: Special Education 203. *Fall semester only, three hours.*

SEDU 203. SPECIAL EDUCATION SYSTEMS AND PROCESSES/FIELD EXPERIENCE LEVEL I. This field experience-based course will provide the prospective teacher with opportunities to interact and instruct students with Special Education labels as they work with both Regular Education and Special Education teachers. Student-interns enrolled in this field will function as skilled observers/explorers and pre-student teacher tutors as they collect information and prepare and deliver lessons to small groups and individual students while spending at least 35 hours in the field, focusing on the special education process, LRE, Participation in a Standards Aligned Curriculum, and Behavioral Interventions. Prerequisites: Psychology 102, Special Education 101, and appropriate clearances and standing in the certification program at Grove City College**.** Corequisite: Special Education 202, as assignments from that course will be tied to this field experience.
Fall semester only, one hour.

SEDU 204. EDUCATIONAL ASSESSMENT IN SPECIAL EDUCATION. This is an in-depth study of the tools and processes used in identification of and programming for the Exceptional Population. Expertise will be developed in the implementation of unbiased multiple-layered assessment tools and their subsequent application in IEP programming. Students will become proficient in providing and evaluating in-depth authentic, benchmark, diagnostic, formative, screening, and summative assessment data related to meeting the needs of those being considered for or identified within the special education population. Prerequisites: Psychology 102, Special Education 101, and appropriate clearances and standing in the certification program at Grove City College.
Spring semester only, three hours.

SEDU 205. CONSULTATION, LITIGATION, AND TRANSITION. Students will prepare skills for building productive professional interactions with parents, educators, service providers, and community professionals. Additionally, historical cases and current litigation will be studied to enable students to design and implement programs that provide full procedural safeguards to all constituents while gaining expertise in aligning resources, securing providers, and mediating forces to provide for the full spectrum of support services both legally and ethically. Prerequisites: Psychology 102, Special Education 101, and clearances and standing in the certification program at Grove City College.
Spring semester only, three hours.

SEDU 306. SUPPORTIVE SERVICES AND TECHNOLOGY / FIELD EXPERIENCE LEVEL II. This field experience-based course will provide the student-intern with opportunities to interact and instruct students with Special Education Labels as they work with both Regular Education and Special Education teachers. Specifically, this experience will be selected to provide a 25-hour experience with students receiving special education services under the labels of moderate to severely handicapped. Prerequisites: Psychology 102; Special Education 101, 202, 203, 204, 205; and appropriate clearances and standing in the certification program at Grove City College. Corequisite: Special Education 307, as assignments from that course will be tied to this field experience. *Fall semester only, one hour.*

SEDU 307. EVIDENCE BASED INSTRUCTION OF LOW INCIDENCE DISABILITIES Students will develop advanced skills in meeting the needs of special education students with labels of Autistic, Visually Impaired/Blind, Hearing Impaired/Deaf, Multiple Handicapped, Severe Disabilities, Orthopedic Impairments, and Traumatic Brain Injury. Students will demonstrate knowledge of facilitating inclusion, managing the environment, and the use of available technology to design and implement programs, while continuously monitoring progress, providing remediation and compensation techniques, and providing alternative routes to achievement across all areas of the continuum of services. Prerequisites: Psychology 102; Special Education 101, 202, 203, 204, 205; and appropriate clearances and standing in the certification program at Grove City College. Corequisite: Special Education 306. *Fall semester only, three hours.*

SEDU 308. READING DISABILITIES. This is an advanced level course in literacy methods aimed at preparing students to meet the needs of the special education population who experience difficulty in literacy development. Students will study research-based findings related to the causes and research-based strategies on ameliorating such difficulties. Key components of the course focus on the appropriate use of materials, assessment instruments, teaching strategies, and a variety of service delivery models to optimize the success of individual students. This course also includes an ongoing clinical field experience throughout the semester in which students will collaborate with a practicing special educator of reading specialist to work with a student with literacy needs. Prerequisites: Psychology 102, Special Education 101 or 102, Education 323; and appropriate clearances and standing in the certification program at Grove City College. *Fall semester only, three hours.*

SEDU 309. EVIDENCE BASED INSTRUCTION OF HIGH INCIDENCE DISABILITIES. Students will develop advanced skills in meeting the needs of special education students with labels of Learning Disabled, Speech and Language Impaired, Mentally Retarded/Cognitively Impaired, Seriously Emotionally Disturbed, and Attention Deficit Disorder (Other Health Impaired). Students will demonstrate knowledge of facilitating inclusion, managing the environment, and the use of available technology to design and implement programs. As appropriate, students will provide integrated learning experiences, multiple instructional approaches, and evidence-based decisions.

Prerequisites: Psychology 102; Special Education 306, 307; Education 323, 326; and appropriate clearances and standing in the certification program at Grove City College. Corequisite: Special Education 310. *Spring semester only, three credits.*

SEDU 310. EFFECTIVE PRACTICES AND DELIVERY/ FIELD EXPERIENCE LEVEL III. This field experience-based course will provide students with opportunities to interact and instruct students with Special Education Labels as they work with both Regular Education and Special Education teachers. Specifically, this 25-hour experience will be selected to provide experience with Special Education students with labels considered as High Incidence Disabilities. Prerequisites: Psychology 102; Special Education 306, 307; Education 323, 326; and appropriate clearances and standing in the certification program at Grove City College. Corequisite: Special Education 309. *Spring semester only, one hour.*

SEDU 411. SPECIAL EDUCATION STUDENT TEACHING. Student teaching is a capstone rigorous experience that provides the opportunity to practice and demonstrate the practices of a competent Special Education teacher under the supervision of a certified Special Educator. At the completion of the student teaching experiences, student teachers are expected to demonstrate mastery in implementing the competencies that have been developed from coursework. Student teachers who achieve the necessary competencies will be recommended for special education certification. Issuance of certification will hinge on the completion of all graduation and certification requirements, including student teaching, and must be initiated by the teaching candidate through the office of the College Certifying Officer. Pre-requisites: All special education coursework (other than SEDU 412) must be successfully completed and the teacher candidate must have the approval of the Department Chair. Other prerequisites include appropriate clearances and standing in the certification program at Grove City College. Corequisites: Special Education 412 and Education 441. Students will spend one half of the semester in the special education student teaching assignment and one half of the semester completing PreK-4 student teaching. *Semester course, eight hours.*

SEDU 412. PRACTICUM OF PROFESSIONAL DEVELOPMENT. As an extension of the student teaching experience, student teachers will participate in a practicum experience including course work, assignments, and interaction with the college supervisor while exploring topics that are important to the development of the Professional Special Educator. Thus, the course will support the student teacher in applying theory to practice during the student teaching experience. Additionally, topics of professional responsibilities, confidentiality issues, and current issues in special education will be discussed. Corequisite: Special Education 411. *Semester course, one hour.*

SEDU 413. SPECIAL EDUCATION STUDENT TEACHING II. Continuation of the capstone Special Education student teaching experience. Prerequisites: Special Education 411. *Semester course, eight hours.*

INTEGRATIVE SCIENCE TECHNOLOGY ENGINEERING AND MATHEMATICS K-12 ENDORSEMENT PROGRAM (INTEGRATIVE STEM ENDORSEMENT)

EDUC 410 (Undergraduate) / 510 (Post-baccalaureate). INTEGRATIVE STEM FOR EARLY CHILDHOOD AND ELEMENTARY SCHOOL. This course focuses on STEM topics, methods, curriculum and instruction for school students in early childhood grades PreK-4 and elementary school settings. In this course, students will (a) Gain exposure to the standards knowledge of standards that are pivotal in the STEM field, (b) Explore how STEM can be involved in other disciplines and used in cross curricular activities and lessons, and (c) Explore inquiry-based teaching and learning methodologies to teach STEM topics - explore each topic (science, technology, engineering, and math) individually and explore methodologies that work within each topic area. In addition, students will participate in a field component where they will design, implement, and reflect using the reflective teaching model on lessons and units that incorporate an integrative STEM learning cycle approach and developmentally appropriate methodology for PREK-4 students. This course is in partial fulfillment of the STEM endorsement from PDE. *Semester course, online only, three hours.*

EDUC 411 (Undergraduate) / 511 (Post-baccalaureate). INTEGRATIVE STEM FOR ADOLESCENT AND MIDDLE SCHOOL. This course focuses on STEM topics, methods, curriculum and instruction for school students in grades 4-8. The course is designed for candidates seeking an endorsement in Integrative Science, Technology, Engineering, and Mathematics Education. In this course, students will (a) Apply knowledge of standards that are pivotal in the STEM field, (b) Create cross curricular lessons, and (c) Apply inquiry-based teaching and learning methodologies to teach STEM topics. In addition, students will participate in a field component where they will design, implement, and reflect using the reflective teaching model on lessons and units that incorporate an integrative STEM learning cycle approach and developmentally appropriate methodology for 4-8 students. Prerequisite: EDUC 510. This course is in partial fulfillment of the STEM endorsement from Pennsylvania Department of Education. *Semester course, online only, three hours.*

EDUC 412 (Undergraduate) / 512 (Post-baccalaureate). INTEGRATIVE STEM FOR SECONDARY AND HIGH SCHOOL. This course focuses on STEM topics, methods, curriculum and instruction for school students in secondary settings, grades 9-12. In this course, students will (a) utilize their knowledge of the standards to create and implement lesson plans in the field, (b) Explore hot topics in STEM education such as robotics and 3D printing (c) Gain hands on experience with technology tools related to STEM education. In addition, students will participate in a field component where they will design, implement, and reflect using the reflective teaching model on lessons and units that incorporate an integrative STEM learning cycle approach and developmentally appropriate methodology for 9-12 students. Prerequisite: EDUC 511. This course is in partial fulfillment of the STEM endorsement from Pennsylvania Department of Education.

Semester course, online only, three hours.

EDUC 413 (Undergraduate) / 513 (Post-baccalaureate). STEM PRACTICUM AND APPLIED LEADERSHIP. A capstone course designed to integrate previously learned concepts in other STEM endorsement classes through a long-range service project and teaching experience in a PreK-12 setting. The course is designed to develop the ability to endorsement candidates to integrate previously learned content and dispositions to have a dynamic impact on schools and the field of education. Critical course components include engagement with STEM community partners from business and industry outside of the PreK-12 settings, developing recourses for the PreK-12 setting, and furthering the promotion of STEM teaching and learning as an instructional leader. The course covers broad themes: STEM in Society and Professions, STEM Education, and STEM Educational Leadership. The capstone course will be structured with a weekly practicum meeting for the total cohort, but the individual students will each be partnered with a STEM cooperating educator or cooperating school administrator AND a mentor professor from institution. The STEM capstone class is a rigorous internship for the educator in a high school, middle school, intermediate, primary, and/or early childhood classroom. All placements must be approved by the course instructor. This course is in partial fulfillment of the STEM endorsement from PDE. *Semester course, online only, three hours.*

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Dr. M. W. Bright, Chair; Dr. Brooks, Dr. Christman, Dr. Mohr, Dr. Rumbaugh.

Electrical and Computer Engineering Department Mission Statement, Objectives, and Outcomes

Electrical and Computer Engineering (ECE) is the analysis, design, and application of devices and systems for conversion, processing, and transmission of electrical energy and information. Electrical and Computer Engineering at Grove City College now covers such basic topics as electric circuits, electronics, electrical machines, signal analysis, and digital systems; as well as advanced topics in communication systems, computer systems, and control systems. Electrical and computer engineers practice in a variety of professional duties including research, design and development, management, sales, field service, testing, manufacturing, and education.

The Electrical and Computer Engineering Department at Grove City College offers a program leading to the Bachelor of Science in Electrical Engineering (BSEE) degree. The electrical engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Proficiency in writing and speaking skills is essential to a productive career in any branch of Electrical and Computer Engineering. To that end, all majors take Electrical Engineering 401 (Electrical/Computer Engineering Design), as a Writing Intensive (WI) and Speaking Intensive (SI) course. In addition, all graduates need to know how to obtain, evaluate, and use technical information related to the field of Electrical and Computer Engineering. Instruction and practice in these Information Literacy (IL) skills is provided in the combination of the following required courses: Electrical Engineering 202, 251, and 351.

Electrical Engineering Program Educational Objectives

1. Graduates will be active in the electrical engineering profession or an alternative field consistent with their God-given calling. Many of our graduates will assume leadership roles as a result of having demonstrated strong technical abilities as well as communication and team skills.
2. Graduates will set career goals and engage in life-long learning through self-study, continuing education courses, and/or formal graduate education in order to reach those goals.
3. Graduates will demonstrate ethical behavior in the workplace and will carry out their professional duties in a manner that is consistent with a Christian life perspective.

Student Outcomes

To ensure fulfillment of the ECE Department objectives, graduates of the EE program shall demonstrate:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Inherent in the ECE curriculum at Grove City College is the inculcation of design experience. Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process applying basic science, mathematics, and engineering science to use available resources to optimally meet stated objectives. In the EE program, engineering design is assured via design problems and projects integrated throughout the ECE curriculum.

Freshman Year-The *Introduction to Engineering* (ENGR 156) course introduces the profession of engineering and the design process. Students work in teams on a design project and present results in written and oral reports.

Sophomore and Junior Years-ECE students are afforded additional opportunities to solve relevant design problems through homework and group design projects in various courses in the sophomore and junior years. Design projects that incorporate course-specific topics along with techniques introduced in the freshman *Introduction to Engineering* course are assigned in *Digital Logic Design* (ELEE 204), *Electric Machines* (ELEE 303), and *Microcontrollers with Robotic Applications* (ELEE 310), and other courses as appropriate. These projects are presented in written and/or oral reports.

Senior Year-The integrated design experience in ECE at Grove City College culminates in the senior year with the capstone design project. The capstone design experience comprises a combination of research and proposal writing in *Electrical/Computer Engineering Design* (ELEE 401) and *Capstone Design Project I* (ELEE or ROBO 451) in the fall semester of the senior year and hands-on implementation and documentation of that design in *Capstone Design Project II* (ELEE or ROBO 452) in the spring semester. The project must incorporate one or more advanced topics chosen from the senior-level stem sequences in Communication Systems, Computer Systems, or Control Systems (students choosing the CE concentration must include the Computer Systems sequence). Since stem courses build on fundamentals presented in previous ECE courses, the capstone project assures that all ECE graduates complete a major design experience drawing on fundamental concepts as well as advanced ECE topics. While seniors are asked to present various oral and written updates throughout the capstone experience, the climax comes in the second semester of the senior year when students present oral and written reports to the public, including engineering professionals from nearby industries.

Course Requirements for Bachelor of Science Degree in Electrical Engineering—99-100 hours

Electrical Engineering/Computer Core (28 hours)

Computer Science 141; Electrical Engineering 201, 204, 251, 252, 301, 304, 321, 351, 401; Electrical Engineering or Robotics 451 and 452.

Engineering Core (7 hours)

Engineering 156, 301, 402, and Mechanical Engineering 120.

Math/Science Core (30-31 hours)

Chemistry 105 or Biology 101; Mathematics 161, 162, 261, 262; Engineering 274 or Mathematics 214; and Physics 101 and 102.

Concentration Area—choose one:

Electrical Engineering Concentration (EEEE)—(34 hours):

- Electrical Engineering 202, 302, 303, and 352 (10 hours).
- Math/science elective (3-4 hours): Choose one course from the following: Astronomy 206, 207; Biology 101, 102; Chemistry 227, 241, 345; Mathematics 210, 213, 222, 331; Physics 234, or 402.
- Technical electives* (15 hours): Select 15 hours from any 200-400 level Electrical Engineering, Engineering, Robotics, Mechanical Engineering, or Computer Science course, excluding Electrical Engineering 210 and Computer Science 205.
- Advanced electives* (6 hours): Select six hours from Electrical Engineering 404, 432, 442, or Engineering 412.

Computer Engineering Concentration (EECE)—(33 hours):

- Electrical Engineering 310, 441, 442; Computer Science 220, 222, 340 (18 hours)

- Math/science elective (3 hours): Choose one course from the following: Astronomy 206, 207; Biology 102; Chemistry 227, 241, 345; Mathematics 210, 213, 222, 331; Physics 234, or 402.
- Technical electives* (9 hours): Select 9 hours from any 200-400 level Electrical Engineering, Engineering, Robotics, Mechanical Engineering, or Computer Science course, excluding Electrical Engineering 210 and Computer Science 205.
- Advanced elective* (3 hours): Select one of Electrical Engineering 404, 432, or Engineering 412.

**No course can be used to satisfy both the technical and advanced elective requirements*.

Courses that count in the Electrical Engineering major quality point average (MQPA):
All courses with "ELEE" and "ROBO" prefix; ENGR 390; COMP 141, 220, 222, 340, and 450. A minimum MQPA of 2.00 is required to graduate.

FOUR-YEAR PLAN for ELECTRICAL ENGINEERING CONCENTRATION

FRESHMAN YEAR	**1st Sem.**	**2nd Sem.**	**SOPHOMORE YEAR**	**1st Sem.**	**2nd Sem.**
Mathematics 161-162	4	4	Mathematics 261-262	4	3
Physics 101	-	4	Physics 102	4	-
Humanities 102 - Writing 101	3	3	Electrical Engineering 201-202	3	3
Physical Education 100	-	1	Electrical Engineering 204	-	3
Computer Science 141	-	3	Electrical Engineering 251-252	1	1
Engineering 156	2	-	Electrical Engineering 321	-	3
Chemistry 105 or Biology 101	4	-	Math/Science Elective	-	3
Mechanical Engineering 120	3	-	Humanities 200	3	-
	16	15	SSFT course	2	-
				17	16
JUNIOR YEAR			**SENIOR YEAR**		
Electrical Engineering 301-302	3	3	Electrical Engineering 401	3	-
Electrical Engineering 303-304	3	3	Electrical Engineering 451-452	1	3
Electrical Engineering 351-352	1	1	Engineering 402	-	1
Engineering 301	1	-	Technical Electives	6	3
Technical Electives	3	3	Advanced Electives	-	6
Math 214 or Engineering 274	-	3	Humanities 303	-	3
Social Science course	3	-	Free Electives	5	-
Humanities 301-202	3	3		15	16
	17	16			

FOUR-YEAR PLAN for COMPUTER ENGINEERING CONCENTRATION

FRESHMAN YEAR	**1st Sem.**	**2nd Sem.**	**SOPHOMORE YEAR**	**1st Sem.**	**2nd Sem.**
Mathematics 161-162	4	4	Mathematics 261-262	4	3
Physics 101	-	4	Physics 102	4	-
Humanities 102 - Writing 101	3	3	Electrical Engineering 201	3	-
Physical Education 100	-	1	Electrical Engineering 204	-	3
Computer Science 141	-	3	Electrical Engineering 251-252	1	1
Engineering 156	2	-	Electrical Engineering 321	-	3
Chemistry 105 or Biology 101	4	-	Computer Science 220-222	3	3
Mechanical Engineering 120	3	-	Humanities 200	-	3
	16	15	SSFT course	2	-
				17	16

JUNIOR YEAR			**SENIOR YEAR**		
Electrical Engineering 301-304	3	3	Electrical Engineering 401	3	-
Electrical Engineering 310	-	3	Electrical Engineering 441-442	3	3
Electrical Engineering 351	1	-	Electrical Engineering 451-452	1	3
Engineering 301	1	-	Engineering 402	-	1
Technical Elective	3	-	Technical Electives	3	3
Social Science - Mathematics 214	3	3	Advanced Elective	-	3
Math/Science Elective	3	-	Humanities 303	-	3
Computer Science 340	-	3	Free Electives	6	-
Humanities 301-202	3	3		16	16
	17	15			

Course Requirements for a minor in Robotics (19-20 hours)

A minor in Robotics will consist of Robotics 301, 302; Engineering 301; a 3-4 credit robotics-related capstone project; and nine hours from Computer Science 445, Electrical Engineering 310, Engineering 411, Engineering 412, Mechanical Engineering 316, or Mechanical Engineering 410 or Engineering 390 Introduction to Mechatronics.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ENGINEERING CORE COURSES (ENGR)

ENGR 156. INTRODUCTION TO ENGINEERING. Introduces students to the engineering profession and the design process. Course lectures and assignments include the design process; problem definition and solution; oral and written communications; group dynamics; public responsibility; current global engineering challenges; and engineering ethics. A group design project is required. For mechanical engineering students, this course is taken concurrently with Mechanical Engineering 120. *Semester course, two hours.*

ENGR 274. MATHEMATICAL METHODS IN ENGINEERING. A course for engineering and science majors covering selected topics in probability and statistics, linear algebra, discrete mathematics, and numerical methods as applied to the solution of problems in engineering and science. Students who receive credit for Mathematics 213, 222, and 331 may not receive credit for Engineering 274. Prerequisite: Mathematics 162. S*emester course, three hours.*

ENGR 301. ETHICS IN ENGINEERING AND ROBOTICS. This course investigates ethical decision-making from a Christian perspective as it applies to engineering and robotics. It includes an overview of approaches to ethical decision-making, as well as particular issues raised by the robotics field, such as robots making military decisions, privacy issues with in-home robots, issues with emotional bonds, etc. *Semester course, one hour.*

ENGR 390. SPECIAL ENGINEERING TOPICS. Special topics in the areas of new engineering development based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration.
Semester course, one, two, three or four hours.

ENGR 402. ENGINEERING ECONOMY. Principles and methods for analyzing the economic feasibility of engineering projects including interest, depreciation, rate-of-return, economic life, replacement costs, and comparison of alternative designs. Aspects of this course will be involved in the final phase of Senior Capstone projects. Prerequisite: Mathematics 141 or 161; junior or senior standing. *Spring semester only, one hour.*

ENGR 411. CONTROL SYSTEMS. A study of the design and analysis of feedback control systems using classical techniques. Topics include modeling of mechanical and electrical dynamic systems, a review of Laplace transform techniques, steady-state error, transient response, stability, root locus

design methods, Bode analysis/stability margins, and Bode compensator design. Includes MATLAB/Simulink simulations and hands-on projects. Prerequisite: Electrical Engineering 210 or 201; Mechanical Engineering 316 or Electrical Engineering 321; and Engineering 274, Mathematics 214, or Mathematics 222. *Fall semester only, three hours.*

ENGR 412. MODERN CONTROL THEORY. Analysis and design of feedback control systems using modern control modeling and design techniques. Topics include state space modeling of mechanical and electrical systems, design of state-space controllers and observers, Kalman filtering, and an introduction to advanced topics such as robust control, optimal control (LGR/LQG), and others. Includes MATLAB/Simulink simulations and hands-on projects. Prerequisite: Engineering 411. *Spring semester only, three hours.*

ENGR 480. INTERNSHIP IN ENGINEERING. An opportunity for junior or senior engineering majors to participate in an extended work experience (six months or more) under the supervision of an on-site manager and a department faculty member. Products of the internship will include an evaluation by the on-site manager, a journal of the internship experience, and a paper describing the experience and relating it to academic theory. This course may be repeated a maximum of three times. Prerequisite: Permission from the department chair. *Semester course, one hour.*

ELECTRICAL ENGINEERING (ELEE)

ELEE 201. LINEAR CIRCUITS I. An introduction to the analysis and design of electrical circuits composed of linear elements. The course begins with time domain analysis of the steady state and transient behavior of linear circuits and progresses to sinusoidal steady state analysis using the phasor method. Computers are introduced as an aid to analysis and design of circuits via the use of circuit simulation software. Prerequisites: Mathematics 162. Corequisite: Electrical Engineering 251. *Fall semester only, three hours.*

ELEE 202. LINEAR CIRCUITS II. Continued study in techniques for analyzing and designing circuits composed of linear elements, including the Laplace Transform, convolution, and Fourier analysis methods. Applications of linear circuits to electric power systems and frequency selective systems are examined. Computers are used as an aid to analysis and design via the use of circuit simulation software. Electrical Engineering 202 is designed to fulfill the requirements for the Information Literacy (IL) instruction in the Electrical and Computer Engineering curriculum. Prerequisites: Electrical Engineering 201. *Spring semester only, three hours.*

ELEE 204. DIGITAL LOGIC DESIGN. An introduction to digital circuit analysis and design methods. Combinational circuit topics include the use of Boolean algebra, map minimization methods, and circuit implementation with logic gates and standard integrated circuits. Sequential circuit design is explored, and implementation with flip-flops and standard integrated circuits is investigated. Programmable logic implementation of both combinational and sequential circuits is introduced. A group design project is required. Corequisite: Electrical Engineering 252. *Spring semester only, three hours*.

ELEE 210. ELECTRICAL ENGINEERING. A survey for non-electrical engineering majors covering the basic principles of circuit analysis, electronics, instrumentation, and electromechanical energy conversion, with computer applications. Prerequisites: Mathematics 162, Physics 102, and Mechanical Engineering 120 or Computer Science 141. *Three hours.*

ELEE 251. LINEAR CIRCUITS LABORATORY. A laboratory course intended to acquaint the student with basic techniques of instrumentation, measurement, design, and troubleshooting for linear analog circuits. Laboratory investigation of basic Electrical Engineering concepts is integrated with design and implementation of practical circuits to meet specifications. Electrical Engineering 251 is designed to fulfill the requirements for the Information Literacy (IL) instruction in the Electrical and Computer Engineering curriculum. Corequisite: Electrical Engineering 201. *Fall semester only, one hour.*

ELEE 252. DIGITAL CIRCUITS LABORATORY. A laboratory course intended to acquaint the student with hardware and software tools used for the design and implementation of digital circuits. A variety of digital design techniques are investigated, including gate-level circuits, programmable FPGA devices, and hardware definition languages (VHDL). CAD software, a hardware target system, and lab equipment are used to design, simulate, program, and verify the operation of digital circuits. Computers are used to design and simulate circuits and to program digital devices to implement those designs. Corequisite: Electrical Engineering 204. *Spring semester only, one hour.*

ELEE 260. INDEPENDENT STUDY. Individual study of specialized topics in electrical engineering. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

ELEE 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in electrical engineering. Sophomore standing, permission of the department chair, and a faculty sponsor are required. O*ne, two or three hours.*

ELEE 301. ELECTRONICS I. A study of semiconductor device characteristics, diodes, bipolar junction transistors (BJTs), field-effect transistors (FETs), BJT and FET amplifier circuits, bias stability, and DC power supplies. Prerequisites: Electrical Engineering 201 and Mathematics 262. Corequisite: Electrical Engineering 351. *Fall semester only, three hours.*

ELEE 302. ELECTRONICS II. A study of the frequency response characteristics of transistor amplifiers, integrated-circuit operational amplifiers, fundamentals of feedback and stability, oscillators, active filters, quasi-linear circuits, pulsed waveforms and timing circuits. Prerequisite: Electrical Engineering 301. Corequisite: Electrical Engineering 352.
Spring semester only, three hours.

ELEE 303. ELECTRICAL MACHINES. Theories of transformers, DC machines, induction motors, synchronous motors and generators, stepping motors, and single-phase motors are developed, and applications are explored. Prerequisite: Electrical Engineering 202. *Three hours.*

ELEE 304. ELECTROMAGNETIC THEORY. Fundamentals of electromagnetic theory, including static electric fields; dielectrics; energy and forces in the electric field; magnetic fields in free space and in magnetic materials; time-varying fields; and Maxwell's equations with applications. Computer techniques are used to solve a problem involving Laplace's Equation. Prerequisite: Mathematics 262.
Three hours.

ELEE 306. DESIGN OF DIGITAL SYSTEMS. A study of semiconductor devices and their use in digital integrated circuits. Characteristics of semiconductor devices will be explored followed by an investigation of their application to the design of digital logic circuits and systems. Prerequisite: Electrical Engineering 204. *Three hours.*

ELEE 310. MICROCONTROLLERS WITH ROBOTIC APPLICATIONS. An introduction to the skills required to design and program systems that incorporate embedded microprocessors or microcontrollers. Topics include microprocessor circuitry and architecture, programming using assembly and higher-level languages, and interfacing the microprocessor with external devices. Three lectures and one lab per week. Prerequisites: Electrical Engineering 201 or 210, and Electrical Engineering 204. *Three hours.*

ELEE 321. SIGNAL ANALYSIS. The mathematical representation of continuous and discrete systems including Fourier Series and transforms; Laplace transforms; z-transforms; continuous and discrete convolution; and digital computer techniques such as FFT's and digital filtering. Prerequisite: Electrical Engineering 201. Corequisite: Mathematics 262. *Three hours.*

ELEE 351. INTERMEDIATE LABORATORY I. A hands-on experience in the use of electronic devices including discrete active and passive components and sub-assemblies; test equipment; and instrumentation. Assignments are oriented toward the analysis and design of analog electronic circuits

and systems. Computer software is used for circuit simulation and analysis. Familiarization with the technical resources available in the library is also provided. Electrical Engineering 351 is designed to fulfill the requirements for the Information Literacy (IL) instruction in the Electrical and Computer Engineering curriculum. Corequisite: Electrical Engineering 301. *Fall semester only, one hour.*

ELEE 352. INTERMEDIATE LABORATORY II. A hands-on experience in the use of electronic and electrical devices including transformers, motors, and generators as well as discrete active and passive components, test equipment, and instrumentation. Assignments are oriented toward the analysis and design of analog electronic circuits, networks, and electrical machines. Computer software is used for circuit simulation and analysis. Corequisites: Electrical Engineering 302.
Spring semester only, one hour.

ELEE 360. INDEPENDENT STUDY. Individual study of specialized topics in electrical engineering. Junior standing, permission of the department chair, and a faculty sponsor are required.
One, two or three hours.

ELEE 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in electrical engineering. Junior standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

ELEE 390. SPECIAL TOPICS IN ELECTRICAL ENGINEERING. Special topics, based on student demand and faculty interest, in the areas of new electrical engineering development. Specific subject matter varies each semester. Prerequisites and credit hours announced in advance of registration. *One, two, three, or four hours.*

ELEE 401. ELECTRICAL/COMPUTER ENGINEERING DESIGN. A study of the principles and methods of designing electrical/computer engineering systems in today's society. The early stages of the design process are emphasized, including identifying needs, requirements specification, planning and evaluating design alternatives. Engineering ethics, including intellectual property, are a significant focus. The senior design project is initiated, defined and documented. Extensive technical writing and oral presentation skills are employed. Electrical Engineering 401 is designed to fulfill the requirements for the Writing Intensive (WI) and the Speaking Intensive (SI) instruction in the Electrical and Computer Engineering curriculum. Prerequisite: Senior standing in electrical engineering (either electrical or computer concentration). *Fall semester only, three hours.*

ELEE 404. ELECTROMAGNETIC ENERGY TRANSMISSION. The analysis of the transmission of electromagnetic energy including radiation in free space and in various media, guided waves in transmission lines, and antennas. Each student completes an antenna design project as part of this course. Prerequisite: Electrical Engineering 304. *Three hours.*

ELEE 431. COMMUNICATION SYSTEMS I. Analysis and design of digital and analog communication systems. An investigation of the techniques for improving system performance in transmitting voice, video, and data, over both noisy wired and wireless channels. A variety of techniques are investigated, including modulation, channel coding, equalization, and detection. Students are required to simulate the design using MATLAB. Matlab/Simulink simulations. Prerequisite: Electrical Engineering 321. *Fall semester only, three hours.*

ELEE 432. COMMUNICATION SYSTEMS II. An advanced study of the communication systems applications. Applications include satellite, cellular, digital television & radio, fiber-optic, and wired & wireless data networks. System performance will be investigated using the link budget. Selected topics in leading-edge technologies are explored such as software-defined radio and software communication architecture. Prerequisites: Electrical Engineering 431.
Spring semester only, three hours.

ELEE 441. COMPUTER ARCHITECTURE. An advanced study of Central Processing Unit (CPU) organization and architecture. The Instruction Set Architecture (ISA) and Instruction Level Parallelism (ILP) are emphasized. The organization and importance of the memory hierarchy, particularly cache

memory, are introduced. Modern CPU architectures, such as the Intel IA-32 architecture, are used as practical examples of theoretical concepts. A design project is required. Prerequisite: Electrical Engineering 204. *Three hours.*

ELEE 442. PARALLEL COMPUTER ARCHITECTURE. An advanced study of multiprocessor architectures. Different approaches to memory, interconnection network and CPU design are explored. The nature and limitations of massively parallel applications are explored. Design of large-scale storage systems is introduced. Selected topics in leading-edge computer system design are explored, such as quantum computing or wireless sensor networks. Students are required to research selected topics in the academic literature. Corequisite: Electrical Engineering 441.
Spring semester only, three hours.

ELEE 451. CAPSTONE DESIGN PROJECT I. An advanced lab course where students learn techniques and engage in experiments relating to their senior group design project. Written reports and oral presentations are required. Prerequisite: Senior standing in engineering or permission of the instructor. *Fall semester only, one hour.*

ELEE 452. CAPSTONE DESIGN PROJECT II. An advanced lab course requiring student teams to complete their group design project. Written reports and oral presentations are required. Electrical Engineering is designed to fulfill the requirements for a Speaking Intensive (SI) instruction in the Electrical and Computer Engineering curriculum. Prerequisite: Senior standing in engineering and one of Electrical Engineering, Mechanical Engineering, or Robotics 451.
Spring semester only, three hours.

ELEE 460. INDEPENDENT STUDY. Individual study of specialized topics in electrical engineering. Senior standing, permission of the department chair, and a faculty sponsor are required.
One, two or three hours.

ELEE 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in electrical engineering. Senior standing, permission of the department chair, and a faculty sponsor are required. *One, two or three hours.*

ROBOTICS (ROBO)

ROBO 101. INTRO TO ROBOTICS. A hands-on introduction to the science and engineering involved in mobile robots. Fundamentals of robot hardware and software are explored and reinforced with weekly hands-on projects culminating in a final project competition. Prerequisites: Freshman standing; Algebra I course in high school. *Fall semester only, one hour.*

ROBO 301. INDUSTRIAL ROBOTICS. Presents the fundamentals of robot mechanisms, kinematics, dynamics, and controls. Topics include forward and inverse kinematics, differential motion and velocities, dynamics and force control, path and trajectory planning, actuators and drive systems, and sensors used in robotic systems. The basics of robotic control systems are briefly presented. The use of vision systems in robotics is introduced. Two lectures and one lab per week. Prerequisite: Electrical Engineering 321 or Mechanical Engineering 316, robotics minor, or permission of instructor. *Fall semester only, three hours.*

ROBO 302. MOBILE ROBOTS. An introduction to the basic principles of mobile robots, including mechanical, sensory, and cognitive systems necessary for successful operation. Topics will include hardware, locomotion, sensors, control schemes, localization, and navigation. Hands-on lab experiences with real robots and a final project supplement lecture material. Two lectures and one lab per week. Prerequisites: Physics 101; Mathematics 261; and Engineering 274 or Mathematics 214.
Spring semester only, three hours.

ROBO 451. CAPSTONE DESIGN PROJECT I. An advanced lab course where students learn techniques and engage in experiments relating to their senior group design project. Written reports and

oral presentations are required. Prerequisite: Senior standing in engineering or permission of the instructor. *Fall semester only, one hour.*

ROBO 452. CAPSTONE DESIGN PROJECT II. An advanced lab course requiring student teams to complete their group design project. Written reports and oral presentations are required. Robotics 452 is designed to fulfill the requirements for the Speaking Intensive (SI) course in the Electrical and Computer Engineering or Mechanical Engineering major. Prerequisite: Senior standing in engineering and one of Electrical Engineering, Mechanical Engineering, or Robotics 451.
Spring semester only, three hours.

DEPARTMENT OF ENGLISH

Dr. Mayo, Chair; Dr. Bilbro, Mrs. Craig, Dr. Harvey, Dr. Loretto, Dr. Messer, Dr. E. Potter, Dr. Rawl, Dr. Waha. Adjunct: Dr. Barbour. Additional Instructional Faculty: Mrs. Philson.

The Department of English sets high standards for its students in the development of composition and research skills necessary for writing clear, well-supported research papers in MLA format for each literature course in the program. To this end, all freshman English majors take English 201: English Literature Survey and Literary Studies I as the foundational Writing Intensive (WI) and Information Literacy (IL) course in the major. Oral communication skills are essential to success in graduate school as well as in careers related to English, and English 351 or 352: Shakespeare serves as the required Speaking Intensive (SI) course in the department.

Course Requirements for a Bachelor of Arts Degree in English—39 hours

English Core Requirements (24 hours):
English 201, 202, 203, 204, 302, 485; English 205, 206, or 250; and English 351 or 352.

English Period Electives (6 hours):
Choose six hours from English 304, 306, 308, 312, 314, 318, 320, or 325. Note: only one of ENGL 320 or 325 can be counted toward these six hours.

English Genre/Tradition Electives (9 hours):
Choose nine hours from English 221, 222, 224, 226, 242, 243, 245, 246, 252, 254, 261, 262, 324, 327, or 356.

Courses that count in the English major quality point average (MQPA):
All courses with "ENGL" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Arts Degree in English and Secondary Education Certification—85 hours

Core Requirements (30 hours):
English 201, 202, 203, 204, 302, 402, 485; English 205, 206, or 250; English 351 or 352; and Writing 271 or 281.

English Electives (6 hours):
Choose two additional ENGL prefix courses; at least one of which must be 300-level or higher.

Education Requirements (49 hours):
Education 202*, 203, 204, 215, 316, 326, 330, 371, 375, 431, 488; Psychology 102; Special Education 102, 103; and Communication Arts 104. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Course Requirements for a Bachelor of Arts Degree in English and Communication Secondary Education Certification—91 hours

Core Requirements (30 hours):

English 201, 202, 203, 204, 302, 402, 485; English 205, 206, or 250; English 351 or 352; and Writing 271 or 281.

English Electives (6 hours):

Choose two additional ENGL prefix courses; at least one of which must be 300-level or higher.

Education Requirements (49 hours):

Education 202*, 203, 204, 215, 316, 326, 330, 371, 375, 431, 488; Psychology 102; Special Education 102, 103; and Communication Arts 104. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Communication Core (6 hours):

Choose six (6) hours from any *one* of the following three areas:

Speech: Communication Arts 109 (one credit course must be taken three times), 207, 303; Theatre 251 or 255.

Media: Communication Arts 110, 135, 222, 235, or 378.

Theatre*: Theatre 251, 259 (one credit course must be taken three times), 261, 262, 320; or English 252.

**Students who elect the "Theatre" option must take English 250 as one of their English elective courses.*

Note: Advanced Placement credits in English do not count toward the requirements for majors within the English Department. They will, however, count as general elective credits toward graduation.

SUPPORTING ACTIVITIES

The Department of English offers students significant co-curricular activities including:

- A highly acclaimed theatre program, including two main stage productions and numerous student productions during the academic year.
- Lambda Iota Tau (LIT), the literary honor society on campus, sponsors special speakers and poetry readings.
- Tau Alpha Pi (TAP), the theatre honorary, sponsors a One-Act Play Festival each semester.
- Involvement with the campus newspaper (*The Collegian*), radio station (WSAJ), literary magazines (*The Echo* and *The Quad*), yearbook (*The Bridge*), or the College's public relations offices.
- Internships, whereby students earn academic credit for work done in conjunction with a professional organization related to English. See the course description for English 480.

Course Requirements for a minor in Creative Writing (21 hours)

A minor in Creative Writing will consist of Writing 315 or an approved Writing 390 course; Writing 305 or 310; four courses from Writing 271, 272, 281, 320, 359, 382, 383, or 384; and one genre literature course from English 230, 242, 243, 245, 246, 250, 252, 261, or 262.

Course Requirements for a minor in English (18 hours)

A minor in English will consist of any six three-credit ENGL literature courses.

Course Requirements for a minor in Musical Theatre (21 hours)

A minor in Musical Theatre will consist of Music 103, 105, 161 or 162 (minimum 3 credits); Music 222, Music or Theatre 210, Theatre 251, and six additional hours choosing from Music 161, 162, 222, Physical Education 211, 213, 290 Jazz & Tap, Theatre 262, 320, and 351. Note: All prospective Musical Theatre minors must pass an audition before being admitted into the Musical Theatre minor program.

Course Requirements for a minor in Theatre (24 hours)

This minor is open to all students with a love for theatre and an interest in supplementing their academic major with a program that will develop appreciation of dramatic literature and skills in the various arts and crafts of the theatre. Twenty-four hours are required, including:

Theatre Core (12 hours):

English 250; Theatre 251, 261, and 259 (taken three times).

Elective options (12 hours) Choose twelve hours from the following:

English 252, 302, 351, or 352; Theatre 255, 262, 320, 351, or 384. English or Theatre 260, 290, 360, 390, 460, or 480 courses may also count as elective options but must be pre-approved by the department chair and must relate directly to theatre studies.

Course Requirements for a minor in Writing (21 hours)

A minor in Writing will consist of Writing 305* or 310; Writing 315; one 300-level Writing course (excluding 305 and 310) or a Writing or Communication Arts internship; and twelve hours choosing from two writing track options:

1. Professional Writing Track: Four courses from Communication Arts 135, 235, 300, 378, Writing 271 or 281, and Entrepreneurship or Marketing 328.
2. Technical Writing Track: Three courses from Design 101, 210, and Communication Arts 378; and one course from Computer Science 141, 155, 205, and Electrical Engineering 204. *Note: Writing 305 must be completed by students pursuing the Technical Writing Track.

Course Requirements for a concentration in Business Writing (15 hours)

A concentration in Business Writing will consist of Writing 310, 315, 320; Entrepreneurship or Marketing 328; and one course to be selected from Accounting 303, Entrepreneurship or Management 303, Entrepreneurship 467, Marketing 204, 315, and Management 214.

Course Requirements for a concentration in Creative Writing (15 hours)

A concentration in Creative Writing will consist of Writing 271, 315, 320; and two courses to be selected from Writing 281, 382, 383, 384, and Communication Arts 359.

Course Requirements for a concentration in Professional Writing (15 hours)

A concentration in Professional Writing will consist of Writing 305 or 310; Writing 315, 320; and one course from Communication Arts 135, 235, 300, and Entrepreneurship or Marketing 328.

Course Requirements for a concentration in Science Writing and Reporting (16-17 hours)

A concentration in Science Writing and Reporting will consist of Writing 305, 315; Writing 320 or Communication Arts 135 or 235; and two courses to be selected from Biology 101, 102, Chemistry 105, 111 and 112, 113, 114, Computer Science 155, Physics 101, 102, 121, 122, and Psychology 204.

Course Requirements for a concentration in Technical Writing (15-16 hours)

A concentration in Technical Writing will consist of Writing 305, 315; Design 101, 210; and one course to be selected from Astronomy 206, 207, Biology 101, Chemistry 105, Chemistry 111 and 113, Computer Science 141, 155, 205, Electrical Engineering 204, Physics 101, and 121.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ENGLISH (ENGL)

ENGL 201. ENGLISH LITERATURE SURVEY AND LITERARY STUDIES I. The first semester of the two-semester survey of English literature focuses on the major authors and representative works of each period from the early Middle Ages (*Beowulf)* to the 18th century. It also introduces students to major interpretive/critical schools of thought, as well as such foundational literary practices as close reading, analysis, and scansion. This course also fulfills the Writing Intensive (WI) and Information Literacy (IL) requirements for the English major. As such, it is the foundational course for the English major and should be taken in the first semester of the program.

Fall semester only, three hours.

ENGL 202. ENGLISH LITERATURE SURVEY AND LITERARY STUDIES II. Elaborating upon the content, practices, and interpretive modes introduced in English 201, the second semester of the two-semester survey of English literature focuses on the major authors and representative works of each period from the late 18th century to the modern era. Prerequisite: English 201.

Spring semester only, three hours.

ENGL 203. AMERICAN LITERATURE SURVEY I. The first semester of the two-semester survey of American literature focuses on representative works from the time of the discovery of America to the Civil War. Attention is concentrated on major writers and their works in each period with some consideration given to all genres except drama. English majors are strongly encouraged to take 203 before 204. *Fall semester only, three hours.*

ENGL 204. AMERICAN LITERATURE SURVEY II. The second semester of the two-semester survey of American literature focuses on representative works from post-Civil War to the late 20th century. Attention is concentrated on major writers and their works in each period with some consideration given to all genres except drama. Non-English majors may enroll in 204 without having taken 203, but English majors are strongly encouraged to take 203 before 204.

Spring semester only, three hours.

ENGL 205. WORLD LITERATURE SURVEY: ASIA. A survey of representative authors and works of Asia, with a special focus on the literature of China, India, and Japan. The 205-206 survey is designed to include works of cultures and regions not covered by the English and American literature surveys or the classical and European literature in the required Humanities 202: Civilization & Literature. Students may take either or both courses, in either sequence.

Fall semester only, three hours.

ENGL 206. WORLD LITERATURE SURVEY: AFRICA AND LATIN AMERICA. A survey of representative authors and literary works of Africa and Latin America, including the Caribbean. The 205-206 survey is designed to include works of cultures and regions not covered by the English and

American literature surveys or the classical and European literature in the required Humanities 202: Civilization & Literature. Students may take either or both courses, in either sequence.
Spring semester only, three hours.

ENGL 221. SCIENCE FICTION. This course introduces students to the many ways science fiction engages a range of cultural and social issues, such as the nature of science and scientific exploration, science and ethics, scientific dystopia, technological apocalypse, relationships between faith and science, cybernetics and human identity, transhumanism, medical ethics, and nanotechnology.
Alternate years, semester course, three hours.

ENGL 222. **FANTASY LITERATURE.** This course is designed to introduce students to the major features that characterize fantasy as a literary genre. Students will read 16-18 fantasy novels, including authors such as C. S. Lewis, J. R. R. Tolkien, Madeleine L'Engle, Ursula LeGuin, and J. K. Rowling. Class time will be spent analyzing these novels and critiquing them as works of literature.
Alternate years, spring semester only, three hours.

ENGL 224. ARTHURIAN LITERATURE. This survey course follows King Arthur across the centuries and literary genres from his seminal appearances in medieval histories and literature to latter interpretations – Victorian, Modernist, Inkling, and post-modernist in English and American prose fiction, film, and poetry. Authors include, but are not limited to, Chretien de Troyes, Thomas Malory, Tennyson, Twain, Eliot, C.S. Lewis, Charles Williams, the Wizard Tim, and Malamud.
Alternate years, semester course, three hours.

ENGL 226. GOTHIC LITERATURE. This course is a historical survey of Gothic literature from the eighteenth to the twentieth century, focusing mainly on literary Gothicism of Europe and America. The course also explores how films and other literary genres have appropriated Gothic elements in the twentieth and twenty-first centuries. *Alternate years, semester course, three hours.*

ENGL 242. 19th CENTURY ENGLISH NOVEL. A study of major works by authors from the great age of the English novel, including Austen, the Brontes, Dickens, Eliot, Hardy, Conrad, and Wilde. Prerequisite English 202 or by permission. *Alternate years, fall semester only, three hours.*

ENGL 243. 20th CENTURY ENGLISH NOVEL. A study of the themes and technical developments which emerge in the novels of such authors as Woolf, Forster, Joyce, Waugh, Greene, and selected contemporary authors. Prerequisite English 202 or by permission.
Alternate years, spring semester only, three hours.

ENGL 245. 19th CENTURY AMERICAN NOVEL. This course explores the romances of Hawthorne and Melville; the realism of Mark Twain, Henry James, and Chopin; and the naturalism of Dreiser, along with works by other key writers. Prerequisite: English 203 and 204 or by permission.
Alternate years, fall semester only, three hours.

ENGL 246. 20th CENTURY AMERICAN NOVEL. This course gives students experience with the long fiction of such writers as Cather, Hemingway, Faulkner, Fitzgerald, Ellison, Morrison, Percy, and others. Prerequisite: English 204 or by permission. *Alternate years, spring semester only, three hours.*

ENGL 250. WORLD DRAMA. An introduction to the great playwrights and representative plays of world drama from the Greeks to the present. Students study elements of plot, characterization, and idea in each of the plays studied. The course also focuses on the theatrical and historical context of each play and playwright. *Fall semester only, three hours.*

ENGL 252. MODERN DRAMA. A study of major plays and playwrights of the late nineteenth and twentieth centuries, including Ibsen, Chekhov, Shaw, O'Neill, Beckett, Stoppard, and recent American and British playwrights. *Alternate years, spring semester only, three hours.*

ENGL 254. PAGE TO STAGE. Students will travel to a major theatre venue such as New York City (Broadway and Off-Broadway shows); Niagara-on-the-Lake, Canada (Shaw Festival); Staunton, VA

(American Shakespeare Center); Stratford, Canada (Stratford Festival); or various other global cities that have large theatre centers. Students will read and be quizzed on selected plays prior to travel. While there, students will attend three to five plays, attend daily post-play discussion sessions and workshops, and keep a guided response journal. Upon their return, students will submit a four to five-page paper as their final exam. Cost of the trip will vary depending on location.
Travel course, offered periodically, one to three hours.

ENGL 260. INDEPENDENT STUDY. Individual study of specialized topics in English. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ENGL 261. POETRY. This course explores a wide range of traditional and contemporary poetry; gives insight into ways poets use imagery, rhyme, meter, persona, and sound qualities to create meaning in poetry; provides experience with prosody and offers in-depth experience with the work of selected poets. *Fall semester only, three hours.*

ENGL 262. MODERN POETRY. This course provides a more intensive examination of the poets and poetry of the 20th century. Students will examine the most significant movements in poetry of this period, including Modernism in the first half of the century and post-modern experiments of recent decades. *Alternate* years, *spring semester only, three hours.*

ENGL 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in English. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ENGL 290. STUDIES IN LITERATURE. Subject matter varies each semester, to allow an in-depth study of authors and works of literature not covered in as much detail in other courses.
Semester course, three hours.

ENGL 302. CLASSICAL LITERATURE IN TRANSLATION. A study of the major works of ancient and medieval Greek, Roman, Latin, and Italian literature from Homer to Dante with particular emphasis on epic and tragedy. The influence of classical literature on later Western literature will also be considered. *Semester course, three hours.*

ENGL 304. CHAUCER AND THE MIDDLE AGES. An introduction to the literature and art of the Middle Ages, from *Beowulf*, through *Sir Gawain and the Green Knight* and *The Canterbury Tales*, to the religious drama of the later Middle Ages. Prerequisite: English 201.
Alternate years, semester course, three hours.

ENGL 306. ENGLISH RENAISSANCE: SPENSER TO MILTON. A survey of major English writers of the sixteenth and seventeenth centuries from Spenser, Donne, and Jonson to John Milton. Prerequisite: English 201 or by permission. *Alternate years, semester course, three hours.*

ENGL 308. RESTORATION AND 18th CENTURY LITERATURE. An introduction to the works of principle authors from 1660 to 1750 such as Dryden, Pope, Swift, and Johnson. The simultaneous codification of rules and outbreak of the Romantic temper will be traced. Prerequisite: English 201.
Alternate years, semester course, three hours.

ENGL 312. ROMANTIC LITERATURE. An intensive examination of the poetry of the six major English Romantic poets of the early nineteenth century: Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats. Students also read major critical prose by and about these poets. Prerequisite: English 202 or by permission. *Alternate years, semester course, three hours.*

ENGL 314. VICTORIAN LITERATURE. A study of the major British writers of the period from 1837 to 1900, focusing particularly on Tennyson, Robert Browning, Christina Rossetti, Gerard Manley Hopkins, and Oscar Wilde. Prerequisite: English 202. *Alternate years, semester course, three hours.*

ENGL 318. AMERICAN RENAISSANCE. An opportunity for students to explore an unusually productive phase in the history of ideas in America through literature of outstanding quality including works of Emerson, Thoreau, Hawthorne, Melville, and Whitman. The dynamics of interaction among members of that group will be studied. Prerequisite: English 203 or by permission.
Alternate years, semester course, three hours.

ENGL 320. SOUTHERN LITERATURE. With significant emphasis on the works of William Faulkner, this course explores the great flowering of literature in the American South in the twentieth century. Such writers as Robert Penn Warren, Richard Wright, Eudora Welty, Flannery O'Connor, and Walker Percy are also considered, especially as they seek to move beyond the "aesthetic of memory" that characterizes Faulkner's novels. *Offered periodically, semester course, three hours.*

ENGL 324. EUROPEAN LITERATURE. A study of European fiction in translation, with major emphasis on the novel, highlighting the work of writers such as Flaubert, Tolstoy, Dostoevsky, and Mann. *Alternate years, semester course, three hours.*

ENGL 325. CONTEMPORARY LITERATURE. A study of American, European and world literature of the last three decades, with particular emphasis on Nobel and other award-winning authors.
Alternate years, semester course, three hours.

ENGL 327. CHRISTIAN WRITERS. This course acquaints students with a wide variety of writers from the early twentieth century to the present whose works express and engage Christianity in significant ways. It examines the question of how Christians faithfully practice the discipline of reading and writing and offers students opportunities to develop their own creative and devotional practices. Operating on the premise that there is a place for many kinds of literary genius in the kingdom of God, this course challenges students intellectually and encourages them spiritually.
Alternate years, semester course, three hours.

ENGL 351. SHAKESPEARE I. One of two courses which together examine 20 of the 37 plays of William Shakespeare. Each semester begins with a study of the sonnets and then focuses on ten of the major plays, selected from the comedies, histories, tragedies and romances. Class discussion is supplemented with a required lab session for the viewing and discussion of performances of the plays under study. Either Shakespeare course will satisfy the Speaking Intensive (SI) requirements for the English major. Plays for the fall semester usually include *Richard III, Taming of the Shrew, Merchant of Venice, A Midsummer Night's Dream, Romeo and Juliet, Much Ado About Nothing, Henry V, Julius Caesar, Othello,* and *The Winter's Tale*. Students may take either or both courses, in either sequence. Prerequisite: English 202 or by permission. *Fall semester only, three hours.*

ENGL 352. SHAKESPEARE II. One of two courses which together examine 20 of the 37 plays of William Shakespeare. Each semester begins with a study of the sonnets and then focuses on ten of the major plays, selected from the comedies, histories, tragedies and romances. Class discussion is supplemented with a required lab session for the viewing and discussion of performances of the plays under study. Either Shakespeare course will satisfy the Speaking Intensive (SI) requirements for the English major. Plays for the spring semester usually include: *As You Like It, Twelfth Night, Richard II, 1 Henry IV, Measure for Measure, Hamlet, Macbeth, King Lear, Cymbeline,* and *The Tempest.* Students may take either or both courses, in either sequence. Prerequisite: English 202 or by permission. *Spring semester only, three hours.*

ENGL 356. LITERARY THEORY. A detailed examination of the major literary critics and theorists of Western civilization. Part one is devoted to key figures of the Classical tradition; Part two uses basic tenets of that tradition to engage and critique the "new wave" of 20th and 21st century critical theory. The class employs a seminar format; students lead discussion on a rotating basis and are expected to contribute significantly to every discussion. This course is strongly recommended for all students considering graduate study in English. Prerequisites: English 201, 202, 203, and 204, junior or senior English major; or by permission. *Spring semester only, three hours.*

ENGL 360. INDEPENDENT STUDY. An opportunity for students with extensive background in literature to do intensive independent study or research on specialized topics. Junior standing in the English Department, permission of the department chair, and a faculty sponsor are required. Application deadline: end of the semester preceding the proposed study.
Semester course, one, two or three hours.

ENGL 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in English. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ENGL 390. STUDIES IN LITERATURE. Subject matter varies each semester, to allow an in-depth study of authors and works of literature not covered in as much detail in other courses.
Semester course, three hours.

ENGL 402. GRAMMAR AND HISTORY OF ENGLISH. Required of English majors seeking secondary certification in English, this course offers an introduction to the history of the English language, a review of traditional grammar, and presentation of a working knowledge of modern grammar. *Semester course, three hours.*

ENGL 460. INDEPENDENT STUDY. An opportunity for students with extensive background in literature to do intensive independent study or research on specialized topics. Senior standing in the English Department, permission of the department chair, and a faculty sponsor are required. Application deadline: end of the semester preceding the proposed study.
Semester course, one, two or three hours.

ENGL 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in English. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

ENGL 480. INTERNSHIP IN ENGLISH. Students majoring in English may, with prior consent of the department, earn academic credit for work done (normally off campus) under the direct supervision of a professional in an English-related field. This includes but is not limited to such fields as publishing, library science, journalism, technical writing, and script writing. Students must keep a daily log of activities and submit an academic paper summarizing the experience. A maximum of six credits of internship may apply toward graduation. *Semester course, one to six hours.*

ENGL 485. SENIOR CAPSTONE. As a culminating experience for senior English majors, this seminar-style course provides students an opportunity to reflect on their college literary studies; to deepen their understanding of literature, its role in the pursuit of truth, and its place in their lives, especially as Christians; and to apply what they have learned as majors in completing a substantial project. This project will focus on a significant work, author, or literary topic and should reflect thorough research, thoughtful analysis, and clear communication. The course subject matter varies each semester to reflect the interests and expertise of the professor. Prerequisite: Senior status in the English program. *Semester course, three hours.*

ENGL 499. HONORS IN ENGLISH. Seniors who have shown special aptitude in literature may, with consent of the department, undertake this course on an individual basis. The format is similar to that of the independent study, but students must also submit their papers to the entire English faculty and provide an oral presentation and defense of their research.
Semester course, one, two or three hours.

THEATRE (THEA)

THEA 210. INTRODUCTION TO MUSICAL THEATRE. This class is a survey of the development of musical theatre as a performing art form in America from 1750 to the present. By looking at musical theatre from multiple perspectives - historical, cultural, political, social, aesthetic - the class will explore the ways in which musicals both reflect and embody values and trends of the

cultural landscape in which they were written. Included will be practical study of the format of the libretto and musical score in relationship to the major musical theatre genre. Students may only receive credit for one of Theatre 210 or Music 210. *Semester course, three hours.*

THEA 251. ACTING. Practice in preparing a dramatic role for performance. Exercises will focus on freeing the actor's voice and body for maximum expressiveness. Students will prepare and perform monologues, short scenes, and a single extended scene. *Fall semester only, three hours.*

THEA 255. ORAL INTERPRETATION OF LITERATURE. Study and practice of the techniques of reading literature aloud to enhance audience appreciation and enjoyment. Oral readings are given in the areas of fiction, poetry, and drama. Each student also prepares and performs a final ten-minute recital. *Fall semester only, three hours.*

THEA 259. THEATRE PRACTICUM. Students may receive one credit for a minimum of 40 hours of supervised technical theatre work directly related to a main-stage theatre production. Students must keep an ongoing record of the dates and times of their work, and the student's supervisor must sign each entry. These records are due by Study Day of the semester enrolled. This course is repeatable, but no more than three hours may count toward the Theatre minor. It will count as a general elective if taken more than three times. *Semester course, one hour.*

THEA 260. INDEPENDENT STUDY. An opportunity for students with extensive background in theatre to do intensive independent study or research on specialized topics. Sophomore standing with declared Theatre minor, permission of the department chair, and a faculty sponsor are required. Application deadline: end of the semester preceding the proposed study.
Semester course, one, two or three hours.

THEA 261. STAGECRAFT. This course covers the technical work of set-design, lighting, sound design, and stage rigging as well as administrative/budgetary management of technical theater. A practical course taught both in the classroom and in hands-on settings. Students will be required to assist in various productions and live performances throughout the semester. Note: for safety reasons, no minors may enroll in this course, and students should be aware that some lifting and handling of power tools is required. *Semester course, three hours*.

THEA 262. DESIGN FOR THE THEATRE. Focuses on the visual aspects of theatrical production, including set design, costume design, and lighting design. Through group and individual projects, students will work through the design process: analyzing the text, doing research, formulating a production concept, and applying the elements of design to create a visual world for the actors to inhabit. They will also practice the skills necessary to communicate their ideas to both a director and technical crews: drawing, drafting, model building, and organizational paperwork.
S*emester course, three hours*.

THEA 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in theatre. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

THEA 290. STUDIES IN THEATRE. Subject matter varies each semester, to allow an in-depth study of aspects of theatre not covered in as much detail in other courses.
Semester course, three hours.

THEA 320. STAGE DIRECTION. Theories and techniques of directing plays for the stage. Principles of play analysis, blocking, characterization, and rhythm are studied. The student will direct laboratory scenes, prepare production scripts, do script analyzes, and produce an extended scene. Prerequisite: Theatre 251. *Fall semester only, three hours.*

THEA 351. ADVANCED ACTING. Study and practice of advanced techniques of acting. Students will also focus on vocal production, movement, and elements of style related to the performance of plays from various periods of theatre history. Prerequisite: Theatre 251. *Semester course, three hours.*

THEA 360. INDEPENDENT STUDY. An opportunity for students with extensive background in theatre to do intensive independent study or research on specialized topics. Junior standing with declared Theatre minor, permission of the department chair, and a faculty sponsor are required. Application deadline: end of the semester preceding the proposed study.

Semester course, one, two or three hours.

THEA 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in theatre. Junior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

THEA 384. PLAYWRITING. This course emphasizes the various aspects of writing an effective play. Topics include the processes of drafting and revision, analyses of literary style and technique, and methods of offering and accepting constructive criticism. Additionally, the collaborative nature of playwriting will be addressed; a play is not complete until the writer has involved others in the creative process. The student is expected to submit original manuscripts during the semester. Students may only receive credit for one of Theatre 384 or Writing 384.

Offered periodically, semester course, three hours.

THEA 390. STUDIES IN THEATRE. Subject matter varies each semester, to allow an in-depth study of aspects of theatre not covered in as much detail in other courses.

Semester course, three hours.

THEA 460. INDEPENDENT STUDY. An opportunity for students with extensive background in theatre to do intensive independent study or research on specialized topics. Senior standing with declared Theatre minor, permission of the department chair, and a faculty sponsor are required. Application deadline: end of the semester preceding the proposed study.

Semester course, one, two or three hours.

THEA 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in theatre. Senior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

THEA 480. INTERNSHIP IN THEATRE. Students pursuing a minor in Theatre may, with prior consent of the Department, earn academic credit for work done (normally off campus) under the direct supervision of a professional in a theatre-related field. Students must keep a daily log of activities and submit an academic paper summarizing the experience. A maximum of six credits of internship may apply toward graduation. *Semester course, one to six hours.*

WRITING (WRIT)

WRIT 101. FOUNDATIONS OF ACADEMIC DISCOURSE. A course introducing students to the fundamentals of college composition. Topics include the writing process, rhetorical strategies, basics of critical reading and thinking, and key forms of writing such as informative, evaluative, argumentative, and synthesis. This course serves as a foundation to prepare students to succeed in other academic writing contexts. This course contains the Information Literacy (IL) requirement.

Semester course, three hours.

WRIT 260. INDEPENDENT STUDY. Individual study of a specialized topic(s) in writing. Sophomore standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

WRIT 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in writing. Sophomore standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

WRIT 271. CREATIVE WRITING. An exploration of the elements and techniques of writing short fiction and poetry. Informal lectures and discussions focus on student writing.
Semester course, three hours.

WRIT 272. DEVELOPING CHARACTERS. A creative writing course that will allow students to develop character backstory and explore the impact of character psychology on action and in dialogue. Concepts will enhance character development for film scripts, short stories, novels, and more. Students may only receive credit for one of Communication Arts 272 or Writing 272.
Semester course, three hours.

WRIT 281. CREATIVE NON-FICTION. An exploration of the elements and techniques of writing creative nonfiction, including such forms as personal essays, memoirs, travel writing, biography, literary journalism, book reviews, and lyric essays. Informal lectures and discussions focus on student writing. *Semester course, three hours.*

WRIT 290. STUDIES IN WRITING. Subject matter varies each semester, to allow an in-depth study of writing concepts, issues, and practices not covered in as much detail in other courses.
Semester course, three hours.

WRIT 305. TECHNICAL COMMUNICATION. This course explores elements of clear and effective writing and oral expression appropriate for careers in the technical professions. Coursework will include case studies, job search materials, set of instructions, standard professional correspondence, examination of social media in professional settings, oral presentation with presentation software, and research into a technical field with the goal of communicating that field to non-experts. Prerequisite: Writing 101. *Semester course, three hours.*

WRIT 310. BUSINESS COMMUNICATION. This course explores elements of clear and effective writing and oral expression for business-related professions. Coursework includes business communication case studies, job search materials, business correspondence (e-mail, memos, and letters), business proposals, business plans, oral presentations, social media in the business world, and formal business reports. Prerequisite: Writing 101. *Semester course, three hours.*

WRIT 315. TECHNICAL AND PROFESSIONAL DOCUMENT DESIGN. This course explores principles, techniques, and procedures of electronic and print-based document production. Topics include the relationship between written and visual material; traditional copy preparation and design; desktop publishing; traditional printing techniques for books, brochures, pamphlets, and newsletters; and an introduction to electronic document design and production. Students will study key layout and design concepts and analyze examples. Student will produce their own documents, including newsletters, small and large advertisements, brochures, flyers, online journal or newspaper blog space, and a website entry page. Prerequisite: Writing 101. *Semester course, three hours.*

WRIT 320. PROFESSIONAL EDITING. This course provides an overview of key concepts and skills essential for the professional editor. It will cover standard proofreading marks, the creation and use of style guides, communication with authors and publishers, best practices in freelance editing, and feedback tools in Microsoft Word and Adobe Acrobat. Students will gain competency in editing both fiction and non-fiction prose as proofreaders, copyeditors, content editors, and developmental editors. Prerequisite: Writing 101. *Offered periodically, semester course, three hours.*

WRIT 359. SCREENWRITING. This course is an introductory course for screenwriters. Topics of study will include character development, plot structure, storytelling techniques in film, as well as the narrative structure. Students will study films and screenplays as they learn to recognize various elements mentioned previously in feature films. Additionally, students will learn to craft their own stories for the screen. Students may only receive credit for one of Communication Arts 359 or Writing 359. *Spring semester only, three hours.*

WRIT 360. INDEPENDENT STUDY. Individual study of a specialized topic(s) in writing. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

WRIT 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in writing. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

WRIT 382. POETRY WRITING. This course explores various forms and elements of lyric poetry and gives students the opportunity to develop their craftsmanship and poetic vision. In addition to producing their own poetry, students will analyze poems by published writers and fellow students, explore the literary marketplace, and read essays on poetics and on the role of the Christian artist. Prerequisite: Writing 101. *Offered periodically, semester course, three hours.*

WRIT 383. STORY WRITING. This course explores various forms and elements of the short story and gives students the opportunity to develop their craftsmanship and narrative vision. In addition to producing their own stories, students will analyze stories by published writers and fellow students and read essays on fiction writing and on the role of the Christian artist. Prerequisite: Writing 101.
Offered periodically, semester course, three hours.

WRIT 384. PLAYWRITING. This course emphasizes the various aspects of writing an effective play. Topics include the processes of drafting and revision, analyses of literary style and technique, and methods of offering and accepting constructive criticism. Additionally, the collaborative nature of playwriting will be addressed; a play is not complete until the writer has involved others in the creative process. The student is expected to submit original manuscripts during the semester. Students may only receive credit for one of Theatre 384 or Writing 384.
Offered periodically, semester course, three hours.

WRIT 390. STUDIES IN WRITING. Subject matter varies each semester, to allow an in-depth study of writing concepts, issues, and practices not covered in as much detail in other courses.
Semester course, three hours.

WRIT 460. INDEPENDENT STUDY. Individual study of a specialized topic(s) in writing. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

WRIT 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in writing. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

WRIT 480. INTERNSHIP IN WRITING. This course offers practical experience in the field of writing. Prerequisite: Sophomore status or higher and permission of the department internship coordinator. *Semester course, one to six hours.*

DEPARTMENT OF EXERCISE SCIENCE

Dr. Prins, Chair; Dr. Ault, Dr. Buxton, Dr. Gerhart, Mr. Gibson. Additional Instructional Faculty: Mr. Cook, Mr. Garvey, Mr. Patterson, Dr. Wise.

POLICIES GOVERNING THE EXERCISE SCIENCE PROGRAM

The Department of Exercise Science and Grove City College believe that a Christian liberal arts college should teach the "whole individual", giving careful attention to the development of psychomotor (physical development), cognitive (basic reasoning), and the affective (social, emotional and spiritual) behavioral goals of the student regardless of his/her major.

In an attempt to realize this philosophy, the Department of Exercise Science presents a balanced program that encompasses the many facets of exercise science. The specific objectives of the program are to develop a heightened awareness of personal fitness and wellness, to develop neuromuscular skills, to cultivate an interest in recreation, and to encourage desirable social and moral standards.

VISION

The Department of Exercise Science is committed to educating, serving, and developing student's and future leaders to advance the state of lifelong health, wellness and physical activity among members of both local and extended communities.

MISSION

Our mission is to provide student-centered instruction, conduct research, perform service, and promote health and well-being through discovery, learning, and participation in the study of Exercise Science in a Christian community.

Course Requirements for a Bachelor of Science Degree in Exercise Science—92-95 hours

Exercise Science Core (59 hours):

Exercise Science 101, 203, 230, 244, 253, 254, 256, 258, 304, 306, 307, 309, 310, 312, 313, 377, 404, 407, and 480.

Exercise Science Electives (15-17 hours):

Choose fifteen hours from Exercise Science 102, 134, 201, 205, 210, 215, 220, 221, 223, 235, 237, 240, 242, 245, 250, 251, 261, 305, 344, 402, 403; or choose to complete one of the following concentrations:

Athletic Training: Exercise Science 215, 237, 249, 251, 261, and three additional hours from the Exercise Science courses listed above.

Coaching: Exercise Science 201, 205, 251, 305, Management 312, and three additional hours from the Exercise Science courses listed above.

Personal Training: Exercise Science 220, 221, 240, 261, 402, and three additional hours from the Exercise Science courses listed above.

Physiological Sciences: Exercise Science 237, 242, 245, 344, and three additional hours from the Exercise Science courses listed above.

Pre-Occupational Therapy: Psychology 209, 211, Sociology 101, Exercise Science 215, 250, and one of Biology 102 or Psychology 312.

Pre-Physical Therapy: Biology 102, Chemistry 112 and 114, Physics 122, Exercise Science 250, and one of Psychology 209 or 211.

Strength & Conditioning: Exercise Science 221, 240, 261, 403, and three additional hours from the Exercise Science courses listed above.

Major-Related Requirements (18-19 hours):

Biology 101; Chemistry 111 and 113; Mathematics 111 or 161; Physics 121; and Psychology 201.

Courses that count in the Exercise Science major quality point average (MQPA):

All courses with "EXER" prefix. A minimum MQPA of 2.50 is required by the end of the sophomore year and maintained through graduation. Transfer students and students changing their major after freshman year will be evaluated after their second semester as an Exercise Science major. Students on academic probation will be evaluated after one semester and students below a 2.50 MQPA will be moved to the Undeclared (UNSE) major designation. Students with a MQPA below 2.50 will not be permitted to register for EXER 480.

The following courses provide instruction in locating, evaluating and presenting information related to the Exercise Science discipline: Exercise Science 377 Research Methods — Writing Intensive (WI) and Information Literacy (IL), and Exercise Science 307 Exercise Prescription— Speaking Intensive (SI)

Course Requirements for a Minor in Exercise Science (23 hours of required courses)

A minor in Exercise Science will consist of Exercise Science 101, 203, 221, 244 or 254, 253, 256, and 258. Biology 341 may be taken in the place of Exercise Science 253.

The Exercise Science minor curriculum has the potential to enrich the academic preparation of students pursuing majors in Biology, Chemistry, Education, and even Business Program majors with entrepreneurial aspirations in commercial or community-based health, fitness, or athletics. The curriculum also provides an opportunity for students in pursuit of health-related professions which require graduate studies, doctoral research and/or professional training.

Course Requirements for a minor in Nutrition (15 hours)

A minor in Nutrition will consist of Exercise Science 134, 240, 244, 254, and 344.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

EXERCISE SCIENCE (EXER)

EXER 101. INTRODUCTION TO EXERCISE SCIENCE. This course introduces students to the field of Exercise Science, requirements for professional certification, graduate school requirements, and career options in both health fitness and clinical fields. Lecture topics will include the mission and vision of the American College of Sports Medicine (ACSM), the Commission on Accreditation for Exercise Science, and the Department of Exercise Science. Students will become familiar with the ACSM JTAs (Job Task Analysis) which will be covered across the Exercise Science curriculum. Students will begin to create individual portfolios to show how the JTAs and department objectives are met across the curriculum. *Semester course, two hours.*

EXER 102. FAITH AND FITNESS. This course will integrate online lecture and discussion to investigate the relationship between faith, health, and fitness. As this relationship is unraveled, students will gain a greater understanding of what it means to be called, how faith can impact health, how fitness and health behaviors can impact faith, and how faith can be integrated into the health and fitness industry. *Summer online only, one hour.*

EXER 134. INTRODUCTION TO NUTRITION. An introduction to the importance of diet for present and future good health. Carbohydrates, fats, proteins, vitamins, and minerals, and their interactions will also be addressed. In addition, the course explores topics such as label-reading, popular diets, dietary analysis, and other issues of current interest in the field of nutrition, including sport and exercise nutrition, supplements, and life-cycle nutrition. *Spring semester only, three hours.*

EXER 201. ETHICS IN SPORTS. This course will explore the concepts of sport and competition in the context of a Christian world view. Special emphasis will be given to the theology of competition, a biblical foundation for spiritual integrity and ethical conduct, the mind and heart of the Christian athlete, and character and performance as a matter of Christian stewardship. Students will be encouraged in their spiritual maturity, promoting their athletic and intellectual development.
Fall semester only, one hour.

EXER 203. EXERCISE AND SPORT PSYCHOLOGY. This course provides an overview of psychological theory, research and methodology with an emphasis on application within diverse exercise settings. Topics include the history and development exercise psychology, personal and

environmental factors of physical activity, use of counseling skills for behavior modification, and group processes within physical activity and exercise. Prerequisite: Exercise Science 101.
Spring semester only, three hours.

EXER 205. INTRODUCTION TO SPORTS MINISTRY. This interdisciplinary course will explore the spreading of the gospel and what it means to be a Christian athlete through sport. Many opportunities for ministry are presented through sports as one of the most powerful of social institutions in the world. A grace-based view of the theology of sports and competition in lieu of a performance-based approach will be the cornerstone of this course. Sports ministry will be examined as a tool for transforming lives through sharing the Gospel, discipleship and mentoring.
Semester Course, three hours.

EXER 210. FITNESS SWIMMING. The purpose of this course is to expose the student to fitness swimming, water aerobics, workout development in swimming/water aerobics.
Offered periodically, two hours.

EXER 215. MEDICAL TERMINOLOGY. This is an online course that will help train students to understand and speak commonly used terms in various healthcare fields. Topics include word construction, body structure terminology, and terminology related to body systems and disorders.
Online only, three hours.

EXER 220. WELLNESS PROMOTION AND PROGRAMMING. This course examines strategies for successful health promotion and programming. Emphasis is placed on synthesis of various concepts related to wellness programming and guidelines for planning, implementing, and evaluating successful programs. There will be opportunities for planning, implementing, and evaluating programs for the Employee Wellness Program. Prerequisite: Exercise Science 101. *Spring semester only, two hours.*

EXER 221. PERSONAL TRAINING. This course will introduce students to the profession of personal training. Students will develop skills in exercise technique, including teaching approaches involving free-weight and machine exercises, cardiovascular activities, flexibility, and plyometrics. Program designs will include the healthy adult as well as for adults presenting unique challenges to exercise. Students will design and implement a program for an assigned client, whom they will train throughout the second half of the semester. Prerequisite: Exercise Science 101.
Alternate years, fall semester only, three hours.

EXER 223. RED CROSS LIFEGUARD TRAINING. The primary purpose of the American Red Cross Lifeguarding program is to provide entry-level lifeguard candidates with the skills and knowledge to prevent, recognize, and respond to emergencies and to provide care for injuries and sudden illnesses until advanced medical personnel arrive and take over. It is a certification course for American Red Cross Lifeguarding, CPR/PR, AED, and First Aid. An additional fee is charged for this course. Two and one-half hours/week. *Offered periodically, two hours.*

EXER 228. PHYSICAL EDUCATION FOR ELEMENTARY EDUCATORS. The purpose of this class is to introduce the students to a basic overview of elementary physical education in order that they become advocates of physical education and learn to integrate movement education within their classrooms. *Semester course, one hour.*

EXER 230. INTRODUCTION TO EXERCISE PROGRAM DESIGN. This course will instruct students in designing and implementing scientifically sound exercise programs. This includes dynamic and static warmup, resistance training, aerobic conditioning, speed and agility programming, and plyometrics. The process of needs analysis will be introduced and covered. The students will be introduced to basic periodization theories and program implementation and adjustment strategies. The course will also cover an introduction to exercise equipment types, functions, and uses. For exercise science students, this course will serve as an introduction to the pertinent skills and knowledge required of them in both their professional internship and future career. Prerequisites: Exercise Science 101.
Semester course, three hours.

EXER 235. FACILITY MANAGEMENT. This course will focus on the proper guidelines, standards and regulations necessary to successfully design and operate a safe and functional health and fitness facility. The minimal performance codes needed to operate legally will be examined, including compliance with the American Disabilities Act. The necessary steps to ensure optimum performance of a health and fitness facility, such as program development and marketing, will be discussed. This course will also cover important topics such as compliance with the American Disabilities Act, incorporating technical advances into the facility, hiring and training staff, emergency plans, risk management policies, and all federal laws and guidelines to ensure the safety of both the management and the users of a facility. Prerequisite: Exercise Science 101. *Offered periodically, two hours.*

EXER 237. SPECIAL TOPICS IN EXERCISE SCIENCE. The purpose of this course is to introduce students to the EBP process and develop literacy abilities while investigating hot topics relevant to sport and human performance. Topics covered will include the benefits of EBP and the EBP process, conducting a literature search, appraising literature for best evidence, various topics in sport and human performance (i.e. performance enhancing drugs, movement screening for injury prediction and prevention, concurrent strength and endurance training, weight loss strategies, etc.). Prerequisite: Exercise Science 256. *Summer online only, three hours.*

EXER 240. DIETARY SUPPLEMENTS. This course provides an overview of the dietary supplement industry, current regulations, product development process, and marketing of products. Students will learn how to critically evaluate dietary supplements in terms of claims, efficacy, and safety. This course, offered online, is open to all majors. Prerequisites: Exercise Science 101 or 134. *Alternate years, spring semester and summer online only, three hours.*

EXER 242. PREVENTION AND TREATMENT OF CHRONIC DISEASES. The purpose of this course is to provide the student with a comprehensive education on the nature of the most prevalent chronic diseases afflicting western society today. This course will examine the epidemiology, pathophysiology, prevention, and treatment of diabetes, cardiovascular disease, and obesity. Prerequisite: Biology 101 or sophomore status. *Winter and summer online only, three hours.*

EXER 244. NUTRITION AND HEALTH. A study of the science of nutrition with an emphasis on how nutrition influences health and wellbeing. Students will gain a foundational knowledge of the role of nutrition in the development and treatment of chronic diseases. Prerequisite: Exercise Science 101 or 134. *Fall semester only, three hours.*

EXER 245. EXERCISE NEUROBIOLOGY. This course will introduce current concepts and literature regarding the effects of exercise on neurotrophic factors and how the brain acutely and chronically adapts to exercise. *Summer and winter online, three hours.*

EXER 249. INTRODUCTION TO ATHLETIC TRAINING. The course introduces the role of the athletic trainer and concepts of sports medicine. Students will learn prevention, evaluation and treatment for athletic injuries. The course will provide an introduction to both the orthopedic assessment and management process as well as basics of biomechanics and ethical issues in the Athletic Training profession. Prerequisite: Sophomore Standing. *Fall semester, one hour.*

EXER 250. INTRODUCTION TO PHYSICAL AND OCCUPATIONAL THERAPY. This course will provide an introduction to the practices of physical and occupational therapy. It will integrate studies in biology and anatomy for application in future careers in physical or occupational therapy. Students will learn how to take basic medical histories, have an introduction to performing a general physical examination, and begin to develop differential diagnoses for various musculoskeletal processes. In addition, students will begin to investigate therapy modalities applicable to a variety of therapy needs. Throughout this course, students will gain knowledge helpful in their transition into the first year of an advanced health professional program. Prerequisite: Sophomore standing. *Spring semester only, one hour.*

EXER 251. PREVENTION AND CARE OF INJURIES. The purpose of this course is to give the students the knowledge and skills necessary to prevent and care for athletic related injuries. The topics

covered include fitness training, nutrition, sports equipment, emergency situations, blood borne pathogens, environmental conditions, taping techniques, injury rehabilitation, psychological concerns with injuries, recognition of injuries, and the basic anatomy of and common injuries to the different parts of the body. There is an additional fee required for this course. Prerequisite: Exercise Science 101. *Spring semester only, three hours.*

EXER 253. ANATOMY & PHYSIOLOGY I. This course will introduce the student to human anatomy and physiology with emphasis on the various body systems and how they integrate with one another. The effect of exercise on each system will be explored and clinical examples will be discussed. Laboratory exercises will include simulations using physical and computer models, as well as introductory tissue dissections. Two lectures and one lab per week. Prerequisite: Exercise Science 101 or Biology 341. *Fall semester only, four hours.*

EXER 254. NUTRITION IN SPORTS AND EXERCISE. Using USDA recommendations, this course will explore nutritional strategies for all levels of physical activity and competitive sports. Emphasis will be placed on energy balance, substrate metabolism, hydration, ergogenic aids, nutritional supplementation, and banned substances. Prerequisite: Exercise Science 101 or 134. *Fall semester and summer online only, three hours.*

EXER 256. PHYSIOLOGY OF EXERCISE. This course will survey the acute and chronic effects of exercise on human systems. Students will be introduced to the essentials of human movement, energy metabolism, cardiorespiratory function, and sport performance. Three lectures and one lab per week. Prerequisite: Exercise Science 253 or Biology 341. *Semester course, four hours.*

EXER 258. ANATOMY & PHYSIOLOGY II. A continuation of the study of human anatomy and physiology with emphasis on the various body systems and how they integrate with one another. The effect of exercise on each system will be explored and clinical examples will be discussed. Laboratory exercises will include simulations using physical and computer models, as well as introductory tissue dissections. Two lectures and one lab per week. Prerequisite: Exercise Science 253. Equivalent course: Biology 346 (Mammalian Physiology). *Spring semester only, four hours.*

EXER 260. INDEPENDENT STUDY. Individual study of specialized topics in exercise science. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 261. CORRECTIVE EXERCISE STRATEGIES. This course will use a combination of interactive lectures and hands-on workshop style teaching methods to teach students how to identify common postural and movement dysfunctions and the exercise strategies to address them. Prerequisites: Exercise Science 256 and 258. *Fall semester and summer online, three hours.*

EXER 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in exercise science. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 290. STUDIES IN EXERCISE SCIENCE. A course that covers special topics related to exercise science. *Semester course; one, two or three hours.*

EXER 304. EXERCISE TESTING. This course will cover fitness testing procedures for healthy and clinical populations. The course will follow the American College of Sports Medicine Guidelines for Exercise Testing. There will be a balance between lecture and laboratory work. Prerequisites: Exercise Science 256. *Semester course, three hours.*

EXER 305. BASIC PRINCIPLES OF COACHING. This course will introduce the principles of coaching team and individual sports. The student will be able to identify and demonstrate the personal and professional qualities required to become an effective coach at any level. The student will be able to develop a basic philosophy regarding the ethical and logical decision-making processes involved in coaching sports. *Semester course, two hours.*

EXER 306. EXERCISE LEADERSHIP. This course will focus on the practical skills necessary to teach group exercise classes. It will provide a survey of basic instructor skills such as music selection, choreography and cueing. All students will experience introductory class leadership in a variety of traditional and contemporary modes of group exercise including strength, flexibility, cardiovascular, and equipment-based classes. Prerequisite: Exercise Science 230. *Semester course, two hours.*

EXER 307. EXERCISE PRESCRIPTION. This course focuses on developing exercise prescriptions for healthy populations as well as those with chronic diseases. Prescriptions will be based on possible client goals of improved health, fitness or quality of life (abilities to perform activities of daily living). All course work will follow the standards set by the American College of Sports Medicine. This course meets the Speaking Intensive (SI) requirement for the Exercise Science major. Prerequisite: Exercise Science 256. *Fall semester only, three hours.*

EXER 309. BIOMECHANICS. The purpose of this course is to study biomechanical concepts and principles with special focus on their applications in human movement and physical activity. Students will examine the relationship between internal and external biomechanical factors and their effect on human performance and mechanisms of injury. Both qualitative and quantitative approaches will be discussed and applied to movement observation. Prerequisites: Physics 121; and Exercise Science 258 or Biology 346. *Fall semester course, three hours.*

EXER 310. FUNCTIONAL KINESIOLOGY. This course will provide a greater understanding of how humans move from an integrative functional anatomy and applied biomechanical lens. Specifically, muscle groups and their functional relationships will be presented with application to simple mechanical principles. Course emphasis will be placed on anatomical and mechanical analysis of motion as it pertains to human movement in sports and exercise. Prerequisites: Exercise Science 256 and 258. *Spring semester only, three hours.*

EXER 312. DIET, EXERCISE, AND CHRONIC DISEASE. This course will focus on prevalent chronic diseases including obesity, diabetes, hypertension, cardiovascular disease, dyslipidemia; the pathophysiology and etiology of these conditions; and the role of lifestyle factors such as diet and exercise in disease prevention and treatment. Prerequisite: Exercise Science 244 and 256.
Spring semester only, three hours.

EXER 313. ADVANCED EXERCISE PHYSIOLOGY. This course will focus on the integrative physiology and physiological responses to exercise. Specifically, this course will cover energetics, metabolism, and endocrine physiology, as well as discuss cardiovascular hemodynamics in various environments and respiratory exercise physiology. Prerequisites: Exercise Science 256 and 258.
Spring semester only, three hours.

EXER 344. LIFE CYCLE NUTRITION. A survey of nutrition needs throughout the stages of the life cycle, including pregnancy and lactation, infancy, adolescence, adult, and aging. The socioeconomic, cultural, and psychological influences on food and nutrition behavior will also be addressed. Prerequisite: Exercise Science 101 or 134 or Biology 101.
Spring semester and summer online, three hours.

EXER 360. INDEPENDENT STUDY. Individual study of specialized topics in exercise science. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

EXER 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in exercise science. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 377. RESEARCH METHODS IN EXERCISE SCIENCE. This course will introduce basic methods of reading, understanding, evaluating, and applying research. Students will experience quantitative research, qualitative research, mixed-model research and research reviews. Students will also become acquainted with statistical concepts in research planning and design. Working in research

teams, students will complete a service-learning project for the Early Education Center (EEC). They will also write a research proposal to be continued and completed in EXER 407. This course meets the Writing Intensive (WI) and Information Literacy (IL) requirements for the Exercise Science major. Prerequisites: Exercise Science 256; Psychology 201; and Exercise Science 230 or 307.
Fall semester only, three hours.

EXER 402. CERTIFIED EXERCISE PHYSIOLOGIST. This course will integrate the EXER curriculum, specifically the objectives of the ACSM certified Exercise Physiologist (EP-C). The job task analyses (JTAs) specific to the EP-C exam will be covered in detail. Students will apply the EP-C JTAs in class and with personal training clients. Prerequisites: Exercise Science 304 and 307.
Spring semester only, three hours.

EXER 403. PRINCIPLES OF STRENGTH AND CONDITIONING. This course will serve as preparation for students who will be taking the Certified Strength and Conditioning Specialist (CSCS) certification exam given by the National Strength and Conditioning Association. Prerequisite: Exercise Science 304 and 307. *Fall semester only, three hours.*

EXER 404. PROFESSIONAL CERTIFICATION AND SEMINAR. This course provides instructor-guided preparation for a professional certification exam offered by ACSM or NSCA. There is an additional cost incurred by the student to register for the certification exam and purchase the study materials, including practice exams, from the certifying organization. Students will determine which certification exam best matches their future career and complete it prior to the end of the semester, on or before Study Day. In addition, students will be required to complete a professional portfolio that will represent the body of work completed in the Exercise Science major. Prerequisite: Exercise Science 480. *Fall semester only, one hour.*

EXER 407. RESEARCH PRACTICUM. The students will complete the original group research project created in EXER 377, including data collection, statistical analysis, and a final report. Students will complete an individual research proposal. Prerequisites: Exercise Science 304 and 377.
Spring semester only, three hours.

EXER 460. INDEPENDENT STUDY. Individual study of specialized topics in exercise science. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

EXER 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in exercise science. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

EXER 480. INTERNSHIP. Students will earn academic credit for field experience in the areas of applied Exercise Science, such as coaching, athletic training, strength and conditioning, health and fitness, physical therapy, and nutrition. Students will first determine their career path and corresponding professional certification. Then students will locate a facility along with an onsite supervisor for their internship. Professional dress is expected each day of the internship. Grade is dependent upon written evaluation by an on-site supervisor and the submission of the student's written report to the Department of Physical Education. Students majoring in Exercise Science must earn at least five credits (300 clock hours) for this course. Prerequisites: Exercise Science 304, 306, and 307.
Semester course, one to six hours.

PHYSICAL EDUCATION (PHYE)

The Physical Education program at GCC is designed to provide students with foundational knowledge and physical activity opportunities to begin shaping their own health and wellness habits. Physical Education 100 Healthful Living is a required course that all freshman will take in their first year at Grove City College. It is an 8-week course offered online during the fall and spring semesters. Current evidence and best practices will be presented by Grove City College's Exercise Science faculty and the Counseling Center's

staff. All other Physical Education courses are offered as general electives and focus on the development of lifelong skills which will hopefully lead to a lifetime of healthy physical activity.

Upon completion of PHYE 100, a student may choose up to six additional hours of physical education courses with the "PHYE" prefix, but not more than one course per semester. Duplication of courses for credit is prohibited and the Department of Exercise Science reserves the right to cancel any course based on insufficient enrollment.

PHYE 100. HEALTHFUL LIVING. This course introduces students to fundamental concepts associated with healthful living throughout the lifespan in modern society. The course will focus upon the promotion of health and wellness within individuals, families, and communities through an understanding of healthful living, development of healthy lifestyles, and avoiding or overcoming harmful habits. Current research and best practices will be presented to further students' knowledge and help them to shape their own strategies for a healthy and fit future.
Semester course, online only, one hour.

PHYE 190. STUDIES IN PHYCIAL EDUCATION. A course that covers special topics related to athletics and physical education. *Semester course; one, two or three hours.*

PHYE 201. RACQUETBALL. The purpose of this course is to teach the fundamental skills and knowledge of the sport of racquetball. It will consist of lecture, practice of specific skills, and competition. Students will develop an appreciation of racquet ball as a means to a healthy use of leisure time. Two hours per week. *Spring semester only, one hour.*

PHYE 207. BEGINNING BOWLING. This course will introduce students to the basic sport of bowling. Students will learn the nature and purpose of the game; lane, pin, and ball specifications; rules; basic skills; and tactical strategies of the game. Two hours per week. *Semester course, one hour.*

PHYE 209. TENNIS. This course introduces students to the concept of tennis and its nature and purpose. Tennis can be the most demanding sport, or it can be played purely as a social diversion. It can be played by almost anyone at almost any skill level and the rules are the same the world over. Students will develop an appreciation for tennis as a valuable method of exercise that can be continued throughout one's lifetime, increasing the development of cardio-respiratory and muscular endurance. Two hours per week. *Semester course, one hour.*

PHYE 210. BALLROOM DANCING. This course explores the history, rhythm, steps and styles of the Foxtrot, Waltz, Tango, Cha-Cha, Rumba and Swing. Students will learn the basic skills and information necessary to develop and continue one's interest in ballroom dancing, in addition to learning the fundamentals of lead/follow technique, dance etiquette, cooperation with a partner, and the ability to identify and distinguish music for each dance. *Fall semester only, one hour.*

PHYE 211. BEGINNING DANCE. This course explores various movement disciplines including elements of Ballet, Jazz, Modern Dance, Folk Dance, Musical Theater, Lyrical and Hip Hop while investigating the history and cultural value of dance. No prior dance experience is necessary.
Fall semester only, one hour.

PHYE 213. **INTERMEDIATE DANCE.** This course explores various movement disciplines including elements of Ballet, Jazz, Modern Dance, Musical Theater, Lyrical and Hip Hop while investigating the history and cultural value of dance. This course is more appropriate for the student with previous dance experience. *Fall semester only, one hour.*

PHYE 215. ADVANCED DANCE. This advanced course explores various movement disciplines including elements of Jazz, Modern, Contemporary, Musical Theater, Lyrical and Choreography while investigating the history and cultural value of dance. This course is more appropriate for the student with previous dance experience. Prerequisite: Physical Education 213. *Spring semester only, one hour.*

PHYE 216. ADVANCED BALLROOM DANCING. This advanced level course continues the exploration of the rhythm, steps and styles of the Foxtrot, Waltz, Tango, Cha-Cha, Rumba and Swing. Students will learn more advanced patterns and skills in these dances, in addition to learning the Viennese Waltz and advanced partnering in the Swing. Prerequisite: Physical Education 210.
Spring semester only, one hour.

PHYE 217. VOLLEYBALL. This course teaches students the specific skills and knowledge of the sport of volleyball. Class will consist of lecture, practice of fundamental skills necessary for success and competition. Students will develop an appreciation for volleyball as a means to use leisure time in a healthy manner as they demonstrate an understanding of the fundamental skills, rules, and strategies necessary to participate in the sport of volleyball. Two hours per week.
Spring semester only, one hour.

PHYE 260. INDEPENDENT STUDY. Individual study of specialized topics in Physical Education. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

PHYE 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in physical education. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHYE 290. STUDIES IN PHYSICAL EDUCATION. A course that covers special topics related to athletics and physical education. *Semester course; one, two or three hours.*

DEPARTMENT OF HISTORY

Dr. Graham, Chair; Dr. Baker, Dr. Edwards, Dr. Harp, Dr. Mitchell. Additional Instructional Faculty: Dr. Smith.

Course Requirements for Bachelor of Arts Degree in History—42 hours

History Core Requirements (33 hours):

History 103, 143, 144, 201, 283, 285, and 400.
One course from: History 334, 336, 349, 350, 357, or 379.
One course from: History 224, 230, or 231.
Two courses from: History 206 or 207 (choose one), 208, 209, or 212.

History Electives (9 hours):

Three courses from: History 300- or 400-level courses, Political Science 317, Political Science 318, or Religion 341.

Courses that count in the History major quality point average (MQPA):

All courses with "HIST" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Arts Degree in History and Social Studies Secondary Education Certification—88 hours

History Core Requirements (30 hours):

History 103, 141, 143, 144, 201, 209, 212, 283, 285, and 357.

Major-Related Requirements (18 hours):

Economics 101, 102; Political Science 201, 204; and Sociology 103 and 201.

Education Requirements (40 hours):

Education 202*, 203, 204, 215, 316, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

History majors are strongly encouraged to take courses in languages, the humanities and the social sciences in their programs if they plan to attend graduate school in history. Courses at the 200 and 300 levels are open to all students.

The History Department seeks to equip their students with skills in professional writing, speaking and information literacy. History 143 is designated as Information Literacy (IL) course, and History 201 and 400 are designated as Writing Intensive (WI) and Speaking Intensive (SI), and IL courses. Information literacy instruction includes defining and framing significant historical research questions; distinguishing different types of sources; using databases to find relevant sources; critically evaluating www sites; citing sources correctly, respecting intellectual property and avoiding plagiarism; and synthesizing material from a range of electronic and traditional sources and presenting it in a cogent manner.

Course Requirements for a minor in Classical Studies (21 hours)

A minor in Classical Studies will consist of History 207 or 290 (Rome); English 302; Political Science 355 or Philosophy 231; and twelve additional hours from History 204, 206, 207 or 290 (Rome), 341, 346, 376, 410; Religion 211, 212; Political Science 355 or Philosophy 231; Greek 101, 102, 201, 202, 260, 360, 460; Latin 101, 102, 201, 202, 290; Art 201; Communication Arts 427; Music 331; and Sociology 103.

Course Requirements for a minor in Classical Christian Education (23 hours)

A minor in Classical Christian Education will consist of History 204, 208, 410, 480 (2 cr); and twelve additional hours from History 206, 207, 290 (Rome), 341, 346, 376; Religion 211, 212; Political Science 355; Philosophy 231; Greek 101, 102, 201, 202, 260, 360, 460; Latin 101, 102, 201, 202, 290; Art 201; Communication Arts 427; Music 331; and Sociology 103.

Course Requirements for a minor in History (18 hours)

A minor in History will consist of six hours from each of the three following areas:

American History: History 283, 285, 334, 336, 349, 350, 357, or 379.

European History: History 208, 209, 212, 261, 262, 265, or 372.

Other History Electives: History 143, 144, 206, 207, 224, 231, 260, 270, 337, 338, 341, 343, 346, 360, 370, 375, 376, 378, 390, 400, 460, 470, 480, 488; History 317, 318 or Political Science 317, 318; or Religion 341.

Course Requirements for a minor in Medieval Studies (21 hours)

A minor in Medieval Studies will consist of English 304, History 208, Philosophy 232, and twelve hours from Art 201, English 224, 390 (Bible Study Before the Reformation), French 320, History 261, 341, 346, Latin 290 (Reading Latin), Music 331, Religion 341, 390 (Bible Study Before the Reformation, and Spanish 330.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

HISTORY (HIST)

HIST 103. FRESHMAN SEMINAR. This course is designed to take beginning history majors methodically through the process and techniques of historical research, from the crafting of a question through written and oral presentations of one's work. Students will also be introduced to the philosophical dimensions of the discipline including ways in which the historian may contribute to the common good. Topics of study vary depending on the instructor. *Spring semester, three hours.*

HIST 120. FOUNDATIONS OF HISTORY. An introduction to the principal theories, ideas, concepts, methods, and debates that have shaped the discipline of history. The course examines competing perspectives on history, human nature, and providence. It analyzes how historians use and evaluate evidence and provides Christian perspectives on history. *Semester course, three hours.*

HIST 141. WORLD GEOGRAPHY. An exploration of the physical and human geography of the globe. Students will study the mutual interaction of demographic, economic, political, social, and geographic factors in human history. *Fall semester only, three hours.*

HIST 143. WORLD HISTORY I. A survey of the basic history of world societies from the earliest recorded development of human civilizations to the late medieval period. As an Information Literacy (IL) course, it emphasizes designing historical research questions; finding, evaluating, and using primary and secondary sources; citing sources properly; and writing a cogent paper.
Fall semester only, three hours.

HIST 144. WORLD HISTORY II. A survey of the history of world societies from the early modern period to the present. Special emphasis is given to the interrelationship between the Western world and the non-Western world. *Spring semester only, three hours.*

HIST 201. HISTORIOGRAPHY. An introduction to the art and craft of history. Students learn the basics of the discipline of history, focusing on what historians do and have done, the essential concepts and methodologies they use, and the vocabularies they employ. Students sharpen the skills essential for work as a historian: critical reading, effective analysis, excellent writing, and skillful communication. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for History and SESS majors. *Semester course, three hours.*

HIST 204. HISTORICAL AND PHILOSOPHICAL FOUNDATIONS OF EDUCATION. A survey of the historical and philosophical foundations of education from antiquity to the present day. It includes an analysis of political, sociological, and financial issues related to American education with emphasis upon understanding the contributions of Western Civilization and the impact of American institutions on systems of education. *Semester course, three hours.*

HIST 206. ANCIENT EMPIRES I: NEAR EAST AND GREECE. A survey of ancient Near Eastern, Aegean and Hellenistic worlds with emphasis on the formation of and resistance to empires. The course explores the varied cultural legacies of these ancient cultures and civilizations.
Alternate years, fall semester only, three hours.

HIST 207. ANCIENT EMPIRES II: ROME. This course provides an overview of the history of Rome, beginning with its western Mediterranean setting and tracing its development as a Republic and then its formation as an ancient empire stretching from Britain to the Tigris, and from the Danube to the Sahara. The course analyzes in some detail the dynamics of Roman imperialism as well as the varied responses of diverse groups which found themselves under Rome's sway.
Alternate years, spring semester only, three hours.

HIST 208. MEDIEVAL EUROPE. A survey of Europe from the end of the Roman Empire to the early fifteenth century that emphasizes the cultural and intellectual legacy of the Middle Ages.
Alternate years, spring semester only, three hours.

HIST 209. RENAISSANCE AND EARLY MODERN EUROPE. An examination of the Renaissance, the formation of nation states in the fifteenth century, the Reformation of the sixteenth century, and the political, social, and intellectual origins of modern Europe before the French Revolution. *Fall semester only, three hours.*

HIST 212. MODERN EUROPE. An examination of European states and the nature of European identity from 1789 to the present, focusing on political, economic, and social revolutions; the impact of the global wars of the twentieth century; and the tensions surrounding European integration from 1945 onward. *Semester course, three hours.*

HIST 224. MODERN AFRICAN HISTORY. A survey of the peoples, events, and ideas/ideologies that have shaped the history of Africa from 1800 to the present. Special emphasis is given to the relationship between European imperialism and the current problems plaguing modern Africa. *Alternate years, fall semester only, three hours.*

HIST 230. MODERN SOUTH ASIAN HISTORY. This course introduces the major themes, ideas, and events of Modern South Asian history. While each of the modern constituent nations (India, Pakistan, Nepal, Bangladesh, Bhutan, Nepal, and Sri Lanka) will be discussed in comparison to one another, this course will focus on the regions known today as India, Pakistan, and Bangladesh. We will examine social change, intellectual movements, and the political currents of South Asia from the seventeenth century to the present. This class will also include introductions to the cultures of South Asia through food, major holidays, major religions, and contemporary politics. At the end of this class, students will be able to narrate the major events of Modern South Asian history, understand better its cultural and physical geography, and recognize the ways South Asia's past shapes its contemporary roles in the world. *Spring semester only, three hours.*

HIST 231. MODERN LATIN AMERICAN HISTORY. The story of Latin America from the beginning of the colonial period to the present. The class explores the geography and history of those countries colonized by Spain and Portugal in the sixteenth century, which still preserve the influence of Iberian political and social principles today. It also examines the subsequent political, social, and economic development of Latin America, the complicated relationships between individual countries in this region, and the increasing relationships between the region as a whole and the rest of the world. *Alternate years, fall semester only, three hours.*

HIST 253. UNITED STATES HISTORY SURVEY. An introductory survey of American history from its colonial origins to the present. This course will examine significant political, social, geographic, economic, religious, and cultural developments. Prerequisite: Middle Level Education majors only. *Fall semester only, three hours.*

HIST 260. INDEPENDENT STUDY. Individual study of specialized topics in history. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

HIST 261. BRITISH HISTORY TO 1781. A survey of British history with special emphasis on the development of the common law, parliament, and the British constitution. Recommended for pre-law students. *Alternate years, semester course, three hours.*

HIST 262. BRITISH HISTORY SINCE 1781. A survey of British history with special emphasis on Britain as an imperial power and on political, social, and cultural developments at home. *Alternate years, semester course, three hours.*

HIST 265. HISTORY OF SPAIN, 1500 TO PRESENT. An introduction to Spanish history from the union of the Crowns of Castile and Aragon to the present day. The central theme of the course is the problem of identity—how have the Iberian peoples identified themselves over time—and the political, religious, economic, and social difficulties historically associated with identity. *Alternate years, fall semester only, three hours.*

HIST 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in history. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

HIST 283. HISTORY OF THE UNITED STATES TO 1865. An introductory survey of American history from its colonial origins until the end of the Civil War. The course examines political, social, economic, religious, and cultural developments. *Fall semester only, three hours.*

HIST 285. HISTORY OF THE UNITED STATES SINCE 1865. An introductory survey of American history from Reconstruction to the present. The course examines political, social, economic, religious, and cultural developments. *Spring semester only, three hours.*

HIST 317. CONSTITUTIONAL LAW OF THE UNITED STATES I. A study of the development of the United States Constitution through use of the case study method. This course especially focuses on the constitutional powers of the three branches of government, the relationship between state and federal governmental powers, and property rights and economic liberties. Students may not receive credit for both History 317 and Political Science 317. *Fall semester only, three hours.*

HIST 318. CONSTITUTIONAL LAW OF THE UNITED STATES II. A study of the development of the United States Constitution through the use of the case study method. This course especially focuses on the idea of equality and the equal protection clause, due process, privacy and liberty rights, freedom of speech, press and religion and other Bill of Rights issues. Students may not receive credit for both History 318 and Political Science 318. *Spring semester only, three hours.*

HIST 334. AMERICAN CIVIL WAR. An exploration of arguably the pivotal event in American history, this course will examine the origins, events, ramifications, and presentations of the war. Students will study its decisive moments, seminal leaders, and formative ideas as well as examining historiographical and popular treatments of the war. Students will delve into both primary and secondary historical sources, including biography and fiction, in order to understand the events, portrayals, analyses, and impact of the Civil War. *Alternate years, fall semester only, three hours.*

HIST 336. UNITED STATES MILITARY HISTORY. A study of the socio-political, economic, technological and human aspects of war that traces the development of "the American art of war" from the early colonial period to the present. *Alternate years, spring semester only, three hours.*

HIST 337. GLOBAL MILITARY HISTORY I. A thematic overview of military history in a global perspective from the Paleolithic era to 1870. This course focuses upon the tactics and strategies of armies and powers of the past, as well as traces how warfare reflects the social, cultural, economic, and political circumstances of the peoples who wage it. *Fall semester only, three hours.*

HIST 338. GLOBAL MILITARY HISTORY II. A thematic overview of military history in a global perspective from 1870 to the present. This course will trace the development of warfare during this period, from strategy and tactics to weaponry, while also examining whether the concept of "modern warfare" exists. In addition, the course will trace the relationship between society and the military and how warfare reflects the societies that wage it. *Spring semester only, three hours.*

HIST 341. THE RISE OF CHRISTIANITY. This course analyzes Christianity as it grew from an obscure movement into a dynamic force which swamped the pagan cults of the Roman Empire. Major topics include Roman paganism, Roman religious policy, the growth and persecution of Christianity, tensions between Christianity and classical culture, and the development of early medieval Europe and Byzantium. *Alternate years, semester course, three hours.*

HIST 346. BYZANTIUM AND ISLAM. A thematic overview of the pre-modern Byzantine and Islamic worlds, from their common roots in the Mediterranean world of Late Antiquity to the establishment of the Islamic Empires and Kingdoms of the Near East, Asia, and Africa. The course traces the transformation, flourishing, and decline of Byzantium concurrently with the rise of Islam to world dominance. *Alternate years, spring semester only, three hours.*

HIST 349. AMERICAN RELIGIOUS HISTORY. An exploration of religion in America that focuses on the various individuals and religious groups, events, ideas, and organizations that have had the most significant impact on American life. *Alternate years, spring semester only, three hours.*

HIST 350. SPORTS IN AMERICAN HISTORY. An overview of sports in America from colonial times until the present that focuses especially on the relationship between sports and society and issues of race, class, and gender. *Alternate years, spring semester only, three hours.*

HIST 357. MINORITIES IN AMERICAN HISTORY. An examination of the experience of minority groups in America focusing on Native Americans, immigrants, women, African Americans, and Asian Americans. The course analyzes the problems these groups experienced and their contributions to America. *Spring semester only, three hours.*

HIST 360. INDEPENDENT STUDY. An advanced course for students with substantial background in college history courses. Intensive and independent research into a particular historical question. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

HIST 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in history. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

HIST 372. THE FRENCH REVOLUTION AND NAPOLEON. An investigation of the French Revolution and Napoleonic France. Organized in a seminar format, this course analyzes the causes, major players, events, and consequences of the French Revolution. It explores the significant ideas that influenced or arose out of the French Revolution and the effect these ideas have on our current understanding of politics, society, and human nature. It assesses the pivotal role Napoleon Bonaparte played in the French Revolution and the debate over whether he represents the fruition of, or the antithesis to, the Revolution. Finally, the course examines the concept of revolution, evaluating the description or definitions of revolutions, and similarities between the French and other modern or pre-modern revolution. *Spring semester only, three hours.*

HIST 375. WORLD WARS I AND II. An exploration of the global impact of the two pivotal events of the twentieth-century world, examining the origins, events and ramifications of World Wars I and II. *Alternate years, spring semester only, three hours.*

HIST 376. ALEXANDER THE GREAT AND THE HELLENISTIC WORLD. An exploration of the life of Alexander the Great and the Hellenistic world created by his conquests. The course analyzes how the traditions of the Greeks were synthesized with the heritage of western Asia and northeast Africa to shape a world stretching from the Balkans to India.
Alternate years, fall semester only, three hours.

HIST 378. FOOD AND FEASTING IN THE WESTERN TRADITION. An examination of the mystery and wonder of man as the only animal who eats instead of feeds. The course will analyze the dining patterns and habits of the Hebrews, Greeks, Romans, and early Christians. Through the developments in dining brought about by the Industrial Revolution and the global economy, students will learn that mealtimes are more than a mere intersection of meat and drink. On a deeper level, our meals represent the intersection of theology, philosophy, history, and poetry. This amazing interplay reaches its epic fulfillment in the Feast – a special time at which family, congregations, and local communities gather round to celebrate the Abundance and the Divine.
Spring semester only, three hours.

HIST 379. AMERICAN INTELLECTUAL HISTORY. A study of American thought from the colonial era to the mid twentieth century. This course examines a variety of significant texts and key thinkers, seeking to understand them within their particular historical and cultural contexts.
Alternate years, spring semester only, three hours.

HIST 390. STUDIES IN HISTORY. Specialized subject matter that varies each semester depending upon interests of the instructor and students. *Semester course, three hours.*

HIST 400. SENIOR RESEARCH SEMINAR. A seminar designed to take seniors methodically through the process of writing a substantial research paper in history. It includes selecting a topic, conducting research (mostly in primary sources), constructing a detailed outline, writing, and presenting a paper. This course fulfills the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) requirements for History majors. *Semester course, three hours.*

HIST 410. **SEMINAR IN CLASSICAL & CHRISTIAN EDUCATION**. An intensive exploration of how the Christian faith illuminates academic study. This course will examine how faith and learning interacted in the West historically as well as how to apply the Christian faith to the operation of educational institutions and disciplines in the future. Throughout the course, special emphasis will be placed on contemporary Classical-Christian school movement as a case study of one way Christians are currently attempting to bring historical lessons and their faith to bear on education.

Alternate years, spring semester only, three hours.

HIST 460. INDEPENDENT STUDY. An advanced course for students with substantial background in college history courses. Intensive and independent research into a particular historical question. Senior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

HIST 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in history. Senior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

HIST 480. INTERNSHIP IN HISTORY. A semester of intensive study and work, usually off-campus, undertaken by the student with the approval of the faculty of the Department of History. A student must have a minimum QPA of 3.0 and may not have completed an internship in any other department, although exceptions may be made for a GCCI internship. Students are required to keep a journal of weekly activities and complete a project agreed upon with the Department. An internship in history may be taken at any institution that practices Public History. *Semester course, one to six hours*
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HIST 488. SEMINAR IN HISTORY. An advanced course for junior and senior students desiring an in-depth exploration of one historical problem, involving individual research, discussion, oral reports, and written essays. Prerequisite: Permission of the department.

Semester course, one, two or three hours.

HIST 499. HONORS IN HISTORY. Seniors who have shown special aptitude in history may, upon invitation and permission of the department, undertake special research in history. A 30-page historical paper and a defense of the paper before the history faculty are required. *Semester course, three hours.*

DEPARTMENT OF MATHEMATICS

Dr. Jackson, Chair; Dr. Bancroft, Dr. Bonomo, Dr. Drai, Dr. Flanders, Dr. McIntyre, Dr. E. Smith, Dr. Thompson.

Course Requirements for Bachelor of Science Degree in Mathematics—42-47 hours

Math Core Requirements (23 or 24 hours):

Mathematics 162, 210 or 213, 222, 261, 421, 465, and 488.

Math Electives (12 hours):

Choose three courses from Mathematics 303, 331, 332, 365, 422, 466, or 467. At least one course must be Mathematics 332, 422, 466, or 467.

Choose one additional course from Mathematics 232, 262, 303, 331, 332, 365, 422, 466, and 467.

Major-Related Requirements (7 or 11 hours):

Computer Science 141; Physics 101, or Physics 121 and 122.

Courses that count in the Mathematics major quality point average (MQPA):

All courses with "MATH" prefix, with the exception of Mathematics 110, 111, 118, 119, 141, 151, 152, 201, 237, and 240. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Science Degree in Mathematics and Secondary Education Certification—85-90 hours

This program fulfills the requirements of the full mathematics major and the requirements of the Commonwealth of Pennsylvania for secondary mathematics certification.

Math Core Requirements (32 or 33 hours):

Mathematics 162, 210 or 213, 222, 240, 261, 303, 331, 421, 465, and 488.

Math Electives (6 hours):

Choose two courses from Mathematics 232, 262, 332, 365, 422, 466, and 467 one of which must be chosen from Mathematics 332, 422, 466, or 467.

Major-Related Requirements (7 or 11 hours):

Computer Science 141; Physics 101, or Physics 121 and 122.

Education requirements (40 hours):

Education 202*, 203, 204, 215, 317, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Mathematics and Secondary Education Certification major quality point average (MQPA):

All courses with "MATH" prefix, with the exception of Mathematics 110, 111, 118, 119, 141, 151, 152, 201, 237, and 240. Mathematics Secondary Education Certification majors must have a minimum MQPA of 2.75 in all Mathematics courses excluding Mathematics 110, 111, 118, 119, 141, 151, 152, 201, and 237.

Every graduating mathematics major will receive a thorough introduction to mathematical ideas as well as to problem solving skills and strategies. Moreover, every graduate should be able to communicate technical ideas, both orally and through the use of a written document, and should also have an established ability to learn how to use a computer algebra system in particular and other library and electronic resources in general in order to generate, locate, evaluate, and use information. To this end, mathematics majors receive instruction in the use of *Mathematica* in the calculus sequence (Mathematics 161, 162, and 261) and also acquire a working knowledge of a computer program in Computer Science 141. They also gain experience in researching and presenting results, both orally and through writing a substantial technical paper, in Mathematics 488 *Seminar of Mathematics*. This collection of courses serves to satisfy the Writing Intensive, Speaking Intensive, and Information Literacy requirements within the major.

Course requirements for a concentration in Actuarial Science (55 hours)

Students majoring in Mathematics can also earn a concentration in Actuarial Science by completing Mathematics 306, 331, 332, and two of Mathematics 232, 262, 303, 365, 422, 466, or 467 with one course being at the 300-400 level for their math electives; Accounting 201; Finance 301; Finance 332 or 334; and Management 433. Students must also write a paper on probability or statistics in Mathematics 488. Students are also encouraged to take additional courses from Economics 101, 102, 302, and 442. The Mathematics 306 requirement is waived for students who pass the first actuarial exam on their own.

Course Requirements for a minor in Mathematics (22-23 hours)

A minor in Mathematics will consist of 22 hours, including Mathematics 210 or 213, and 222 but excluding Mathematics 110, 111, 118, 119, 151, 152, 201, 237, 240, 305, 306, and 307.

Students interested in graduate school in mathematics are specifically advised to take Mathematics 365, 422, 466, and 467.

Students who are enrolled in College Algebra, Pre-Calculus, or one of the calculus courses and determine that they are not properly placed may change to another course within the pre-calculus/calculus sequence on or before the sixteenth class meeting (twelfth class meeting if currently in College Algebra or Pre-Calculus). The student must have the approval of the current instructor and the instructor of the course to which the student intends to move. The student must complete and return an Add/Drop Form to the Registrar's Office. Note: A student may repeat a course in which he/she previously earned a grade of 'C-' or lower. A student who passes a course with a 'C' grade or higher may not later repeat the same class for credit or audit unless the course is designated as repeatable for multiple credits.

College Math Courses Taken in High School

Transfer credit may be awarded for mathematics courses that are equivalent or comparable to those offered by the Grove City College Department of Mathematics and completed with a grade of "C" or better. Any such courses taken before entering Grove City College must be listed in the catalog of the college of transfer as courses offered for degree credit to that college's undergraduates, must be taken in a classroom setting where most of the students are college undergraduates, and must be organized and taught by college faculty.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

MATHEMATICS (MATH)

MATH 110. COLLEGE ALGEBRA. Designed to help prepare students for success specifically in Business Calculus as well as in Pre-Calculus, this course offers a thorough treatment of linear and quadratic equations and inequalities, rational and radical equations, and functions and their graphs. A basic understanding of high school algebra is presumed. **This course does not satisfy the Quantitative/Logical Reasoning requirement**. *Semester course, three hours.*

MATH 111. PRE-CALCULUS. Designed to help prepare students for success in Physics 121 or Calculus I, this course offers a thorough treatment of function theory, analytic geometry, exponential and logarithmic functions, and trigonometry. A basic understanding of high school algebra and analytic geometry is presumed. *Semester course, three hours.*

MATH 118. FINITE MATHEMATICS. An introduction to a variety of topics from finite mathematics such as sets, counting, basic probability and statistics, linear systems, matrix algebra, and linear programming (graphical solutions). Time permitting, additional topics such as linear programming with the simplex method, Markov chains, and game theory will be considered. *Fall semester only, three hours.*

MATH 119. TOPICS IN CONTEMPORARY MATHEMATICS. This course will consist of a survey of a number of mathematical ideas on an introductory level. Topics may include graph theory, symmetry, sequences, fractals, fair-division algorithms, apportionment, financial math, and voting theory. *Spring semester only, three hours.*

MATH 141. BUSINESS CALCULUS. The differential and integral calculus of elementary functions with applications in business and economics. Students may not receive credit for both Mathematics 141 and 161. Mathematics 161, not 141, is the prerequisite for 162. *Semester course, four hours.*

MATH 151. SURVEY OF MATHEMATICS I. This course (along with Math 152) is a conceptual exploration of mathematical topics related to elementary and middle school mathematics, and is part of a two-course, six-hour mathematics requirement specifically designed for elementary education and early childhood majors. Content studied includes critical thinking and problem solving, logic, sets, relations and functions, numeration systems and whole-number computation, integers, and elementary number theory. Restricted to Elementary, Special Education with Elementary, Middle Level, and Music Education majors only. *Fall semester only, three hours.*

MATH 152. SURVEY OF MATHEMATICS II. This course continues the exploration of selected topics from the elementary and middle school mathematics curriculum, including rational and real numbers, probability, statistics, geometry, and measurement. Prerequisite: Mathematics 151 or permission of instructor. *Spring semester only, three hours.*

MATH 161. CALCULUS I. A first course in calculus that assumes no prior study of the subject. Topics include limits and continuity, differentiation, curve sketching, the fundamental theorem of calculus, definite and indefinite integrals, and applications. This course fulfills in part the Information Literacy (IL) requirement for the Mathematics major. Prerequisite: High school mathematics including algebra, analytic geometry, and trigonometry. Students may not receive credit for both Mathematics 141 and 161. *Semester course, four hours.*

MATH 162. CALCULUS II. A continuation of Math 161 covering the topics: exponential, logarithmic and inverse trigonometric functions, techniques of integration, parametric equations, sequences, infinite series, and Taylor series. This course fulfills in part the Information Literacy (IL) requirement for the Mathematics major. Prerequisite: Mathematics 161 or permission of instructor. *Semester course, four hours.*

MATH 201. STATISTICAL METHODS. An introduction to the basic methods and techniques of statistical inference including descriptive measures, probability distributions, tests of hypotheses, interval estimation, and analysis of variance. Students may only receive credit for one of Mathematics 201, Management 201, or Psychology 201. *Fall semester only, three hours.*

MATH 210. COMBINATORICS. A study of the foundations of mathematics in the context of combinatorial analysis with an emphasis on mathematical writing. Representative topics include set theory, functions, proof techniques, induction, enumeration techniques, the pigeon-hole principle, binomial and multinomial coefficients, the principle of inclusion-exclusion, and generating functions. Corequisite: Mathematics 162. *Fall semester only, three hours.*

MATH 213. DISCRETE MATHEMATICS FOR COMPUTER SCIENCE. A study of the foundations of mathematics with an emphasis on concepts related to theoretical mathematical methods and computer science. Topics include mathematical logic, set theory, algorithms, complexity of algorithms, integers, a variety of proof techniques, combinatorics, relations, graphs and digraphs, and trees. Corequisite: Mathematics 162. *Fall semester only, four hours.*

MATH 214. APPLIED PROBABILITY AND LINEAR ALGEBRA. An overview of probability and linear algebra, with an emphasis on applications and concepts for computer science. Topics include probability distributions, counting, conditional probability, matrix operations, vector properties, change of bases, Markov chains, and eigenvalues and eigenvectors. Students will not be permitted to receive credit for all three of Math 214, 222, and Math 331. Prerequisite: Mathematics 162. *Spring semester only, four hours.*

MATH 222. LINEAR ALGEBRA. A study of the theory of matrices and their applications including systems of linear equations, determinants, vector spaces, eigenvalues and eigenvectors, linear

transformations, diagonalization, and Gram-Schmidt orthogonalization. Prerequisite: Mathematics 162. *Spring semester only, four hours.*

MATH 230. SURVEY OF MATHEMATICS III. This course explores the mathematical topics that form the grades 5-8 curriculum, including ratios and proportions, algebra, relations and functions, geometry, statistics, and probability. Prerequisite: Mathematics 152 or permission of instructor. *Alternate years, fall semester only, three hours.*

MATH 232. FINANCIAL MATHEMATICS. This is an introduction to interest theory and the mathematics of investment. The topics include interest rates, valuation of annuities, loan repayment, valuation of bonds, rates of return, term structure, and cash-flow duration and immunization. This course is intended to prepare students for the actuarial exam FM/2. Prerequisites: Mathematics 141 and Accounting 201. Corequisite: Finance 301. *Fall semester only, three hours.*

MATH 237. TOPICS FOR MATH EDUCATION. This course will be taught in an independent format covering mathematical material useful for math education majors. Students may only receive credit for this course once. Prerequisite: Mathematics 151 or 152, or permission of instructor. *Semester course, one hour.*

MATH 240. MATHEMATICS FOR SECONDARY EDUCATION. A course designed for the secondary teacher candidate in mathematics. Topics covered are history of mathematics; logic; graph theory; proportional reasoning; problem solving and critical thinking; geometry; algebra and functions; and other material applicable to secondary teachers of mathematics. Required for mathematics secondary education majors. Open to elementary and middle level education majors with mathematics concentration. Prerequisite: Mathematics 210, 213, 222, or corequisite with Mathematics 222. *Semester course, three hours.*

MATH 260. INDEPENDENT STUDY. Individual study of specialized topics in mathematics. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

MATH 261. CALCULUS III. The final course in the three-semester calculus sequence covering: polar coordinates, vectors and the geometry of three-dimensional space, vector functions, partial derivatives, multiple integrals and vector calculus. This course fulfills in part the Information Literacy (IL) requirement for the Mathematics major. Prerequisite: Mathematics 162. *Semester course, four hours.*

MATH 262. DIFFERENTIAL EQUATIONS. A study of the elementary theory and methods for analytic solution of ordinary differential equations, with applications, including first order equations, higher order linear equations, Laplace transform methods, and series solutions (time permitting). Prerequisite: Mathematics 162. *Spring semester only, three hours.*

MATH 263. NUMERICAL DIFFERENTIAL EQUATIONS. The study and application of numerical methods for solving differential equations including Euler's method, Runge-Kutta methods, multi-step methods, and solutions of systems of equations. Prerequisite/corequisite: Mathematics 262 or permission of the instructor. *Spring semester only, one hour.*

MATH 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in mathematics. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

MATH 303. COLLEGE GEOMETRY. This course explores various modern geometries from an axiomatic point of view. Topics such as sets of axioms and finite geometries, Euclidean and non-Euclidean geometries, geometric transformations, and possibly neutral geometry will be thoroughly examined. Prerequisite: Mathematics 210 or 213, and 222. *Spring semester only, three hours.*

MATH 305. PUTNAM PROBLEM GROUP. The Putnam Exam is a national undergraduate mathematics competition consisting of 12 challenging problems administered on the first Saturday in December. The course will consist of meeting once a week to work on problems and discuss problem solving strategies. Students not meeting the prerequisite are invited to audit the course. Students may take the course up to four times for credit. Prerequisite: Mathematics 162.
Fall semester only, one hour.

MATH 306. ACTUARIAL MATHEMATICS. An in-depth study of calculus-based probability and statistics topics covered by the Society of Actuaries first actuarial exam, Exam P. Topics include general probability, univariate probability distributions, and multivariate probability distributions with applications to risk and insurance. Students taking this course are required to obtain the recommended review manual and to register for and take Exam P. Students may take this course at most twice for credit. Corequisite: Mathematics 332 and instructor approval. *Semester course, one hour.*

MATH 307. INVESTIGATIONS IN MATHEMATICS RESEARCH. An introduction to mathematics research. Teams of two to four students will investigate mathematical phenomena experimentally, detect patterns, create conjectures, and attempt to prove the conjectures and verify the patterns. Students may take this course at most three times for credit. Prerequisite: Mathematics 210 or 213. *Spring semester only, one hour.*

MATH 331. THEORY OF STATISTICS I. An introduction to probability and mathematical statistics, including counting techniques; probability spaces; independence; conditional probability; distributions of discrete and continuous random variables; expected values, moments and moment-generating functions; random vectors and their distributions. A computer algebra system is used. Corequisite: Mathematics 261 or permission of instructor. *Fall semester only, three hours.*

MATH 332. THEORY OF STATISTICS II. The continued study of mathematical statistics including transformations of random variables and vectors; sampling distributions; the Central Limit Theorem; properties of point estimates of parameters; maximum-likelihood estimates; confidence intervals; hypothesis testing; contingency tables; simple and linear regression; and one-way analysis of variance. Statistical software and a computer algebra system are used. Prerequisite: Mathematics 331. *Spring semester only, three hours.*

MATH 360. INDEPENDENT STUDY. An opportunity for junior and senior students, with a minimum of eighteen hours in mathematics, to do intensive independent study of specialized topics. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

MATH 365. COMPLEX VARIABLES. An introduction to the theory of functions of a complex variable including complex numbers; analytic functions; derivatives and integrals of functions of a complex variable; Taylor and Laurent series; and mappings by functions of a complex variable. Prerequisite: Mathematics 261. *Alternate years, fall semester only, three hours.*

MATH 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in mathematics. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

MATH 390. STUDIES IN MATHEMATICS. A series of lectures/discussions on topics from such areas as combinatorics, number theory, algebra, geometry, statistics, computer applications, analysis, and topology. Prerequisite: Permission of the instructor. *Semester course, one, two or three hours.*

MATH 421. ABSTRACT ALGEBRA. An introduction to formal axiomatic systems and the elementary theory of groups and rings. Prerequisite: Mathematics 210 or 213, and 222.
Semester course, three hours.

MATH 422. NUMBER THEORY. This course is, in part, an application of some of the ideas encountered in Math 421. Various results from the theory of finite groups, particularly results about

the structure of finite cyclic groups, will be established and used to prove classical results of elementary number theory. The course will also cover arithmetic functions, the structure of Z_n^*, special numbers, and additional topics as time allows. Prerequisite: Mathematics 421.

Alternate years, spring semester only, three hours.

MATH 460. INDEPENDENT STUDY. An opportunity for junior and senior students, with a minimum of eighteen hours in mathematics, to do intensive independent study of specialized topics. Junior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MATH 465. CLASSICAL ANALYSIS. This course is an introduction to real analysis and includes a rigorous treatment of the structure of the real number system; sequences; limits; continuity; uniform continuity; open and closed sets; compact sets; differentiation; the Riemann integral; and possibly topics from infinite series; sequences and series of functions; pointwise and uniform convergence; and possibly generalizations to *n*-dimensional or metric spaces. Prerequisites: Mathematics 210 or 213, and Mathematics 261. *Semester course, three hours.*

MATH 466. INTERMEDIATE ANALYSIS. A continuation of the study of real analysis through rigorous treatment of material in several of the following areas: metric spaces and continuity; multivariable calculus; convergence and completeness; measure theory; and functional analysis. Prerequisites: Mathematics 222 and 465. *Alternate years, spring semester only, three hours.*

MATH 467. TOPOLOGY. This course introduces students to point-set topology: a way of generalizing ideas from geometry and analysis. Topics include basic set theory, topological spaces, bases, metric spaces, continuity, connectedness, separation axioms, convergence, compactness and metrizability. Prerequisites: Mathematics 222 and either Mathematics 210 or 213.

Alternate years, fall semester only, three hours.

MATH 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in mathematics. Senior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MATH 488. SEMINAR IN MATHEMATICS. A course for seniors that includes independent reading and research, student presentations, preparation for the Graduate Record Exam and Major Field Test and faculty lectures on advanced topics in mathematics. This course, in part, satisfies the requirements for a Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) course for the mathematics major. Prerequisite: Senior standing. *Semester course, two hours.*

MATH 499. HONORS IN MATHEMATICS. A course available to junior and senior students on an individual basis. Prerequisite: Consent of the department chair.

Semester course, one, two or three hours.

DEPARTMENT OF MECHANICAL ENGINEERING

Dr. Clauss, Chair; Dr. Bardy, Assistant Chair; Dr. E. Anderson, Dr. Dixon, Dr. Fair, Dr. Li, Dr. Richards, Dr. Ulrich. Additional Instructional Faculty: Mr. Montgomery.

MECHANICAL ENGINEERING DEPARTMENT MISSION STATEMENT, OBJECTIVES, AND OUTCOMES

Mechanical Engineering (ME) is a broad discipline that develops technological solutions to societal problems in order to benefit mankind. Examples of areas where we find these challenges are transportation, power generation, energy conversion, product design, manufacturing, sustainability, and production. Mechanical engineering education includes such diverse topics as materials science, engineering design and analysis, thermodynamics, solid and fluid mechanics, heat transfer, manufacturing processes, system dynamics, teamwork, and project management. Our graduates apply their skills to a vast array of problems. For instance, mechanical engineers develop renewable energy systems, new

medical devices, more fuel-efficient automobiles, climate control systems for buildings, and so on. Mechanical engineers enjoy employment in a wide variety of areas including research, design, manufacturing, production, technical marketing and sales, and management. At Grove City College, we strive to develop our students' God given talents and abilities so that they may better serve the world around them.

The ME Department at Grove City College offers a program leading to the Bachelor of Science in Mechanical Engineering (BSME) degree. The program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Mechanical engineers must be proficient at both oral and written communications to communicate their solutions and designs with other engineers and society in general. Toward that end, the ME curriculum incorporates Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) instruction within the core course requirements.

The mission of our program is to produce graduates who can pursue leadership roles in the mechanical engineering profession. The following program educational *objectives* enable GCC mechanical engineers to meet this mission in the years following graduation:

1. Graduates will be successfully employed in the mechanical engineering profession or in an alternative field. Many of our graduates will assume leadership roles in these positions and be recognized as effective communicators and team members.
2. Graduates will engage in life-long learning through self-study, employer sponsored continuing education courses or workshops, or through formal graduate level education leading to an advanced degree.
3. Graduates will demonstrate ethical behavior in the workplace and will carry out their professional duties in a manner that is consistent with a Christian worldview.

Our graduates possess the following student *outcomes* upon graduation:

1. An ability to identify, formulate, and solve complex problems applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

These outcomes are met over a 4-year curriculum that starts with an exposure to the fundamentals of science and engineering and culminates in our senior capstone design experience.

Freshman Year–Introduction to the fundamentals of chemistry, physics, calculus, engineering computations, the profession of engineering, and the design process. Students also learn to use Creo, a state-of-the-art CAD tool.

Sophomore Year–Emphasis on the analysis of problems in statics, dynamics, materials science, and thermodynamics, and on the design and manufacturing process; students are exposed to modern machine shop practice through the fabrication of an individual project involving machining, fabrication, and assembly.

Junior Year–Analysis skills are honed in engineering math, circuit analysis, fluid mechanics, heat transfer, and mechanics of materials. Sound experimental and design techniques are reinforced in the required laboratory sequence. Students receive a solid grounding in dynamic systems analysis and simulation, machine design, and stress analysis. Opportunities for international study and travel are offered through our partnership with affiliated universities in Nantes, France.

Senior Year–A major, year-long capstone design experience includes the design and realization of an engineering product. Extensive computer-aided design and manufacturing includes the use of Creo to document, analyze and fabricate designs. Advanced manufacturing techniques covered include conventional and investment casting, injection molding, CNC machining, and TIG/MIG welding. To assure the ability to work professionally, seniors must complete at least 13 hours of Mechanical Engineering electives, choosing a minimum of three credit hours in a given systems area. In addition, at least six credit hours must be 400-level courses and a maximum of 4 credit hours may be earned through one and two credit courses.

Mechanical Systems Electives:

MECE 303 Computer-Aided Manufacturing
MECE 390 Special Mechanical Engineering Topics
MECE 408 Mechanical Vibrations
MECE 410 Kinematics and Dynamics of Machinery
MECE 415 Finite Element Analysis
MECE 418 Human-Powered Vehicle Design
MECE 428 Biomechanics
MECE 498 Honors in Mechanical Engineering
MECE 260, 360, 460 Independent Study – indicated by instructor
MECE 270, 370, 470 Independent Research – indicated by instructor
ENGR 411 Control Systems
ROBO 301 Introduction to Robotics
ROBO 302 Mobile Robots

Thermal Systems Electives:

MECE 321 Advanced Thermodynamics
MECE 391 Special Mechanical Engineering Topics
MECE 414 Principles of HVAC
MECE 416 Survey of Renewable Energy Systems
MECE 421 Applied Fluid Mechanics
MECE 499 Honors in Mechanical Engineering
MECE 260, 360, 460 Independent Study – indicated by instructor
MECE 270, 370, 470 Independent Research – indicated by instructor

Technical Electives:

MECE 304 Design of Experiments
MECE 305 Introduction to LabVIEW
MECE 331 Engineering Management and Cross-Cultural Communication
MECE 260, 360, 460 Independent Study – indicated by instructor
MECE 270, 370, 470 Independent Research – indicated by instructor

ENGR 301 Ethics in Engineering and Robotics
ENGR 390 Special Engineering Topics
ENGR 412 Modern Control Theory
NOTE: Additional electives may be offered at the discretion of the department.

Course Requirements for Bachelor of Science Degree in Mechanical Engineering—100 hours

Mechanical Engineering Core (48 hours)
Mechanical Engineering 107, 109, 120, 201, 210, 211, 212, 214, 251, 252, 311, 312, 316, 325, 326, 351, 352, 401; Mechanical Engineering or Robotics 451 and 452.

Engineering Core (6 hours)
Engineering 156, 402, and Electrical Engineering 210.

Math/Science Core (33 hours)
Chemistry 105*; Engineering 274**; Mathematics 161, 162, 261, 262; Physics 101, 102; and one math/science elective chosen from Astronomy 206, 207; Biology 101, 102; Chemistry 112 and 114, 227, 241, 345; Mathematics 210, 213, 222, 331; Physics 234, or 402.

Mechanical Engineering Electives* (13 hours)**
A total of 13 credit hours must be fulfilled. Choose a minimum of three hours from each systems area. At least six hours must be 400-level courses and a maximum of four credit hours may be earned through one and two credit courses.

Mechanical Systems electives
Mechanical Engineering 260, 270, 303, 360, 370, 390, 408, 410, 415, 418, 428, 460, 470, 498, Engineering 411, Robotics 301, or 302.

Thermal Systems electives
Mechanical Engineering 260, 270, 321, 360, 370, 391, 414, 416, 421, 460, 470, or 499.

Technical Electives
Mechanical Engineering 260, 270, 304, 305, 331, 360, 370, 460, 470, Engineering 301, 390, or 412.

**Students who take Chemistry 111, 112, 113, and 114 are exempt from the Chemistry 105 requirement and fulfill the Math/Science elective.*

***Students who complete Mathematics 213, 222, and 331 are exempt from the Engineering 274 requirement.*

****A combined total of up to three credit hours for independent study, independent research, faculty-mentored research, and honors courses can be applied towards the Engineering Electives requirements.*

Courses that count in the Mechanical Engineering major quality point average (MQPA):
All courses with "MECE" and "ROBO" prefix; ELEE 210; ENGR 156, 301, 320, 390, 392, and 402. A minimum MQPA of 2.00 is required to graduate.

MECHANICAL ENGINEERING (MECE) MAJOR
FOUR-YEAR PLAN

FRESHMAN YEAR	**1st Sem.**	**2nd Sem.**	**SOPHOMORE YEAR**	**1st Sem.**	**2nd Sem.**
Chemistry 105	4	-	Mathematics 261-262	4	3
Engineering 156	-	2	Mech. Engineering 201	3	-
Mathematics 161-162	4	4	Mech. Engineering 210	-	3
Mech. Engineering 107	2	-	Mech. Engineering 211-212	3	3
Mech. Engineering 109	2	-	Mech. Engineering 214	-	3
Mech. Engineering 120	-	3	Mech. Engineering 251-252	1	1
Physics 101	-	4	Physics 102	4	-
HUMA 102 - WRIT 101	3	3	SSFT course	2	-
Physical Education	1	-	Humanities 202	-	3
	16	16		17	16
JUNIOR YEAR			**SENIOR YEAR**		
Elec. Engineering 210	-	3	Engineering 402	-	1
Engineering 274	3	-	Mech. Engineering 401	3	-
Math/Science Elective	3	-	Mech. Engineering 451-452	1	3
Mech. Engineering 311-312	3	3	Mech. Engineering Electives	9	4
Mech. Engineering 316	-	3	Humanities 301-303	3	3
Mech. Engineering 325-326	3	3	General Elective	-	4
Mech. Engineering 351-352	1	1		16	15
Social Science Course	-	3			
Humanities 200	3	-			
	16	16			

Course Requirements for a minor in Robotics (19-20 hours)

A minor in Robotics will consist of Robotics 301, 302; Engineering 301; a 3-4 credit robotics-related capstone project; and nine hours from Computer Science 445, Electrical Engineering 310, Engineering 411, Engineering 412, Mechanical Engineering 316, or Mechanical Engineering 410 or Engineering 390 Introduction to Mechatronics.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

ENGINEERING CORE COURSES (ENGR)

ENGR 156. INTRODUCTION TO ENGINEERING. Introduces students to the engineering profession and the design process. Course lectures and assignments include the design process; problem definition and solution; oral and written communications; group dynamics; public responsibility; current global engineering challenges; and engineering ethics. A group design project is required. *Semester course, two hours.*

ENGR 274. MATHEMATICAL METHODS IN ENGINEERING. A course for engineering and science majors covering selected topics in probability and statistics, linear algebra, discrete mathematics, and numerical methods as applied to the solution of problems in engineering and science. Students who receive credit for Mathematics 213, 222, and 331 may not receive credit for Engineering 274. Prerequisite: Mathematics 162. S*emester course, three hours.*

ENGR 301. ETHICS IN ENGINEERING AND ROBOTICS. This course investigates ethical decision-making from a Christian perspective as it applies to engineering and robotics. It includes an overview of approaches to ethical decision-making, as well as particular issues raised by the robotics field, such as robots making military decisions, privacy issues with in-home robots, issues with emotional bonds, etc. *Semester course, one hour.*

ENGR 390. SPECIAL ENGINEERING TOPICS. Special topics in the areas of new engineering development based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration.
Semester course, one, two, three or four hours.

ENGR 402. ENGINEERING ECONOMY. Principles and methods for analyzing the economic feasibility of engineering projects including interest, depreciation, rate-of-return, economic life, replacement costs, and comparison of alternative designs. Aspects of this course will be involved in the final phase of Senior Capstone projects. Prerequisite: Mathematics 141 or 161. Corequisite: Mechanical Engineering 452, Electrical Engineering 452, or Robotics 452.
Spring semester only, one hour.

ENGR 411. CONTROL SYSTEMS. A study of the design and analysis of feedback control systems using classical techniques. Topics include modeling of mechanical and electrical dynamic systems, a review of Laplace transform techniques, steady-state error, transient response, stability, root locus design methods, Bode analysis/stability margins, and Bode compensator design. Includes MATLAB/Simulink simulations and hands-on projects. Prerequisite: Electrical Engineering 210 or 201; Mechanical Engineering 316 or Electrical Engineering 321; and Engineering 274, Mathematics 214, or Mathematics 222. *Fall semester only, three hours.*

ENGR 412. MODERN CONTROL THEORY. Analysis and design of feedback control systems using modern control modeling and design techniques. Topics include state space modeling of mechanical and electrical systems, design of state-space controllers and observers, Kalman filtering, and an introduction to advanced topics such as robust control, optimal control (LGR/LQG), and others. Includes MATLAB/Simulink simulations and hands-on projects. Prerequisite: Engineering 411.
Spring semester only, three hours.

ENGR 480. INTERNSHIP IN ENGINEERING. An opportunity for junior or senior engineering majors to participate in an extended work experience (six months or more) under the supervision of an on-site manager and a department faculty member. Products of the internship will include an evaluation by the on-site manager, a journal of the internship experience, and a paper describing the experience and relating it to academic theory. This course may be repeated a maximum of three times. Prerequisite: Permission from the department chair. *Semester course, one hour.*

MECHANICAL ENGINEERING (MECE)

MECE 107. ENGINEERING GRAPHICS. A study of the principles of engineering drawing, including detailed part drawings. Students will learn to read and create detailed technical drawings. Topics include orthographic and pictorial views, section views, and auxiliary views. Dimensioning and tolerancing in accordance with ANSI Y14.5, including geometric dimensioning and tolerancing is emphasized. *Fall semester only, two hours.*

MECE 109. INTRO TO SOLID MODELING. An introduction to basic CAD modeling. Students will be introduced to mechanical engineering terminology and mechanical components such as screws, gears, shafts, etc. An introduction to CAD solid modeling with Creo, including basic part and assembly models is also included. A small design project will introduce CAD design tools, including additive manufacturing. *Fall semester only, two hours.*

MECE 120. NUMERICAL COMPUTING FOR MECHANICAL ENGINEERS. This course introduces students to applied numerical computation, with an emphasis on solving typical mechanical engineering problems. Sequential logic programming is taught using MATLAB. Topics include array and scalar operators, program control elements, graphic and text I/O, internal and user-defined functions. Students are introduced to numerical methods such as root finding, solutions to systems of linear equations, linear regression, and numerical integration and differentiation. Corequisites: Mathematics 161 and Physics 101. *Semester course, three hours.*

MECE 201. FUNDAMENTALS OF MATERIALS SCIENCE. Models of crystalline and molecular structures are presented to explain the diverse properties of metallic; polymeric and ceramic materials; including atomic bonding and crystal structure; elastic and plastic deformation; phase of equilibria and transformation; thermal processing; and corrosion. Prerequisite: Chemistry 105.
Fall semester only, three hours.

MECE 210. DESIGN FOR MANUFACTURING. Introduction to manufacturing processes, including part characteristics, economic production quantities, materials, and design recommendations. Emphasis is placed on process and material selection and design for manufacturability. The course includes plant tours. Prerequisites: Mechanical Engineering 107, 109, and 201. *Spring semester only, three hours.*

MECE 211. MECHANICS I. Static equilibrium of particles and rigid bodies; analysis of structures, trusses, and cables; friction; centroids and moments of inertia; methods of virtual work; and energy are addressed. Engineering applications are also incorporated. Prerequisites: Mathematics 162, Mechanical Engineering 120, and Physics 101. *Fall semester only, three hours.*

MECE 212. MECHANICS II. A study of rectilinear and curvilinear motion of particles and rigid bodies; kinetics of particles and rigid bodies; relative motion, work, and energy; impulse and momentum are taught along with engineering applications. Prerequisite: Mechanical Engineering 211.
Spring semester only, three hours.

MECE 214. THERMODYNAMICS. The study of the fundamental principles and some applications of classical thermodynamics. Topics include properties of pure substances; heat, work, and mass transfer; first law of thermodynamics; second law of thermodynamics; entropy; gas power cycles; vapor power cycles; and refrigeration cycles. Prerequisite: Mathematics 162.
Spring semester only, three hours.

MECE 251. MECHANICAL SYSTEMS LABORATORY I. A lab course designed to introduce students to engineering practices including dimensioning, gaging and measuring, machining operations, manufacturing processes, and engineering standards for fasteners, threads, etc. Hands-on application will be taught through an individual project involving machining, fabrication, and assembly. Materials testing laboratories are also part of this course. Mechanical Engineering 251 is designed to fulfill the requirements for an Information Literacy (IL) course in the Mechanical Engineering major. Prerequisite: Sophomore standing in mechanical engineering.
Fall semester only, one hour.

MECE 252. MECHANICAL SYSTEMS LABORATORY II. A lab course designed to introduce students to engineering experimental techniques, including planning, controls, basic instrumentation, and basic data analysis. Prerequisites: Sophomore standing in mechanical engineering and Mechanical Engineering 251. *Spring semester only, one hour.*

MECE 260. INDEPENDENT STUDY. Individual study of specialized topics in mechanical engineering. Sophomore standing, permission of the department chair, and a faculty sponsor are required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards one of the following: Mechanical Systems, Thermal Systems, or Technical Electives. *Semester course, one, two or three hours.*

MECE 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in mechanical engineering. Sophomore standing, permission of the department chair, and a faculty sponsor are required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards one of the following: Mechanical Systems, Thermal Systems, or Technical Electives. *Semester course, one, two or three hours.*

MECE 303. COMPUTER-AIDED MANUFACTURING. Introduction to computer-aided manufacturing using Creo CAD/CAM software. Students will learn to program CNC machine tools, including three axis mills, lathes, and wire EDM machines, as well as basic pattern and mold design

for sand casting, injection molding, and vacuum forming. Prerequisite: Mechanical Engineering 107 and 109. *January intersession only, three hours.*

MECE 304. DESIGN OF EXPERIMENTS. Design of experiments for engineering design optimization and analysis. An introduction to the statistically designed experimental techniques commonly used by engineers for design and process optimization, including ANOVA, factorial, CCD, Taguchi, and I-optimal designs. Prerequisite: Junior status or permission of instructor.
Spring semester, one hour.

MECE 305. INTRODUCTION TO LABVIEW. Introduction to LabVIEW. Presents the fundamentals of the LabVIEW graphical programming environment. This visual programming language is from National Instruments and is commonly used for data acquisition, instrument control, and industrial automation. Students will gain a basic understanding of LabVIEW programming practices and will develop LabVIEW applications for data acquisition, data analysis, and real-time control. Prerequisite: Mechanical Engineering 120 or permission of instructor.
Spring semester, one hour.

MECE 311. MECHANICS OF MATERIALS. Fundamentals of mechanics of materials, including stress and strain; axial loading; Hooke's Law and Poisson's ratio; torsion; bending; transverse loading; stress and strain transformations; beam analysis; and buckling. Prerequisites: Mathematics 262 and Mechanical Engineering 210 and 212. *Fall semester only, three hours.*

MECE 312. STRESS ANALYSIS AND DESIGN OF MACHINE COMPONENTS. Application of stress analysis to static, fatigue, and surface fatigue failures. Design of shafts, including limits and fits and bearing selection. Design and selection of machine elements such as screws, bolted joints, springs, gears, brakes, etc. Prerequisite: Mechanical Engineering 311.
Spring semester only, three hours.

MECE 316. SYSTEM DYNAMICS. Modeling and analysis of dynamic systems consisting of mechanical, electrical, and electromechanical elements. Development of system models using transfer functions, block diagrams, and state variable methods. System analysis in the time and frequency domains. Includes MATLAB/Simulink simulations. Prerequisites: Mathematics 262 and Mechanical Engineering 212; or Physics 303 and either Mechanical Engineering 120 or Computer Science 141.
Spring semester only, three hours.

MECE 321. ADVANCED THERMODYNAMICS. Application of thermodynamic principles. Topics include reviewing equations of state, properties, conservation of mass, conservation of energy, second law of thermodynamics, and cycles; exergy; property relationships; gas and gas-vapor mixtures; air conditioning; chemical reactions; chemical and phase equilibrium; and compressible-fluid flow. Prerequisite: Mathematics 261 and Mechanical Engineering 214.
Fall semester only, three hours.

MECE 325. FLUID MECHANICS. The study of steady and unsteady flow of primarily incompressible fluids; the application of the conservation laws of mass, momentum, and energy to fluid systems; the control volume approach to distributed systems; and the application of experimental techniques to problems. Prerequisites: Mathematics 261, 262; and Mechanical Engineering 211 or Physics 303 (for majors) or Physics 121 (for non-majors). *Fall semester only, three hours.*

MECE 326. HEAT TRANSFER. The fundamentals of heat transfer by conduction, convection, and radiation; application to practical heat transfer devices; engineering analysis of heat exchangers; and design problems solved by analytical, numerical, and computer methods. Prerequisites: Mechanical Engineering 214, Physics 340, or Chemistry 346; and Mechanical Engineering 325.
Spring semester only, three hours.

MECE 331. ENGINEERING MANAGEMENT & CROSS-CULTURAL COMMUNICATION. Introduction to the tools needed to manage technical projects in an international setting including (1) cross-cultural communication/management, with a special emphasis on French vs. U.S.

language/culture, and (2) selected introductory engineering management and design process topics. Classroom lectures and case studies are supplemented with cultural field trips and interaction with French engineering students taking this class. Open to all GCC students studying in France; facilitated by the GCC European Study Center (ESC) and the University of Nantes (ONIRIS) in Nantes, France. This course can be used to satisfy a portion of the mechanical systems or thermal systems elective requirements in Mechanical Engineering. *Fall semester only, three hours.*

MECE 351. INSTRUMENTATION LABORATORY. A lab course that reinforces the lab techniques introduced in Mechanical Engineering 251-252. Experiments chosen from strain analysis, first and second order systems, and vibration analysis. Mechanical Engineering 351 is designed to fulfill the requirements for a Writing Intensive (WI) course in the Mechanical Engineering major. Prerequisite: Mechanical Engineering 252. Corequisite: Mechanical Engineering 311.
Fall semester only, one hour.

MECE 352. THERMAL/FLUIDS LABORATORY. A lab course that reinforces the lab techniques introduced in Mechanical Engineering 251-252. Experiments chosen from thermodynamics, fluid mechanics, and heat transfer. Corequisite: Mechanical Engineering 326.
Spring semester only, one hour.

MECE 360. INDEPENDENT STUDY. Individual study of specialized topics in mechanical engineering. Junior standing, permission of the department chair, and a faculty sponsor are required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards one of the following: Mechanical Systems, Thermal Systems, or Technical Electives. *Semester course, one, two or three hours.*

MECE 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in mechanical engineering. Junior standing, permission of the department chair, and a faculty sponsor are required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements.
Semester course, one, two or three hours.

MECE 390. SPECIAL MECHANICAL ENGINEERING TOPICS. Special topics in mechanical engineering based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration. This course can be used to satisfy a portion of the mechanical systems elective requirements in Mechanical Engineering.
Semester course, one, two, three or four hours.

MECE 391. SPECIAL MECHANICAL ENGINEERING TOPICS. Special topics in mechanical engineering based on student demand and faculty interest. Specific subject matter varies each semester with prerequisites and credit hours announced in advance of registration. This course can be used to satisfy a portion of the thermal systems elective requirements in Mechanical Engineering.
Semester course, one, two, three or four hours.

MECE 401. CAPSTONE DESIGN I. Completion of the senior design project. A study of the principles and methods of designing mechanical engineering systems in today's society, including the design process; decision making in design; engineering economics; analysis and verification of performance; and environmental impact. Prerequisite: Senior standing in mechanical engineering. Corequisite: Mechanical Engineering 451. *Fall semester only, three hours.*

MECE 408. MECHANICAL VIBRATIONS. A study of the dynamic response of lumped parameter systems with one and two degrees of freedom subjected to periodic and non-periodic excitation; applications to the control of undesirable vibrations in machines; theory of seismic instruments; and an introduction to distributed parameter systems. Prerequisites: Mechanical Engineering 311 and 316.
Fall semester only, three hours.

MECE 410. KINEMATICS AND DYNAMICS OF MACHINERY. Modeling, analysis, and design of linkages, cams, and gear trains, including machine dynamics. Introduction to dynamic systems

modeling using computer-aided analysis, including Creo. Prerequisite: Mechanical Engineering 311. *Spring semester only, three hours.*

MECE 414. PRINCIPLES OF HEATING, VENTILATING, AND AIR CONDITIONING. Analysis and design of components and systems used to condition air in buildings. Topics include air-conditioning systems, psychrometrics, conditioning processes, indoor air quality, heat transfer, solar radiation, heating loads, cooling loads, annual energy usage, pumps and piping, fans and ducts, and refrigeration equipment. Prerequisite: Mechanical Engineering 326. *Fall semester only, three hours.*

MECE 415. FINITE ELEMENT ANALYSIS. A study of the finite element method and its application to mechanical engineering problems. Topics include basic concepts; stiffness matrices; truss structures; flexure elements; method of weighted residuals; interpolation functions; and applications to heat transfer, fluid mechanics, solid mechanics, and structural dynamics. Prerequisites: Engineering 274, Mechanical Engineering 312 and 326. *Fall semester only, three hours.*

MECE 416. SURVEY OF RENEWABLE ENERGY SYSTEMS. A survey of the technical and social aspects of alternative and renewable energy systems. Topics include hydropower, wind energy, solar power, biomass, fuel cells and hydrogen economy, nuclear power, and geothermal and ocean energy. Prerequisite: Mechanical Engineering 326. *Spring semester only, three hours.*

MECE 418. HUMAN-POWERED VEHICLE DESIGN. Computer-aided modeling, analysis, and design of human-powered vehicles for land, water, and air. Includes analysis of vehicle dynamics and handling, performance predictions, and CAD-based design tools integrating dynamic models with Creo models. Two lectures and one lab per week. Corequisites: Mechanical Engineering 311 and 325. *Semester course, three hours.*

MECE 421. APPLIED FLUID MECHANICS. Advanced treatment and application of the equations and empirical data that describe fluid phenomena in both internal and external fluid systems. Introduction to techniques important to research and design in fluid applications, specifically computational and experimental fluid dynamics. Among the topics covered are potential flow, added mass, boundary layer flow, lubrication theory and bearings, turbomachinery, turbulence, non-Newtonian fluids, compressible flow, and biofluid dynamics. Prerequisite: Mechanical Engineering 326. *Fall semester only, three hours.*

MECE 428. BIOMECHANICS. The course will explore the key topics within the contemporary field of biomechanics—the application of mechanics to biological systems—with the goal of preparing students for further work in cutting-edge fields such as biomedical engineering, novel propulsion systems, and other biologically-inspired engineering. Among the topics covered are biomaterials, mechanical properties of biological structures, biomimetic robotics, terrestrial locomotion, swimming, flying, prosthetics, external and internal fluid flows, efficiency, blood flow, experimental techniques, and flow visualization. Prerequisites: Mechanical Engineering 311 and 325, or Physics 232, or Mathematics 161 and Physics 121 and Biology 102. *Spring semester only, three hours.*

MECE 451. CAPSTONE DESIGN LABORATORY I. An advanced lab course where students learn techniques and engage in experiments relating to their senior group design project. Written reports and oral presentations are required. Prerequisites: Senior standing in engineering or permission of instructor. *Fall semester only, one hour.*

MECE 452. CAPSTONE DESIGN LABORATORY II. An advanced lab course requiring student teams to complete their group design project. Written reports and oral presentations are required. Mechanical Engineering 452 is designed to fulfill the requirements for a Speaking Intensive (SI) course in the Mechanical Engineering major. Prerequisite: Senior standing in engineering and one of Electrical Engineering, Mechanical Engineering, or Robotics 451. *Spring semester only, three hours.*

MECE 460. INDEPENDENT STUDY. Individual study of specialized topics in mechanical engineering. Senior standing, permission of the department chair, and a faculty sponsor are required. A combined total of up to three credit hours for independent study, independent research, and honors

courses can be applied towards one of the following: Mechanical Systems, Thermal Systems, or Technical Electives. *Semester course, one, two or three hours.*

MECE 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in mechanical engineering. Senior standing, permission of the department chair, and a faculty sponsor are required. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards one of the following: Mechanical Systems, Thermal Systems, or Technical Electives. *Semester course, one, two or three hours.*

MECE 498. HONORS IN MECHANICAL ENGINEERING. Seniors (and in some instances, juniors) who have shown special aptitude in mechanical engineering may, with consent of the department, undertake special research and design problems. This course may be used to satisfy a portion of the mechanical systems elective requirements in Mechanical Engineering. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements. Cannot be repeated for more than a total of three credit hours. *Semester course, one, two or three hours.*

MECE 499. HONORS IN MECHANICAL ENGINEERING. Seniors (and in some instances, juniors) who have shown special aptitude in mechanical engineering may, with consent of the department, undertake special research and design problems. This course may be used to satisfy a portion of the thermal systems elective requirements in Mechanical Engineering. A combined total of up to three credit hours for independent study, independent research, and honors courses can be applied towards the Mechanical Engineering elective requirements. Cannot be repeated for more than a total of three credit hours. *Semester course, one, two or three hours.*

ROBOTICS (ROBO)

ROBO 301. INDUSTRIAL ROBOTS. Presents the fundamentals of robot mechanisms, kinematics, dynamics, and controls. Topics include forward and inverse kinematics, differential motion and velocities, dynamics and force control, path and trajectory planning, actuators and drive systems, and sensors used in robotic systems. The basics of robotic control systems are briefly presented. The use of vision systems in robotics is introduced. Two lectures and one lab per week. Prerequisite: Electrical Engineering 321 or Mechanical Engineering 316, robotics minor, or permission of instructor.
Fall semester only, three hours.

ROBO 302. MOBILE ROBOTS. An introduction to the basic principles of mobile robots, including mechanical, sensory, and cognitive systems necessary for successful operation. Topics will include hardware, locomotion, sensors, control schemes, localization, and navigation. Hands-on lab experiences with real robots and a final project supplement lecture material. Two lectures and one lab per week. Prerequisites: Physics 101; Mathematics 261; and Engineering 274 or Mathematics 214.
Spring semester only, three hours.

ROBO 451. CAPSTONE DESIGN PROJECT I. An advanced lab course where students learn techniques and engage in experiments relating to their senior group design project. Written reports and oral presentations are required. Prerequisite: Senior standing in engineering or permission of the instructor. *Fall semester only, one hour.*

ROBO 452. CAPSTONE DESIGN PROJECT II. An advanced lab course requiring student teams to complete their group design project. Written reports and oral presentations are required. Robotics 452 is designed to fulfill the requirements for the Speaking Intensive (SI) course in the Electrical and Computer Engineering or Mechanical Engineering major. Prerequisite: Senior standing in engineering and one of Electrical Engineering, Mechanical Engineering, or Robotics 451.
Spring semester only, three hours.

DEPARTMENT OF MODERN LANGUAGES

Dr. Madsen, Chair; Ms. Carruth, Dr. Jackanich, Dr. Killam, Dr. Knupp.

Language Placement Guidelines

Students who have had prior exposure to a language but have not taken an AP exam or received college credit in the language must take the Foreign Language Placement Exam before registering for their first modern languages course at Grove City College. This includes incoming freshmen, transfer students, and current students.

Students may take the placement exam any time during the spring or summer in anticipation of fall registration or during the fall or winter in anticipation of spring registration. Scores will remain valid for six months. After initial placement, a student's progression into advanced courses will be determined by successful completion of prerequisites.

Students should only take the exam once within a six-month period unless given permission to repeat the exam by the department. They are expected to adhere to Grove City College's Academic Integrity Policy. That is, the work should be the student's own and should not contain that which has been knowingly obtained from another. The use of notes, dictionaries, translating tools, textbooks, and all other forms of assistance during the placement test are prohibited.

If it becomes apparent that a student in his/her first term of study of a language at Grove City College has been placed in a class that is inappropriate for his/her abilities, he/she may be placed back or advanced at the option of the Department. This may be done no later than the end of the third week of classes. Note: A student may repeat a course in which he/she previously earned a grade of 'C-' or lower. A student who passes a course with a 'C' grade or higher may not later repeat the same class for credit or audit unless the course is designated as repeatable for multiple credits.

Note: **Language study is progressive and sequential. For example, 101 must be followed by 102, 102 by 201, and 201 by 202.**

Course Requirements for Bachelor of Arts Degree in French—30 hours

French Core Requirements (30 hours):

French 201 and 202, or two 300-level French electives (excluding French 362); French 301; 305 or 340; French 307; 308; two French literature courses; and two French electives (six hours) at the 300-level (excluding French 362).

Courses that count in the French major quality point average (MQPA):

All courses with "FREN" prefix, excluding FREN 101 and FREN 102. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Arts Degree in French and K-12 Education Certification—75 hours

French Core Requirements (32 hours):

French 201 and 202, or two 300-level French electives; French 301; 305 or 340; French 307; 308; 362; two French literature courses; and two French electives (six hours) at the 300-level.

Education Requirements (43 hours):

Education 202*, 203, 204, 215, 307, 316, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Course Requirements for Bachelor of Arts Degree in Spanish—33 hours

Spanish Language Core Requirements (18 hours):

Spanish 201 and 202, or two 300-level Spanish electives (excluding Spanish 362); Spanish 301, 303, 305, and 306.

Literature and Culture Core Requirements (9 hours):

Spanish 344; one course from Spanish 320, 330, or 331; and one course from Spanish 321, 325, 328.

Spanish Electives (6 hours):

Any two 300- or 400-level Spanish courses (excluding Spanish 362).

Courses that count in the Spanish major quality point average (MQPA):

All courses with "SPAN" prefix, excluding SPAN 101, 102, 201 and 202. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Arts Degree in Spanish and K-12 Education Certification—78 hours

Spanish Language Core Requirements (20 hours):

Spanish 201 and 202, or two 300-level Spanish electives; Spanish 301, 303, 305, 306, and 362.

Literature and Culture Core Requirements (9 hours):

Spanish 344; one course from Spanish 320, 330, or 331; and one course from Spanish 321, 325, 328.

Spanish Electives (6 hours):

Any two 300- or 400-level Spanish courses.

Education Requirements (43 hours):

Education 202*, 203, 204, 215, 307, 316, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

International Business Major

This program leads to a Bachelor of Science degree, combining business and modern language studies. Consult the Department of Management and Marketing for program requirements.

Classical Languages

Consult the Department of Biblical and Religious Studies and Philosophy for Biblical Hebrew, New Testament Greek, and Latin course descriptions as well as the requirements for the Classical Studies minor.

Writing Intensive/Speaking Intensive/Information Literacy Studies

The Department of Modern Languages stresses the acquisition of skills in speaking, writing, and analysis/research. The following courses are designated as Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL): French 307 (WI); French 305, 340 (SI); French 320, 32l, 325, 326, 331, 332 (IL) for the French major; and Spanish 303 (SI); Spanish 320, 321, 325, 328, 330, 331, 333 (WI) and (IL) for the Spanish major.

Course Requirements for a minor in French (18 hours)

A minor in French will consist of 18 hours of French courses beyond French 101 and 102, excluding French 362.

Course Requirements for a minor in International Studies (24 hours)

The International Studies Minor contributes to both the professional development and intellectual enrichment of undergraduate students at Grove City College, enabling them to develop a broad understanding of the rapidly changing global environment for which they will be equipped to function during their professional careers. This minor is interdisciplinary, comprised of a small cluster of courses in foreign language and culture, with a contemporary focus. The International Studies Minor provides for mid-level competency in a modern language other than the student's native tongue, broad knowledge of other cultures, and understanding of the complexity and interconnectedness of the modern world.

General Requirements:

Students must possess modern language competency as demonstrated by completing at least the second-year course sequence (201-202) or equivalent in a widely spoken modern language other than the student's native language. Students must also complete an approved international academic experience (Study Abroad) at the college level for a semester or year, or three credits of international internship experience.

Core Requirements (6 hours):

Two courses from: Communication Arts 225, Global Studies 300, Psychology 200, or Sociology 103.

Elective Requirements (15 hours):

Five courses from the following, with no more than three courses from any one of the four emphases areas.

International Politics, History, Religion

History 141, 212, 224, 231, 263, 265; Political Science 333, 341, 342, 344; or Religion 248.

Global Economies

Economics 202, 206; International Business 205, 416, 417, or 445.

Global Society & Culture

French 305, 301, 321, 326, 340; Global Studies 310; Sociology 241, 375; Spanish 320, 333; Spanish 322 or 323; or Spanish 326 or 327.

International Art, Music, English

English 205, 206, 250, 324, 325; or Music 330.

Global Capstone (3 credits):

All students are required to complete a capstone experience which involves enrolling in *Internship, Independent Research, or Honors* for 3 credits. The exact parameters of this capstone requirement are determined in consultation with the student and their capstone advisor.

The capstone project must synthesize the student's course of study by incorporating at least two of the four emphases in design and/or content and must demonstrate their understanding of how to communicate their research in a global context to an audience of their own choosing. Examples may include an international internship, service-learning program, or field work that results in a substantive paper, grant, or project. The following courses satisfy this requirement: Communication Arts 470 Independent Research; 480 Internship; or 499 Honors in Communication. If the student chooses the internship option, this must be a different internship from the one conducted for the general requirements.

Course Requirements for a minor in Spanish (18 hours)

A minor in Spanish will consist of 18 hours of Spanish courses beyond Spanish 201 and 202, including Spanish 301; Spanish 303; Spanish 305; one Spanish literature and culture course (Spanish 320, 330, or 331); one Latin American literature and culture course (Spanish 321, 325, or 328); and three hours of 300 or 400-level Spanish electives, excluding Spanish 362.

Course Requirements for a minor in Spanish for the Professions (18 hours)

A minor in Spanish for the Professions will consist of 18 hours of Spanish courses beyond Spanish 201 and 202, including Spanish 301, 303, 306, and 315; Spanish 316 or 317; and one literature and culture course (Spanish 320, 321, 325, 328, 330, or 331).

Study Abroad

Study abroad is strongly encouraged for language majors. Selection of a program and of specific courses takes place in consultation with the Office of Global Programs, the Chair of the Department of Modern Languages, individual modern language advisors, and the Registrar. Detailed information about the Grove City College Study Abroad program is available by accessing www.gcc.edu/academics/oie. Language majors seeking assistance regarding program options, transfer of credits, application forms, deadlines, letters of recommendation, and other matters related to study abroad may contact the Modern Languages Department Chair.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

FRENCH (FREN)

FREN 101. ELEMENTARY FRENCH I. The first of a two-semester elementary sequence that moves students towards functional proficiency in the four skill areas (reading, writing, listening, speaking) while increasing their cultural literacy of the French-speaking world. Intended for students with little or no prior exposure to the French language, this course emphasizes successful communication in real-life situations and a basic understanding of the main elements of French grammar. Students who have previously studied French must take the placement exam before enrolling in French 101. *Fall semester only, three hours.*

FREN 102. ELEMENTARY FRENCH II. The second of a two-semester elementary sequence that moves students towards functional proficiency in the four skill areas (reading, writing, listening, speaking) while increasing their cultural literacy of the French-speaking world. Prerequisite: French 101 or placement exam. *Spring semester only, three hours*.

FREN 201. INTERMEDIATE FRENCH I. The first of a two-semester intermediate sequence that moves students towards functional proficiency in the four skill areas (reading, writing, listening, speaking) while increasing their cultural literacy of the French-speaking world. Students progress from formulas and single sentence utterances to paragraph-length discourse. Prerequisite: French 102 or placement exam. *Fall semester only, three hours.*

FREN 202. INTERMEDIATE FRENCH II. The second of a two-semester intermediate sequence that moves students towards functional proficiency in the four skill areas (reading, writing, listening, speaking) while increasing their cultural literacy of the French-speaking world. Students develop increasing communicative sophistication. Prerequisite: French 201 or placement exam.
Spring semester only, three hours.

FREN 260. INDEPENDENT STUDY. Individual study of specialized topics in French. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

FREN 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in French. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

FREN 301. UNDERSTANDING FRANCE AND THE FRENCH. Students gain insight into modern day France and her people through an understanding of her recent history, institutions, conventions, and cultural products. A variety of sources (articles, films, essays, etc.) will facilitate discussion of key aspects of French society. Prerequisite: French 202 or placement exam.
Alternate years, fall semester only, three hours.

FREN 305. TOPICS IN FRENCH AND FRANCOPHONE STUDIES. Students hone skills of description, narration, and evaluation through the observation and discussion of various cultural elements of the French-speaking world. Different topics will be studied in different semesters and may include gastronomy, fashion, sports, music, places (such as Paris), or major cultural figures. This course fulfills the Speaking Intensive (SI) requirement for the French major and may be repeated for credit provided the topic is different. Prerequisite: French 202 or placement exam.
Alternate years, fall semester only, three hours.

FREN 307. FRENCH COMPOSITION AND STYLE. The purpose of this course is to refine students' writing ability in French. Through a variety of assignments arranged around specific genres (e.g. a movie review, a persuasive essay, a job cover letter, etc.), students will hone their ability to communicate clearly and with greater sophistication. To prepare for writing their own compositions, students will read texts in the target genres in order to identify effective argumentation, style, and tone. In addition to covering more advanced skills, the course will review key grammatical structures according to the needs of the class. This course fulfills the Writing Intensive (WI) requirement for the French major. Prerequisite: French 202 or placement exam. *Fall semester only, three hours*.

FREN 308. APPLIED PHONETICS. Offering both a theoretical and practical approach to the French phonetic system, this course guides students through the sounds and prosody of French as contrasted with English with the help of the International Phonetic Alphabet. In addition to learning to identify and transcribe all French phonemes, students will improve their own pronunciation and intonation via extensive oral practice and individualized feedback. Required of French majors and those desiring teacher certification in French. Prerequisites: French 202 or placement exam.
Alternate years, spring semester only, three hours.

FREN 315. BUSINESS FRENCH. Through this course, students acquire the linguistic skills and cultural information they need to prepare for the *Chambre de commerce et d'industrie de Paris* examinations. They familiarize themselves with business practices of the Francophone world. They are exposed to key French business topics and to essential career practices, as well as to cultural concepts particular to French businesses. Areas of concentration are: 1. la correspondance; 2. la micro-informatique, Internet, le courrier électronique; 3. la recherche d'un emploi; 4. la typologie des entreprises; 5. l'organisation des enterprises; 6. le marketing; 7. la banque et les moyens de paiement; 8. les transports et le commerce international. Prerequisite: French 300-level course.
Offered periodically, semester course, three hours.

FREN 320. MEDIEVAL AND EARLY MODERN FRENCH LITERATURE. A survey of French literature from its beginnings in the eleventh century to the seventeenth century. Through fiction, poetry, essays, treatises, emblems, and images, this course explores the relationships among literary creation, political events, religious movements, artistic innovations, and scientific discoveries. Readings may include *La Vie de Saint Alexis*, *The Song of Roland*, Marguerite de Navarre, Rabelais, Ronsard, Montaigne, Descartes, Pascal, and Madame de Lafayette. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 300-level course or by permission.
Offered periodically, semester course, three hours.

FREN 321. 18th THROUGH 21st CENTURY FRENCH LITERATURE. An introduction to French literary development from the eighteenth to the twenty-first century. From Louis XIV's absolute monarchy through the French Revolution to two World Wars and decolonization, these centuries provoked rich and diverse literary production, often as a means of social and political engagement. Authors may include Voltaire, Rousseau, Diderot, Stendhal, Hugo, Balzac, Flaubert, Zola, Modiano, Duras, Queneau, Condé, Ben Jelloun, Nothomb, etc. Prerequisite: French 300-level course or by permission. *Offered periodically, semester course, three hours.*

FREN 325. FRENCH THEATRE. A course designed to give students an overview of the history and evolution of theater in the French-speaking world. Readings may include Molière, Corneille, Racine, Beaumarchais, Hugo, Sartre, Ionesco, Beckett, and Césaire. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 300-level course or by permission. *Offered periodically, semester course, three hours.*

FREN 326. *LE CINÉMA PAR LA CONVERSATION*. This course begins with analyses, commentaries, and discussions of French films with which spectators in non-francophone countries are most likely to be familiar. Progressively, the emphasis shifts to films of the *Occupation* (1940-1944) and of the *Nouvelle Vague* (the 1960s), films which have been held significant in aesthetic, social, or moral terms by prominent critics and historians of French cinema. The materials and strategies used are meant to stimulate interest in the target language, to bridge the gap between "skill" and creative courses, and to develop the language proficiency of advanced students, as well as their ability to express themselves creatively in French. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 300-level course or by permission. *Offered periodically, semester course, three hours.*

FREN 331. POETRY. The goal of this course is to enable students to express themselves with increased sophistication and to practice "*explication de textes*", this staple of French classical education. Students will study the biographies and also selected texts by nineteenth- and twentieth-century poets from France and the francophone world: Hugo, Nerval, Baudelaire, Mallarmé, Verlaine, Rimbaud, Valéry, Senghor, and Césaire. This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 300-level course or by permission. *Offered periodically, semester course, three hours.*

FREN 332. CARIBBEAN AND AFRICAN LITERATURE IN FRENCH. The goal of this course is to familiarize students with the vibrant literary scene in French-speaking regions outside of Europe, with an emphasis on the Caribbean, North Africa, and Sub-Saharan Africa. The course may include novels, essays, or short stories by authors such as Suzanne Dracius (Martinique), Patrick Chamoiseau (Martinique), Albert Memmi (Tunisia), Assia Djebar (Algeria), Alain Mabanckou (Republic of Congo), and Leonora Miano (Cameroon). This course fulfills the Information Literacy (IL) requirement for the French major. Prerequisite: French 300-level course, or by permission. *Alternate years, spring semester only, three hours.*

FREN 340. MOMENTS IN FRENCH AND FRANCOPHONE HISTORY. Through the study of historical events and developments in the French-speaking world, students expand on the skills of description and narration acquired in French 305 and move toward more sophisticated modes of discourse, such as discussing abstract ideas, constructing arguments, and hypothesizing. Different topics will be studied in different semesters and may include the beginnings of the French language, philosophical ideas (e.g. Enlightenment, existentialism), Medieval culture, the Renaissance, Louis XIV and Versailles, French colonization and its aftermath, France in WWII, etc. This course fulfills the Speaking Intensive (SI) requirement for the French major and may be repeated for credit provided the topic is different. Prerequisites: French 300-level course, or by permission. *Spring semester only, three hours.*

FREN 360. INDEPENDENT STUDY. Individual study of specialized topics in French. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

FREN 362. ASPECTS OF LANGUAGE LEARNING. A course designed to provide opportunities to teach various grammar aspects of the French language, and to examine and implement a variety of technical aspects and resources in the foreign language curriculum in preparation for student teaching. Teacher candidates will regularly reflect on their teaching experiences and will develop a portfolio of materials representing their teaching in the target language. Required of all students desiring teacher certification in a foreign language. *Spring semester of the sophomore year, two hours.*

FREN 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in French. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

FREN 390. STUDIES IN FRENCH. Readings and discussion of topics in literature or language. Subject matter varies. *Semester course, one, two or three hours.*

FREN 460. INDEPENDENT STUDY. Individual study of specialized topics in French. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

FREN 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in French. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

SPANISH (SPAN)

SPAN 101. ELEMENTARY SPANISH I. This course is intended for students with no previous study of Spanish or those who have had minimal exposure to the language. An introduction to Spanish, stressing the spoken language and giving practice in grammar, reading, writing, and developing an awareness of culture. Students who have previously studies Spanish must take the placement exam before enrolling in Spanish 101. *Fall semester only, three hours.*

SPAN 102. ELEMENTARY SPANISH II. Continuation of Spanish 101. Further development of basic communication skills including listening, speaking, reading, writing, and developing an awareness of culture. Prerequisite: Spanish 101 or placement exam.
Spring semester only, three hours.

SPAN 201. INTERMEDIATE SPANISH I. This course is appropriate for students who have completed Spanish 101 and 102. A review of elementary Spanish and an intensive study of grammar and vocabulary in oral and written practice, readings from selected texts, and the development of cultural awareness. Prerequisite: Spanish 102 or placement exam. *Fall semester only, three hours.*

SPAN 202. INTERMEDIATE SPANISH II. Continuation of Spanish 201. The intensive study of grammar and vocabulary in oral and written practice, readings from selected texts, and the development of cultural awareness. Further development of basic communication skills in listening, speaking, reading, and writing. Prerequisite: Spanish 201 or placement exam.
Spring semester only, three hours.

SPAN 260. INDEPENDENT STUDY. Individual study of specialized topics in Spanish. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

SPAN 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Spanish. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

SPAN 300. TOPICS IN CONTEMPORARY CULTURE. This course allows in-depth learning of topics of key importance in the Hispanic world with a particular emphasis on contemporary life. Subject matter will vary and may include urbanism, sports, major cultural figures, history, politics,

social movements, and religion and will be approached through film, media, literature, music, and visual arts. This course may be repeated for credit provided the topic is different. Prerequisite: Spanish 295 or 301. *Offered periodically, semester course, three hours.*

SPAN 301. INTRODUCTION TO LITERATURE. Introduction to techniques of literary analysis and study of representative works by major authors of the Spanish-speaking world. Prerequisite: Spanish 202 or placement exam. *Fall semester only, three hours.*

SPAN 303. CONVERSATION. This course examines contemporary cultural and social trends in Spain, the United States, and Latin America and trains students in interpersonal and presentational communication with a professional focus while offering a review of key grammatical structures. This course fulfills the Speaking Intensive (SI) requirements for the Spanish major. Required of all Spanish majors, minors, and those desiring teacher certification in Spanish. Prerequisite: Spanish 202.
Spring semester only, three hours.

SPAN 305. APPLIED PHONETICS. This course is a systematic examination of how the sounds of Spanish are produced. By learning and applying phonetic and phonological principles, this course is intended to help students improve their pronunciation. It also introduces the linguistic variation of Spanish in Spain, the United States, and Latin America. Students learn to identify and comprehend the dialects of Spanish and will be trained in using this skill in professional settings. Required of all Spanish majors and those desiring teacher certification in Spanish. Prerequisite: Spanish 202.
Spring semester only, three hours.

SPAN 306. ADVANCED COMMUNICATION. This class offers an engaging encounter with advanced Spanish grammar by creating real-life scenarios and situations where students can apply what they learn. Students practice how to target their discourse to specific audiences using particular formats, for instance, presentations, interviews, formal and informal letters, emails, and other academic and professional reports. Required of all Spanish majors and of those desiring teacher certification in Spanish. Prerequisite: Spanish 202. *Fall semester only, three hours.*

SPAN 315. PROFESSIONAL SPANISH. This course focuses on the evolution and current state of fields such as business, healthcare, translation, and media in Spain, the United States, and Latin America. The course will study historical and legal contexts, offer in-depth learning and practice of specific vocabulary and structures relevant to those fields, and develop cultural competency applicable to professional situations. This course also provides an opportunity for students to create a portfolio of documents in Spanish that may be used in a job search and, when possible, the completion of an applied learning project. Prerequisite: Spanish 295 or 301. *Offered periodically, semester course, three hours.*

SPAN 316. BUSINESS CULTURE IN THE HISPANIC WORLD. This course offers an overview of the process of industrialization and the evolution of the markets of goods and services in Latin America. Students also learn about salaries, labor contracts, and important cases involving business ethics. The course concludes with a study of the rise of Hispanic global brands and their impact in today's economy. Students read biographies, articles and short stories, and examine different types of media. Prerequisite: Spanish 295 or 301. *Alternate years, spring semester only, three hours.*

SPAN 317. SPACE AND URBAN DESIGN IN LATIN AMERICA. In the Latin American plaza, many different conceptions of how public space is defined and utilized converge, from the Mesopotamian boulevard to the markets, teocallis, and kanchas of the indigenous civilizations of the New World. Through a journey that highlights the key ideas and moments of the history of public space, this class examines the creation of the plaza in Latin America and invites students to make connections with the evolution of Main Street in the United States. Students also explore questions relative to the future of public areas and how redevelopment efforts may affect culture and society in general. Prerequisite: Spanish 295 or 301. *Alternate years, spring semester only, three hours.*

SPAN 319. INTRODUCTION TO SPANISH CIVILIZATION. A study of Spanish history and civilization from pre-Roman times to the present. Through readings, videos, discussions and

presentations, students explore the social, political, economic and cultural developments of Spain and its people. Prerequisite: Spanish 295 or 301. *Offered infrequently, three hours.*

SPAN 320. CONTEMPORARY SPAIN. A study of the events and ideas which have shaped Spain with an emphasis on literary works and authors, cultural achievements and traditions, and the evolution of socioeconomic and political structures from the 20th century to the present. Through readings, videos, discussions and presentations, students will develop an understanding of how Spain's rich history contributes to the daily life of contemporary Spain (politics, religion, family, social issues and other current topics) and influences the ways in which Spaniards view themselves and the world. Students will read online Spanish news sources regularly. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: Spanish 295 or 301. *Alternate years, spring semester only, three hours.*

SPAN 321. FOUNDATIONS OF LATIN AMERICAN SOCIETIES. An exploration of the civilization, culture, literature, and artistic forms of pre-Columbian societies and the changes, challenges, and opportunities brought by the processes of conquest and colonization. Students read firsthand accounts and chronicles of this period as well as the questions and objections raised by members of the Church to how colonization was being implemented. The course examines the contributions of the African populations to Latin American societies and concludes with a study of the Baroque period, including architecture, poetry, and painting. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: 300-level Spanish course. *Alternate years, fall semester only, three hours.*

SPAN 322. LATIN AMERICAN CIVILIZATION AND CULTURE I. A survey of the twenty-one Latin American republics, their history and civilization, people and society, arts and letters, customs, geography, and cultural accomplishments. Prerequisite: Spanish 295 or 301. *Offered infrequently, three hours.*

SPAN 323. LATIN AMERICAN CIVILIZATION AND CULTURE II. A cultural understanding of Latin America including identity issues, "mestizaje", socio-political characteristics, and patterns of thought and expression in language, literature, philosophy, and art. The course also examines the effects of the Spanish conquest upon the development of Latin American society. It is not necessary to take Spanish 322 before Spanish 323. Prerequisite: Spanish 295 or 301. *Offered infrequently, three hours.*

SPAN 325. INDEPENDENCE AND NATIONAL IDENTITIES IN LATIN AMERICA. A study of the situation of the Spanish colonies in the 18th century and its most recognized cultural productions. This course explores the causes and effects of independence, the power struggles that ensued after the foundation of the Latin American nations, and the role played by foreign powers in the establishment of national identities during the end of the 19th century. Students read travel accounts, chronicles of everyday life, manifestos, and the foundational narratives of the young republics, including novels and poetry. The course concludes with the social and aesthetic conditions that produced *Modernismo*, one of Latin America's most recognized artistic periods. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: 300-level Spanish course beyond 301. *Alternate years, fall semester only, three hours.*

SPAN 326. TRENDS IN LATIN AMERICAN LITERATURE. A study of the literature of Latin America from the pre-Columbian era to the beginning of the 20th century. Prerequisite: 300-level Spanish course beyond 301. *Alternate years, fall semester only, three hours.*

SPAN 327. CONTEMPORARY LATIN AMERICAN AUTHORS. A survey with readings from representative works of the most important 20th century authors in Latin American and Mexican-American (Chicano) literature. Prerequisite: 300-level Spanish course beyond 301. *Offered infrequently, three hours.*

SPAN 328. PEACE AND RECONCILIATION IN LATIN AMERICA. An exploration of the most representative poetry, essays, film, short stories, art, and fiction of the 20th century in Latin America.

The course investigates the main causes and effects of civil conflict in this geographical area and introduces students to the reconciliation and peace processes that took place during the end of the last century. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: 300-level Spanish course beyond 301.

Alternate years, fall semester only, three hours.

SPAN 330. MEDIEVAL AND GOLDEN AGE SPAIN. A study of representative authors and works of the Middle Ages, Renaissance, and Golden Age. This course explores the development of Spanish poetry, narrative, and theater in its historical and cultural contexts. Readings may include the *Cantar de Mio Cid*, *El Conde Lucanor*, *El Libro de Buen Amor*, Jorge Manrique, Garcilaso de la Vega, Fray Luis de León, San Juan de la Cruz, *El Quijote*, Lope de Vega, etc. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: 300-level Spanish course beyond 301. *Offered periodically, semester course, three hours.*

SPAN 331. THE SPANISH ENLIGHTENMENT AND ITS AFTERMATH. A study of Spanish Romanticism, Realism, and Generation of '98 with readings from authors such as Espronceda, Zorrilla, Bécquer, Rosalía de Castro, Galdós, Pardo Bazán, Blasco Ibáñez, Unamuno, and Baroja. Nineteenth-century Spain is characterized by enormous political and social instability. This course explores how increasing tensions between *las dos Españas*, as well as other cultural developments inspired generations of authors. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: 300-level Spanish course beyond 301.

Offered periodically, semester course, three hours.

SPAN 333. CONTEMPORARY SPANISH AUTHORS. A survey with readings from representative authors and works of the 20th and 21st centuries. The literary works of contemporary Spain provide readers with a uniquely discerning view of Spanish history, society, and culture from the Second Republic through the Spanish Civil War and Franco's dictatorship, to democracy and the social and political movements of recent decades. Authors may include Alberti, Lorca, Buero Vallejo, Cela, Martín Gaite, Celaya, etc. This course fulfills the Information Literacy (IL) and Writing Intensive (WI) requirements for the Spanish major. Prerequisite: 300-level Spanish course beyond 301.

Offered periodically, semester course, three hours.

SPAN 335. FILM IN THE HISPANIC WORLD. An exploration of topics in film in the Hispanic world, including history, national productions, and genres. Prerequisite: 300-level Spanish course beyond 301. *Alternate years, fall semester only, three hours.*

SPAN 344. HISPANICS IN THE U.S. A study of the lifestyles, heritage, influence, thoughts~~,~~ and experiences of Cuban, Puerto Rican, Mexican American, Dominican~~,~~ and other Spanish speakers in the United States today. Through extensive reading, videos and discussion, we will explore contemporary issues and topics of interest such as demographics, immigration, discrimination, workers' rights, education, the arts, customs, beliefs and daily life. The course will foster a greater awareness of the similarities and differences existing between these communities, as well as their contributions to American society. Of particular interest to students of Spanish, sociology~~,~~ and political science. Required of all Spanish majors and those desiring teacher certification in Spanish. Prerequisite: Spanish 306. *Alternate years, fall semester only, three hours.*

SPAN 360. INDEPENDENT STUDY. Individual study of specialized topics in Spanish. Junior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

SPAN 362. ASPECTS OF LANGUAGE LEARNING. A course designed to provide opportunities to teach various grammar aspects of the Spanish language, and to examine and implement a variety of technical aspects and resources in the foreign language curriculum in preparation for student teaching. Teacher candidates will regularly reflect on their teaching experiences and will develop a portfolio of materials representing their teaching in the target language. Required of all students desiring teacher certification in a foreign language. *Spring semester of the sophomore year, two hours.*

SPAN 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Spanish. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

SPAN 390. STUDIES IN SPANISH. The topics of this course will vary each semester, addressing a variety of themes in linguistics or matters of cultural, social, and historical importance in the Hispanic world, including, but not limited to, Spain, Latin America, and Hispanics in the United States. Prerequisite: Spanish 295 or 301. *Offered periodically, one, two or three hours.*

SPAN 460. INDEPENDENT STUDY. Individual study of specialized topics in Spanish. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

SPAN 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in Spanish. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

SPAN 480. INTERNSHIP IN SPANISH. This is an opportunity for Spanish majors to participate in a meaningful learning experience under the supervision of both an employer and department faculty member. Most internships take place during the summer months. *Semester course, one to six hours.*

GLOBAL STUDIES (GOBL)

These courses are designed for students who wish to gain familiarity with cultures and literatures other than their own. Prior knowledge of a foreign language is unnecessary. None of the courses below may be counted toward fulfillment of the requirements for a language major.

GOBL 260. INDEPENDENT STUDY. Individual study of specialized topics in global studies. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

GOBL 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in global studies. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

GOBL 290. STUDIES IN MODERN LANGUAGE. Readings and discussion of topics in literature or language. Subject matter varies. *Semester course, one, two or three hours.*

GOBL 300. INTERNATIONAL MANNERS AND MORES. This course equips students to recognize and appreciate cultural differences, their origins, and how they manifest in a variety of contexts. By exploring other customs and ways of thinking, this course prepares students to engage respectfully and effectively on the international stage. Of special value for students of any major who plan to work, study, and/or travel abroad, yet the principles studied and skills gained apply just as readily to interacting with any community or institution with a particular way of doing things. *Offered periodically, semester course, three hours.*

GOBL 310. CHICANO AND LATIN AMERICAN LITERATURE. A survey with readings in English from representative literary works of Latin American and Chicano authors with an emphasis upon the study of Hispanic cultural identity and the integration of Christian thought. *Offered periodically, semester course, three hours.*

GOBL 360. INDEPENDENT STUDY. Individual study of specialized topics in global studies. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

GOBL 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in global studies. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

GOBL 390. STUDIES IN MODERN LANGUAGE. Readings and discussion of topics in literature or language. Subject matter varies. *Semester course, one, two or three hours.*

GOBL 460. INDEPENDENT STUDY. Individual study of specialized topics in global studies. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

GOBL 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in global studies. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

DEPARTMENT OF MUSIC

Dr. Tedford, Chair; Dr. Paparone, Assistant Chair; Dr. Carter, Dr. Erb, Dr. Hasper, Dr. Huebert, Dr. Mueller, Dr. Munson. Additional Instructional Faculty: Ms. Agnew, Mr. Bellassai, Dr. Billock, Mr. Byo, Mr. Cameron, Mr. Fennell, Dr. Fitch, Mr. Heasley, Mr. Heid, Ms. Kohanski, Ms. Kubik, Mr. May, Ms. Philipp, Dr. Piastro-Tedford, Mr. Scanga, Ms. Scott, Mr. Tessmer, Mr. Venesky, Mr. Wasilko, Mr. Weber, Mrs. Young.

Course Requirements for Bachelor of Music Degree in Music—46 hours

Music Core (27 hours):

Music 103, 104, 105, 106, 203, 204, 205, 206, 219, 331, 332, 335, 476; and Music 317 or 318.

Applied Music (12 hours):

Students must complete a minimum of eight (8) credits in their primary applied instrument and an additional component of four (4) credits of group music classes or private lessons in a secondary applied area(s). Students must take an applied lesson in their primary area every semester they are enrolled at the college.

Ensemble (7 hours with a total of 10 occurrences):

Students must complete 7 credit hours in any combination of Music 100 Band, Music 101 Concert Choir, or Music 102 Orchestra. An additional 3 ensembles (credit or non-credit) must be completed, choosing from Music 100, 101, 102, 114, 115, 116, 117, 118, or 119. Students whose primary applied area is vocal, wind, string, or percussion (not piano, organ, guitar, or harp) must participate in an ensemble using their primary applied area every semester that they are enrolled in the program. All other applied areas must enroll in at least one transcript-listed ensemble each semester. Students must have a total of 10 occurrences of enrolled ensembles (7 credited ensembles and 3 additional credit or non-credit ensembles) to fulfill the degree requirement.

Recital Attendance Requirement:

Music majors must register each semester for Music 199, which requires attendance at a predetermined number of faculty, senior and student recitals.

Recommended music electives include Music 223, 224, 230, 303, 304, 311, 325, 326, 329, 330, 360, 403, 426, 460, and 488.

Courses that count in the Music major quality point average (MQPA):

All courses with "MUSI" prefix. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Music Degree in Music/Business—63 hours

Music Core (28 hours):

Music 103, 104, 105, 106, 203, 204, 205, 206, 219, 221, 331, 332, 335; Music 476 or 480; and two courses from Music 107, 108, 207, 209, or 307.

Applied Music (8 hours):

Students must complete a minimum of eight (8) credits in their primary applied instrument. Students must take an applied lesson in their primary area every semester they are enrolled at the college.

Ensemble (7 hours with a total of 10 occurrences):

Students must complete 7 credit hours in any combination of Music 100 Band, Music 101 Concert Choir, or Music 102 Orchestra. An additional 3 ensembles (credit or non-credit) must be completed, choosing from Music 100, 101, 102, 114, 115, 116, 117, 118, or 119. Students whose primary applied area is vocal, wind, string, or percussion (not piano, organ, guitar, or harp) must participate in an ensemble using their primary applied area every semester that they are enrolled in the program. All other applied areas must enroll in at least one transcript-listed ensemble each semester. Students must have a total of 10 occurrences of enrolled ensembles (7 credited ensembles and 3 additional credit or non-credit ensembles) to fulfill the degree requirement.

Recital Attendance Requirement:

Music majors must register each semester for Music 199, which requires attendance at a predetermined number of faculty, senior and student recitals.

Business Concentration (18 hours):

Complete one concentration area choosing from:

Business: Accounting 201, 202; Finance 301; Management 103, 201; and Marketing 104.

Management: Management 103, 457, 475, and three courses from Management 302, 304, 307, 324, 424, 433, 450, 458, 464, and 465.

Marketing: Marketing 104, 315, 411, 415, 419, and once course from Marketing 412, 414, 417, and 420.

Courses that count in the Music/Business major quality point average (MQPA):

All courses with "MUSI", "ACCT", "ECON", "FNCE", "MARK", "MNGT" prefixes, excluding MNGT 106 and FNCE 105. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Music Degree in Music and PreK-12 Education Certification—98 hours

The Pennsylvania Department of Education recognizes this major as an approved program for meeting the requirements of the Instructional I (Provisional) teaching certificate. For teacher certification requirements, see the Dept. of Education section.

Music Core (39 hours):

Music 103, 104, 105, 106, 107, 108, 203, 204, 205, 206, 207, 209, 219, 221, 304 or 403, 307, 317, 318, 331, 332, 335, and 476.

Applied Music (10 hours):

Students must complete a minimum of a one-credit lesson for each semester except the student teaching semester in their primary applied instrument (seven credits); two (2) one-credit piano lessons or piano classes or Music 129; and one (1) one-credit guitar lesson or guitar class.

Ensemble (7 hours with a total of 10 occurrences):

Students must complete a total of 7 credit hours in Music 100 Band, Music 101

Concert Choir, and Music 102 Orchestra. Specifically, students must take a minimum of two hours of Music 100 (comprising of one semester of Marching Band and one semester of Concert Band); two hours of Music 101; two hours of Music 102; and one additional hour using their primary applied area. An additional 3 ensembles (credit or non-credit) must be completed, choosing from Music 100, 101, 102, 114, 115, 116, 117, 118, or 119. Students whose primary applied area is vocal, wind, string, or percussion (not piano, organ, guitar, or harp) must participate in an ensemble using their primary applied area every semester that they are enrolled in the program. All other applied areas must enroll in at least one transcript-listed ensemble each semester. Students must have a total of 10 occurrences of enrolled ensembles (7 credited ensembles and 3 additional credit or non-credit ensembles) to fulfill the degree requirement.

Recital Attendance Requirement:

Music education majors must register each semester, except the student teaching semester, for Music 199**,** which requires attendance at a predetermined number of faculty, senior, and student recitals.

Professional Education Requirements (42 hours):

Education 202*, 203, 488; Music Education 202, 213, 214, 313, 314, 372, 373, 435, 437; Psychology 102; Special Education 102, and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Music and PreK-12 Education Certification major quality point average (MQPA):

All courses with 'MUSE", "MUSI" and "EDUC" prefix; Psychology 102; Special Education 102 and 103. A minimum MQPA of 2.00 is required to graduate. The minimum QPAs to be certified are 3.00 for the cumulative CQPA and 2.75 for the MQPA.

Course Requirements for Bachelor of Music Degree in Music Performance—70 hours

Music Core (29 hours):

Music 103, 104, 105, 106, 203, 204, 205, 206, 219, 331, 332, 335, 376, 475; and Music 317 or 318.

Music Electives (10 hours):

Students must complete a minimum of ten (10) credits of Music elective courses.

Recital Attendance Requirement:

Students must register each semester for Music 199, which requires attendance at a predetermined number of faculty, senior and student recitals.

Performance Concentration (31 hours):

Choose one of the following options:

Instrumental Music Concentration

Concentration Core:

Music 304, 328, 334, and one of Music 107, 108, 207, or 307.

Ensemble (8 hours with a total of 16 occurrences):

Students must complete 8 credit hours through participation in Music 100 Band or Music 102 Orchestra every semester (8 semesters). An additional 8 ensembles (credit or non-credit) must be completed, choosing from Music 100, 102, 114, 115, 117, or 118. Students must have a total of 16 occurrences of enrolled ensembles (8 credited ensembles and 8 additional credit or non-credit ensembles) to fulfill the degree requirement.

Applied Music:
Students must complete a one-hour lesson in their primary applied instrument each semester (8 semesters).

Piano Concentration

Concentration Core:
Music 129, 224, and 327.

Ensemble (8 hours with a total of 12 occurrences):
Students must complete 8 credit hours through participation in Music 100 Band, Music 101 Concert Choir, or Music 102 Orchestra every semester (8 semesters). An additional 4 ensembles (non-credit) must be completed, choosing from Music 114, 115, 116, 117, 118, or 119. Students must have a total of 12 occurrences of enrolled ensembles (8 credited ensembles and 4 additional non-credit ensembles) to fulfill the degree requirement.

Applied Music:
Students must complete a one-hour piano lesson (Music 152) each semester (8 semesters). Students must also complete two (2) one-half hour organ lessons (Music 155).

Vocal Concentration

Concentration Core:
Music 209, 211, 223 (taken two times), and 333.

Ensemble (8 hours with a total of 16 occurrences):
Students must complete 8 credit hours through participation in Music 101 Concert Choir every semester (8 semesters). An additional 8 ensembles (non-credit) must be completed, choosing from Music 116 or 119. Students must have a total of 16 occurrences of enrolled ensembles (8 credited ensembles and 8 additional non-credit ensembles) to fulfill the degree requirement.

Applied Music:
Students must complete a one-hour voice lesson (Music 162) each semester (8 semesters).

Courses that count in the Music Performance major quality point average (MQPA):
All courses with "MUSI" prefixes. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for Bachelor of Music Degree in Music/Religion—72 hours

Music Core (32 hours):
Music 103, 104, 105, 106, 203, 204, 205, 206, 219, 221, 331, 332, 335, and 476; Music 317 or 318; and choose 2 courses from Music 107, 108, 207, 209, or 307.

Applied Music (10 hours):
Students must complete a minimum of eight (8) credits in their primary applied instrument and an additional component of two (2) credits of group music classes or private lessons in a secondary applied area(s). Students must take an applied lesson in their primary area every semester they are enrolled at the college.

Ensemble (7 hours with a total of 10 occurrences):
Students must complete 7 credit hours in any combination of Music 100 Band, Music 101 Concert Choir, or Music 102 Orchestra. An additional 3 ensembles (credit or non-credit) must be completed, choosing from Music 100, 101, 102, 114, 115, 116, 117, 118, or 119. Students whose primary applied area is vocal, wind, string, or percussion (not piano, organ, guitar, or harp) must participate in an

ensemble using their primary applied area every semester that they are enrolled in the program. All other applied areas must enroll in at least one transcript-listed ensemble each semester. Students must have a total of 10 occurrences of enrolled ensembles (7 credited ensembles and 3 additional credit or non-credit ensembles) to fulfill the degree requirement.

Recital Attendance Requirement:

Music majors must register each semester for Music 199, which requires attendance at a predetermined number of faculty, senior and student recitals.

Religion Requirements (23 hours):

Music 325; Religion 211, 212, 216, 246; one of Religion 221, 232, 237, 238, or 351; one of Religion 261, 341, or 362; and one of Religion 247, 251, 320, or 330.

Courses that count in the Music/Religion major quality point average (MQPA):

All courses with "MUSI" and "RELI" prefixes. A minimum MQPA of 2.00 is required to graduate.

Applied Music

Private lessons are offered in piano, organ, voice, strings, brass, woodwinds, guitar, harp, and percussion.

Piano classes offer group instruction in a piano lab to develop skills in playing solo literature, accompaniment, harmonization, and transposition. Classes are available at various levels of proficiency.

Voice classes offering group instruction in the techniques of voice production are available at beginning and intermediate levels.

Guitar classes are available at beginning and intermediate levels.

Ensemble

Credit may be earned for membership in performing organizations during each semester. Ensembles offered for credit include Concert Band, Concert Choir, Marching Band, and Orchestra. Other ensembles are available on a non-credit basis.

The Music Department has designated courses within the Bachelor of Music degree as Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL). These courses provide the necessary skills that will be needed by a professional music educator, performer, conductor, composer, or scholar. Music 203, and 204 are designated as SI courses. They provide the music student with skills necessary to speak in front of an audience as part of a performance and to deliver oral presentations in the music content area. Music 331 and 332 are designated as IL and WI courses. They provide the music student with an introduction to music research skills encompassing use of musical scores, recordings, traditional library sources and Internet use. Implementing the IL and WI skills provides the necessary skills used in all areas of the music profession. Music 221 is also an IL course. This music technology course provides the student with MIDI experience, sound technology, and information access through the Internet.

Course Requirements for a minor in Music (18 hours)

A minor in Music will consist of Music 103, 104, 105; Music 331 or 332; three, ½ hour juried lessons**,** choosing from Music 150-191; two semesters participation (for credit) in Music 100, 101, or 102; and four additional hours of Music electives. In addition, while enrolled as a music minor, students must register each semester for Music 198**,** which requires attendance at four recitals per semester; perform in at least two *student* recitals while enrolled as a music minor; and attend all Music Department meetings each semester.

Note: All prospective Music Minors must pass an audition before being admitted into the music minor program.

Course Requirements for a minor in Musical Theatre (21 hours)

A minor in Musical Theatre will consist of Music 103, 105, 161 or 162 (minimum 3 credits); Music 222, Music or Theatre 210, Theatre 251, and six additional hours choosing from Music 161, 162, 222, Physical Education 211, 213, 290 Jazz & Tap, Theatre 262, 320, and 351. Note: All prospective Musical Theatre minors must pass an audition before being admitted into the Musical Theatre minor program.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

MUSIC (MUSI)

MUSI 100. BAND. ***Fall Semester*****:** The college marching band begins its year with band camp one week before classes begin in the fall. The band performs at home football games, selected away football games, and high school band festivals. ***Spring Semester*****:** The symphonic band performs all styles of concert literature and presents two concerts during the semester. Auditions are held during the first week of each semester. *Semester course, one hour.*

MUSI 101. CONCERT CHOIR. Concert choir members prepare, study, and present choral literature. The choir performs two concerts each semester, as well as for special campus services when applicable. Auditions are held during the first week of each semester. *Semester course, one hour.*

MUSI 102. ORCHESTRA. The college orchestra performs a repertoire of classical as well as modern music. The orchestra performs one concert during the fall semester and two during the spring semester. Seating auditions are held the first week of fall semester, with new member auditions during the first week of spring semester. *Semester course, one hour.*

MUSI 103. MUSIC THEORY I. The first in a sequence of four music theory courses. This course covers fundamentals of music as well as beginning musical analysis, counterpoint, and four-part writing. Prerequisite: Music major, music minor, or with the permission of the instructor. *Semester only, three hours.*

MUSI 104. MUSIC THEORY II. The second in a sequence of four music theory courses. This course covers part-writing and analysis including all diatonic chords and tonic, dominant, and pre-dominant functions. Prerequisite: Music 103. *Semester only, two hours.*

MUSI 105. AURAL SKILLS I. An aural skills and sight singing class including melodic dictation, interval recognition, and chord identification. *Semester only, one hour.*

MUSI 106. AURAL SKILLS II. A continuation of Music 105, including all intervals, melodic dictation with large leaps, melodic and harmonic error detection, and chord identification including I, ii, iii, IV, V, and vi triads. Prerequisite: Music 105. *Semester only, one hour.*

MUSI 107. BRASS METHODS. Class instruction in the brass instruments with emphasis on development of the instrumental program in the schools. Prerequisite: Music major and minors only, or with the permission of the instructor. *Semester only, one hour.*

MUSI 108. PERCUSSION METHODS. Class instruction in percussion instruments with emphasis on development of the instrumental program in the schools. Prerequisite: Music major and minors only, or with the permission of the instructor. *Semester only, one hour.*

MUSI 114. GROVE CITY COLLEGE WIND ENSEMBLE. The Wind Ensemble is a select group of instrumental music students. This 45-member ensemble performs music of an academic nature

including contemporary, classical, and standard wind literature. Enrollment is open to students of all majors by audition. Auditions are held during the first week of spring semester.
Semester course, zero hours.

MUSI 115. GROVE CITY COLLEGE CHAMBER ORCHESTRA. The Chamber Orchestra is a select group of string players and other select wind and percussion students who must audition to join. This ensemble performs more challenging works from the string and chamber repertoires. The group presents music in each orchestra concert and other selected performances during the academic year. Auditions are held during the first week of fall semester. *Semester course, zero hours.*

MUSI 116. GROVE CITY COLLEGE TOURING CHOIR. The Touring Choir is comprised of selected vocalists who are committed to striving for excellence in the choral art. The choir sings for campus events, area churches, and takes a ten-day tour during a spring semester break. Auditions are held during the first week of fall semester. *Semester course, zero hours.*

MUSI 117. GROVE CITY COLLEGE JAZZ ENSEMBLE. The Jazz Ensemble is an advanced instrumental performing group. This group performs Swing, Bebop, Latin, Fusion, and other modern styles of jazz literature. Improvisational and advanced comping skills are highly desirable for membership in this ensemble. The Jazz Ensemble performs two college concerts per year in addition to several off-campus events. Musicians are selected by an open audition process during the 1st and 2nd week of the fall semester. *Semester course, zero hours.*

MUSI 118. GROVE CITY COLLEGE STAGE BAND. The Stage Band is an instrumental performing group that plays less demanding literature that develops jazz style, articulation, and phrasing. While improvisation skills are not required for this group, they are encouraged and developed. Musicians are selected by an open audition process during the 1st and 2nd week of the fall semester. The Stage Band typically performs two college concerts per year.
Semester course, zero hours.

MUSI 119. GROVE CITY COLLEGE SINGERS. The Grove City College Singers is comprised of auditioned female vocalists who are interested in singing a variety of sacred and secular vocal literature. In addition to two formal concerts during the academic year, the ensemble sings at a variety of campus venues, including alumni events, and a chapel service during the fall semester. Auditions are held during the first week of fall semester. *Semester course, zero hours.*

MUSI 123. PIANO CLASS I. The first in a sequence of piano classes, this course is intended for students with no background in piano playing. Skills developed in this course include: reading pitch and rhythm; repertoire in five-finger positions in various keys; white-key major and minor scales in two octaves, hands separately; introduction of changes of position (thumb crossing, finger substitution, extension, contraction, leap); I and V 6/5 chords in all major keys. *Semester course, one hour.*

MUSI 124. PIANO CLASS II. The second in a sequence of piano courses, this course is intended for students who have the basic skills developed in Music 123 Piano Class I. The course includes: repertoire with easy changes of position; black-key major and minor scales in two octaves, hands separately; chord progressions I-V in all major and minor keys; harmonization using I and V 6/5; and sight-reading in five-finger positions. See instructor for placement. *Semester course, one hour.*

MUSI 125. PIANO CLASS III. The third in a sequence of piano courses, this course is intended for students who have acquired the basic skills developed in Music 124 Piano Class II. The course includes: intermediate level repertoire by standard composers; all major scales, two octaves, hands together; chord progressions I-IV-V-I in major and minor keys; harmonization using I, IV 6/4, and V 6/5 chords in major and minor keys; and sight-reading easy pieces with minimal changes of position; and transposing of simple melodies. See instructor for placement. *Semester course, one hour.*

MUSI 126. PIANO CLASS IV. The fourth in a sequence of piano courses, this course is intended for students who have attained the skills covered in Music 125 Piano Class III. The course includes: standard repertoire at the intermediate and advanced-intermediate levels; all major scales, two octaves,

hands together; chord progressions I-IV-ii-V7-I in major and minor keys; harmonization using I, IV 6/4, and V 6/5 in various accompaniment patterns; sight-reading early intermediate repertoire; introduction of hymn playing, reading open score (SATB), and playing easy accompaniments. See instructor for placement. *Semester course, one hour.*

MUSI 129. ACCOMPANYING: VOCAL AND INSTRUMENTAL. This course provides instruction in the art of accompanying singers and instrumentalists on the piano. Various musical aspects are addressed, including phrasing and tempo, metrical pulse, tonal balance, recitative, orchestra reductions, alto and tenor clefs, transposing instruments, and musical style periods. Practical issues include page turning, proper deportment on stage, and rehearsal techniques. Prerequisite: Piano skills above the intermediate level. *Semester only, two hours.*

MUSI 131. ORGAN CLASS. This course is for music as well as non-music majors interested in the organ and its literature. The course also studies the history and design of the organ as well as acoustics and liturgical architecture. *Semester course, one hour.*

MUSI 135. GUITAR CLASS I. This is an introductory course designed to provide the student with a means of self-expression through playing the guitar. *Semester course, one hour.*

MUSI 137. GUITAR CLASS II. This course is for the student who has a basic knowledge of the guitar. This course includes teaching correct methods for learning flamenco techniques, aural and visual analysis, and performance harmonizing. *Semester course, one hour.*

MUSI 141. BEGINNING VOICE CLASS. This course teaches vocal production and song presentation. Individuals demonstrate and perform for class members. *Semester only, one hour.*

MUSI 144. INTERMEDIATE VOICE CLASS. This course teaches vocal production and song presentation for students with previous experience. Individuals demonstrate and perform for class members. *Semester only, one hour.*

MUSI 151-152. PRIVATE PIANO LESSON. This course consists of one-half hour for one credit (151) or one full hour for two credits (152) of individual instruction at the piano. The level of repertoire will depend upon the technical and musical abilities of the student.
Semester course, one or two hours.

MUSI 155-156. PRIVATE ORGAN LESSON. This course consists of one-half hour for one credit (155) or one full hour for two credits (156) of individual instruction at the organ. The student will study literature appropriate to the organ and also work on technical development.
Semester course, one or two hours.

MUSI 161-162. PRIVATE VOICE LESSON. This course consists of one-half hour for one credit (161) or one full hour for two credits (162) of private instruction in voice. Vocal production, language training, and performance skills for the individual singer are taught.
Semester course, one or two hours.

MUSI 163-164. PRIVATE STRING LESSON - CELLO. This course consists of one-half hour for one credit (163) or one full hour for two credits (164) of individual instruction on the cello. Students will improve technical skill as well as become familiar with string literature for the cello.
Semester course, one or two hours.

MUSI 165-166. PRIVATE STRING LESSON - VIOLIN/VIOLA. This course consists of one-half hour for one credit (165) or one full hour for two credits (166) of individual instruction on the violin or viola. Students will improve technical skill as well as become familiar with string literature for the violin or viola. *Semester course, one or two hours.*

MUSI 167-168. PRIVATE BRASS LESSON - FRENCH HORN. This course consists of one-half hour for one credit (167) or one full hour for two credits (168) of individual instruction on French horn.

Included in the instruction are techniques for developing embouchure; fingerings and their alternates; and solo repertoire for the French horn. *Semester course, one or two hours.*

MUSI 169-170. PRIVATE BRASS LESSON - TROMBONE. This course consists of one-half hour for one credit (169) or one full hour for two credits (170) of individual instruction on the trombone. Special emphasis is placed on slide positions, embouchure, trigger fingerings, and appropriate repertoire. *Semester course, one or two hours.*

MUSI 171-172. PRIVATE BRASS LESSON - TRUMPET. This course consists of one-half hour for one credit (171) or one full hour for two credits (172) of individual instruction on the trumpet. The student will become familiar with solo repertoire as well as fingerings and their alternates, tone quality, embouchure, and breathing techniques. *Semester course, one or two hours.*

MUSI 173-174. PRIVATE BRASS LESSON - BARITONE/TUBA. This course consists of one-half hour for one credit (173) or one full hour for two credits (174) of individual instruction for the student to develop proficiency on one of the lower brass instruments: baritone/euphonium or tuba. Playing techniques; fingerings and their alternates; tone quality; embouchure; and a variety of appropriate literature for the instrument will be presented. *Semester course, one or two hours.*

MUSI 175-176. PRIVATE BASSOON LESSON. This course consists of one-half hour for one credit (175) or one full hour for two credits (176) of individual instruction on the bassoon. The student will become familiar with fingerings, embouchure, reed making, and bassoon literature. *Semester course, one or two hours.*

MUSI 177-178. PRIVATE CLARINET LESSON. This course consists of one-half hour for one credit (177) or one full hour for two credits (178) of individual instruction on the clarinet. The student will gain mastery of the basic techniques of performance including literature, intonation, hand position, articulation, fingerings, and embouchure. *Semester course, one or two hours.*

MUSI 179-180. PRIVATE OBOE/ENGLISH HORN LESSON. This course consists of one-half hour for one credit (179) or one full hour for two credits (180) of individual instruction on the oboe or English horn. The student will become familiar with fingerings, embouchure, reed making and literature. *Semester course, one or two hours.*

MUSI 181-182. PRIVATE PERCUSSION LESSON. This course consists of one-half hour for one credit (181) or one full hour for two credits (182) of individual instruction on all of the percussion instruments. The course teaches playing techniques, fundamentals of each instrument, and literature. *Semester course, one or two hours.*

MUSI 183-184. PRIVATE FLUTE LESSON. This course consists of one-half hour for one credit (183) or one full hour for two credits (184) of individual instruction for the student who is interested in developing knowledge of flute literature; technique; tone quality and vibrato; fingerings; and embouchure. *Semester course, one or two hours.*

MUSI 185-186. PRIVATE GUITAR LESSON. This course consists of one-half hour for one credit (185) or one full hour for two credits (186) of individual instruction for the student wishing to concentrate on techniques and fundamentals of guitar playing. Instruction is given on chords, harmonic structure, scales, and literature. *Semester course, one or two hours.*

MUSI 187-188. PRIVATE HARP LESSON. This course consists of one-half hour for one credit (187) or one full hour for two credits (188) of individual instruction at the harp. Must have prior harp or piano experience. *Semester course, one or two hours.*

MUSI 189-190. PRIVATE STRING LESSON - BASS. This course consists of one-half hour for one credit (189) or one full hour for two credits (190) of individual instruction on the string bass. Students will improve technical skill as well as become familiar with string literature for the bass. *Semester course, one or two hours.*

MUSI 191-192. PRIVATE SAXOPHONE LESSON. This course consists of one-half hour for one credit (191) or one full hour for two credits (192) of individual instruction on the saxophone. The student will gain mastery of the basic techniques of performance including literature, intonation, hand position, articulation, fingerings, and embouchure. *Semester course, one or two hours.*

MUSI 193-194. PRIVATE COMPOSITION LESSON. This course consists of one-half hour for one credit (193) or one full hour for two credits (194) of individual instruction on musical composition. This course teaches techniques for writing for instrumental and vocal ensembles, solo works, and small ensembles. *Semester course, one or two hours.*

MUSI 195-196. PRIVATE CONDUCTING LESSON. This course consists of one-half hour for one credit (195) or one full hour for two credits (196) of individual instruction on musical conducting. This course teaches techniques for conducting and rehearsing bands, choirs, or orchestras. *Semester course, one or two hours.*

MUSI 198. MUSIC RECITAL ATTENDANCE FOR MUSIC MINORS. Students fulfill this requirement by attending four recitals each semester they are enrolled as music minors. Students minoring in music must register for this course each semester. *Semester course, zero hours.*

MUSI 199. MUSIC RECITAL ATTENDANCE FOR MUSIC MAJORS. Students fulfill this requirement by attending a predetermined number of faculty, senior and student recitals each semester. Music majors, other than those in Music Education, must register for this course each semester. Music Education majors must register for this course each semester, except for the student teaching semester. The student's academic advisor will monitor compliance with this requirement. *Semester course, zero hours.*

MUSI 203. MUSIC THEORY III. The third in a sequence of four music theory courses. Forms and analysis are covered, including binary form, ternary form, variations, rondo and sonata form. In addition, the elements of chromatic harmony, including harmonic sequences, applied chords, tonicization, modulation, modal mixture, Neapolitan chords, and augmented chords are studied. This course meets the Speaking Intensive (SI) requirement for music majors. Prerequisite: Music 103 and 104. *Semester only, two hours.*

MUSI 204. MUSIC THEORY IV. The fourth in a sequence of four music theory courses. This course covers tonal ambiguity, enharmonic modulation, altered common tone chords, chromatic sequences, intervallic cells, and the division of the octave. Twentieth-century topics and techniques are studied, including impressionism, neo-classicism, quartal harmony, serialism, set theory, minimalism, and electronic techniques. This course meets the Speaking Intensive (SI) requirement for music majors. Prerequisite: Music 203. *Semester only, two hours.*

MUSI 205. AURAL SKILLS III. The third in a sequence of four courses that develop aural recognition through sight singing and dictation. Skill sets include recognition of harmonic and melodic intervals, modes, triads and seventh chords, and harmonic progressions. Prerequisites: Music 105 and 106. *Semester only, two hours.*

MUSI 206. AURAL SKILLS IV. The fourth in a sequence of four courses that develop aural recognition through sight singing and dictation. Skill sets include compound intervals, melodic dictation with modulating melodies, and progressions with seventh chords and secondary harmony. Prerequisite: Music 205. *Semester only, two hours.*

MUSI 207. WOODWIND METHODS. Class instruction in the woodwind instruments with emphasis on the development of the instrumental program in the schools. Prerequisite: Music Major/ Minors only or with the permission of the instructor. *Semester only, one hour.*

MUSI 209 VOCAL METHODS. An overview course aimed at music education and voice performance majors including instruction concerning the mechanics of vocal sound production, vocal

teaching methods, and identifying and correcting vocal faults in the private studio and the choral setting. Prerequisite: Music major and minors only, or with the permission of the instructor.
Semester only, one hour.

MUSI 210. INTRODUCTION TO MUSICAL THEATRE. This class is a survey of the development of musical theatre as a performing art form in America from 1750 to the present. By looking at musical theatre from multiple perspectives--historical, cultural, political, social, aesthetic – the class will explore the ways in which musicals both reflect and embody values and trends of the cultural landscape in which they were written. Included will be practical study of the format of the libretto and musical score in relationship to the major musical theatre genre. Students may only receive credit for one of Music 210 or Theatre 210. *Semester course, three hours.*

MUSI 211. VOCAL DICTION. This course is aimed at music education and voice performance majors and will include instruction concerning the International Phonetic Alphabet; diction rules for singing in Italian, French, German, and English; and the accurate pronunciation of sung Italian, French, English, and German. The course meetings will consist of lecture, audio/video examples, and class participation. *Semester course, three hours.*

MUSI 219. BEGINNING CONDUCTING. A study of the fundamentals of conducting and rehearsal strategies with an emphasis on beginning instrumental and choral techniques. Emphasis is placed on developing baton technique and hand gestures, score study, and developing a comprehensive approach to conducting. *Semester course, one hour.*

MUSI 221. MUSIC TECHNOLOGY. This course provides the student with music notation experience, audio processing experience, background in music industry practices (including music copyright) and provides experience with creating social-media rich websites. This course meets the Information Literacy (IL) requirement for music majors. Prerequisite: Music majors only.
Semester course, two hours.

MUSI 222. MUSICAL THEATRE WORKSHOP. This course is designed to educate students about the musical theatre genre and all of its sub-genres through research, writing, rehearsal, and performance, and to improve their singing, acting, and performance skills. The main focus of class meetings will be rehearsal of assigned scenes according to registered students' abilities. Students will learn at least one musical theatre scene, memorize it, block it, and perform it in a public performance at the end of the semester. *Semester course, two credits.*

MUSI 223. OPERA WORKSHOP. This course will introduce the student to selected scenes from operas. There will be a focus on scene analysis and character development within the context of an operatic role. Class will encourage singers to integrate the vocal and physical connection of theater with language and music. Course may be repeated. *Semester course, two hours*.

MUSI 224. PIANO PEDAGOGY. This course explores aspects of the piano teaching profession, including techniques and methods for various ability levels, repertoire selection, and the business aspects of the career field. *Alternate years, Semester only, one hour.*

MUSI 225. OPERA WORKSHOP. This course will introduce the student to selected scenes from operas. There will be a focus on scene analysis and character development within the context of an operatic role. Class will encourage singers to integrate the vocal and physical connection of theater with language and music. Course may be repeated. *Semester course, one hour.*

MUSI 230. JAZZ HISTORY. A study of the literature and culture of jazz music and jazz musicians of the 20th and 21st centuries. The course discusses the people, history, and compositions of jazz with a focus on the musical characteristics that define early jazz, swing, bebop, fusion, experimental and modern jazz styles. Although a background in music is helpful, it is not required.
Semester course, three hours.

MUSI 260. INDEPENDENT STUDY. Individual study of a specialized topic(s) in music. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

MUSI 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in music. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

MUSI 290. STUDIES IN MUSIC. Intensive examination of an area of music not fully covered by regular departmental offerings. Subject matter varies each semester.
Offered periodically, semester course, one, two, or three hours.

MUSI 302. LITERATURE OF MUSIC. A non-technical survey of the great musical compositions of Western civilization by way of classroom listening. Recommended for non-music majors.
Fall semester only, two hours.

MUSI 303. COUNTERPOINT. A study of the contrapuntal style and practices of Palestrina and other masters of the sixteenth century; compositions of modal counterpoint in two, three and four parts. Prerequisite: Music 203 or 204. *Alternate years, semester course, one hour.*

MUSI 304. ORCHESTRATION. A study of the variety and characteristics of the brass, reed, string and percussion instrument families, progressing from solo instruments through scoring for full band and orchestra. The ability to read music and a basic understanding of music theory is desirable but not required. Prerequisite: Music 204. *Spring semester only, two hours.*

MUSI 307. STRING METHODS. Class instruction in the string instruments of the orchestra; methods of instruction for younger orchestra, with emphasis on the principles of tone production, intonation, bowing, and phrasing. Prerequisite: Music major and minors only, or with the permission of the instructor. *Fall semester only, one hour.*

MUSI 311. KEYBOARD HARMONY. An elective course in harmonic practice at the keyboard. Prerequisite: Music 204. *Alternate years, semester course, one hour.*

MUSI 317. ADVANCED CHORAL CONDUCTING. A course for students desiring further experience in conducting advanced choral material. Prerequisite: Music 219.
Semester course, two hours.

MUSI 318. ADVANCED INSTRUMENTAL CONDUCTING. A course for students desiring further experience in conducting advanced instrumental material. Prerequisite: Music 219.
Spring semester only, two hours.

MUSI 325. CHURCH MUSIC. A historical and theological study of church music, a study of hymns and practical application. *Spring semester only, two hours.*

MUSI 324. LEGAL ASPECTS OF THE MUSIC BUSINESS. This course is designed to analyze the most important legal issues in the contemporary music industry, including how these issues began, how they have evolved, and where they are headed. Students will explore copyright law, including fair use and public domain, and how it affects sampling, interpolation, and mashups. The course will explore contracts related to songwriting, 360° deals, revenue sharing, and more, in addition to legal documents related to bands, booking, and touring. Students will also explore contemporary and new means of creating and disseminating music, including streaming audio/video and augmented/virtual reality, and explore associated legal implications. Students may only receive credit for one of ENTR 324, MNGT 324, or MUSI 324. *Semester course, three hours.*

MUSI 326. INTRODUCTION TO THE BUSINESS OF MUSIC. This course is designed as an introduction to the business of music, providing students with the latest instruction on best practices for music creators, consumers, and facilitators working in this field. Students will have the opportunity

to learn the fundamental principles involved in the entrepreneurial and legal dimensions of the music business, exploring the structural and functional components of this ever-changing and rapidly growing industry. Particular attention will be given to the challenges of starting, growing and managing a music business in the digital era. Students may only receive credit for one of Entrepreneurship 326, Management 326, or Music 326. *Semester course, three hours.*

MUSI 327. PIANO LITERATURE. This course is a study of the literature for the piano, beginning with works of the 17th century intended for harpsichord, and ending with the 20th century works for the modern piano. The course includes a general overview of keyboard music in each historical era, as well as a selective list of works from each era for in-depth study. The historical approach highlights the development of the instrument and the development of compositional styles, performance practices, pianistic idioms, and playing techniques. *Semester course, two hours.*

MUSI 328. WIND LITERATURE. This course has been designed to prepare instrumental music majors to analyze, aurally and visually, the repertoire of the modern-day concert band. Topics to be explored include, but are not limited to, various time periods, genres and geographical influences on concert wind band composition; analysis of compositions for various compositional elements and historical background; and compositional form, instrumentation, pedagogy, and performance practices. *Semester course, two hours.*

MUSI 329. WORLD MUSIC: AFRICA AND THE AMERICAS. This course will study the music, culture, and unique musical traditions resulting from the confluence of African culture and European culture, a result of European colonialism. The course includes various musical/cultural traditions of South America, Latin America, the Caribbean Islands, and North America.
Alternate years, Semester course, three hours.

MUSI 330. WORLD MUSIC: ASIA AND THE MIDDLE EAST. This course will study the musical systems of Asian music, comparing and contrasting the musical/cultural traditions of East Asia, South Asia, Southeast Asia, and Oceania (including, but not limited to, China, Japan, Korea, Thailand, Vietnam, Cambodia, and Indonesia), and the Middle East.
Alternate years, Semester course, three hours.

MUSI 331. MUSIC HISTORY I. A survey of music in Western civilization from ancient Greece to 1750. This course, along with Music 221 and 332, meets the Writing Intensive (WI) and Information Literacy (IL) requirements for music majors. Prerequisite: Humanities 301.
Semester course, three hours.

MUSI 332. MUSIC HISTORY II. A survey of music in Western civilization from 1750 to 1900. This course, along with Music 221 and 331, meets the Writing Intensive (WI) and Information Literacy (IL) requirements for music majors. Prerequisite: Humanities 301. *Semester course, three hours.*

MUSI 333. VOCAL LITERATURE. This course will provide an overview of art songs composed in German, French, Italian, and English from the 17th through 21st centuries. The main objective of this course is to improve students' knowledge of core vocal literature in the art song genre through investigation into composers' lives, works, compositional style, and composers' relationships with poets and poetry. Issues of interpretation and performance practices will also be addressed.
Semester course, t*wo hours.*

MUSI 334. ORCHESTRAL LITERATURE. This course has been designed to prepare instrumental music majors to analyze, aurally and visually, the repertoire of the modern-day symphony orchestra. Topics to be explored include, but are not limited to, various time periods, genres and geographical influences on orchestral composition; analysis of compositions for various compositional elements and historical background; and compositional form, instrumentation, pedagogy, and performance practices. *Semester course, two hours.*

MUSI 335. MUSIC HISTORY III. A survey of music in Western civilization from 1900 to the present. This course, along with Music 331 and 332, meets the Writing Intensive (WI) and Information Literacy (IL) requirements for music majors. Prerequisite: Humanities 301.

Semester course, two hours.

MUSI 360. INDEPENDENT STUDY. Individual study of a specialized topic(s) in music. Junior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MUSI 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in music. Junior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MUSI 376. JUNIOR RECITAL. The junior recital represents a preliminary step toward the senior capstone recital, which is the culmination of study in an area of applied performance. The recitalist demonstrates knowledge of the technique, repertoire, and stylistic interpretation that has been acquired in the applied area during the previous semesters of study. The junior recital is a one-half hour public performance. Prerequisites: Music major with junior standing. *Semester course, one hour.*

MUSI 403. COMPOSITION. An elective course in music composition. This course discusses the fundamentals of music composition in terms of melody, harmony, form, texture and timbre with both an historical perspective (referencing masterpieces from the 12th through 21st centuries) and the opportunity to develop a personal compositional style. The bulk of the course is devoted to work on original student compositions. Prerequisite: Music 204. *Semester course, two hours.*

MUSI 426. MUSIC MARKETING. This course will provide students with an overview of key music marketing principles, terms, and practices, which together form the foundation for all music marketing plans. Students will dig into the key areas of opportunities for musicians, including publicity, advertising, promotion (online and traditional), digital distribution, touring, licensing/synch, and radio. Students will learn what companies and partners to work with to reach their core fans, how to communicate with them, and the ways to leverage the changes and new opportunities that the internet offers to marketers. In addition, they will learn marketing ideas to help them describe their vision, identify a market need, analyze an artist's fan base, learn from their competitors, set marketing plan goals, and find the perfect mix of new marketing strategies ranging from branding, product, price, place, promotion, and marketing information systems. Students may only receive credit for one of Music 426, Marketing 426, or Entrepreneurship 426. Prerequisite: Marketing 204.

Semester course, three hours.

MUSI 460. INDEPENDENT STUDY. Individual study of a specialized topic(s) in music. Senior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MUSI 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in music. Senior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

MUSI 475-476. SENIOR CAPSTONE RECITAL. The senior capstone recital is the culmination of study in an area(s) of applied performance. The recitalist demonstrates knowledge of the technique, repertoire, and stylistic interpretation that has been acquired in the applied area(s) during the previous semesters of study. The senior recital is a public performance. Performance majors will complete a full one-hour recital (MUSI 475) for two credits. Music, Music/Business, Music K-12 Education, and Music/Religion majors will complete a one-half hour recital (MUSI 476) for one credit.

Semester course, one to two hours.

MUSI 480. INTERNSHIP IN MUSIC. This is an opportunity for Music majors to participate in a meaningful learning experience under the supervision of both an employer and department faculty member. Most internships take place during the summer months. *Semester course, one to six hours.*

MUSI 488. SEMINAR IN MUSIC. Available only by permission of the department and the instructor involved. *Semester course, one, two or three hours.*

MUSI 499. HONORS IN MUSIC. A course beyond the regular requirements for the music major. Available only to students with senior status and on an individual basis. *Semester course, one hour.*

MUSIC EDUCATION (MUSE)

MUSE 202. INTRODUCTION TO MUSIC EDUCATION. This course is designed for students majoring in music education. This course is intended to be taken concurrently with Foundations of Teaching (EDUC 202). This course focuses a close lens on the many facets of music education, including the historical and philosophical foundations of music education, special education in the music classroom, curriculum/lesson/unit planning and assessment, as well as the political and social issues facing music educators today. This course requires students to participate in class discussions and to write a formal paper focusing on a topic relevant to the course. Corequisite: Education 202. *Semester course, one hour.*

MUSE 315. MUSIC METHODS FOR ELEMENTARY TEACHERS. A study of music materials and teaching methods designed to prepare the elementary and preschool teacher to engage students in musical learning experiences. Prerequisite: Sophomore standing. *Semester course, one hour.*

MUSE 213. PREK-4 ELEMENTARY MUSIC PEDAGOGY. A study of music methods, pedagogy, materials, and applications for the PreK-4 elementary music teacher. Directed field experience in the PreK-4 schools is required. *Fall semester only, two hours.*

MUSE 214. MIDDLE LEVEL MUSIC PEDAGOGY. A study of music methods, pedagogy, materials, and applications for the middle level (grades 5-8) music teacher. Directed field experience in the middle level schools is required. *Spring semester only, two hours.*

MUSE 313. SECONDARY CHORAL AND GENERAL MUSIC PEDAGOGY. A study of music methods, pedagogy, materials, and applications for the secondary (grades 9-12) general and vocal music teacher. Directed field experience in the secondary choral classroom/school is required. *Fall semester only, two hours.*

MUSE 314. SECONDARY INSTRUMENTAL MUSIC PEDAGOGY. A study of music methods, pedagogy, materials, and applications for the secondary (grades 9-12) instrumental music teacher. Directed field experience in the secondary schools is required. *Spring semester only, two hours.*

MUSE 372. SECONDARY FIELD EXPERIENCE (SECOND LEVEL). An internship course designed to permit K-12 Music majors to engage in an observational and participatory field experience as approved by the instructor. Prerequisite: Music K-12 major. *Semester course, one hour.*

MUSE 373. SECONDARY FIELD EXPERIENCE (THIRD LEVEL). An internship course designed to permit K-12 Music majors to engage in pre-student teaching. Participatory field experience approved by the instructor. Prerequisite: Music K-12 major. *Semester course, one hour.*

MUSE 435. STUDENT TEACHING, ELEMENTARY MUSIC. Senior level Music Education credential candidates student teach in elementary public schools an equivalency of five days per week for seven weeks and attend one practicum session per week. Corequisite: Music Education 437. *One-half semester course, eight hours.*

MUSE 437. STUDENT TEACHING, SECONDARY MUSIC. Senior level Music Education credential candidates student teach at the junior/middle school and/or high school levels in the public secondary schools, an equivalency of five days per week for seven weeks and attend one practicum session per week. Corequisite: Music Education 435. *One-half semester course, eight hours.*

CHARLES JR. and BETTY JOHNSON SCHOOL OF NURSING

Dr. Roach, Chair; Dr. Skees.

Please reference the *Nursing Program Booklet: A Supplement to The College Bulletin* for more detailed program information and requirements.

Course Requirements for Bachelor of Science Degree in Nursing—105 hours

Nursing Core (43 hours):

Nursing 100, 101, 102, 103, 104, 105, 141, 142, 143, and 144.

Nursing BSN Requirements (21 hours):

Nursing 431, 432, 433, 434, 445, 446, 447.

Major Related Requirements (41 hours):

Biology 207; Communication Arts 104; Exercise Science 215, 253, 258, 344; Philosophy 211; Psychology 101, 103, 201; Science 203; Sociology 241; and a one-credit physical fitness (PHYE) elective course.

Courses that count in the Nursing major quality point average (MQPA):

All courses with "NURS" prefixes. A minimum MQPA of 2.00 is required to graduate.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

NURSING (NURS)

NURS 100. INTRODUCTION TO PROFESSIONAL NURSING. Introduction of professional nursing is a course that helps students explore the various aspects of nursing. The purpose of the course is to introduce nursing concepts to nursing majors prior to the admission to the nursing school curriculum. The course focuses on topics such as the historical foundation of the nursing profession, roles and functions of the nurse, education requirements, test-taking strategies, nursing process, ethical issues, cultural sensitivity, and basic nursing competences. *Semester course, two hours.*

NURS 431. COMMUNITY AND PUBLIC HEALTH NURSING. This course focuses on the identification of health problems in terms of a community; beyond the health needs of just one person. The purpose of the course is to introduce public and community health issues and the associated nursing considerations that address the unique concerns of the community as the client. The course topics include health, safety, and nutrition of the community including vulnerable populations and accessibility to healthcare and utilization of resources. Prerequisites: Associate Nursing Degree in Applied Science from Butler County Community College (BC3) and a current unencumbered Registered Nurse (RN) license. *Online, fall semester only, three hours.*

NURS 432. NURSING RESEARCH / EVIDENCE-BASED PRACTICE. This course focuses on the identification of nursing concerns within the clinical environment and the implementation of a strategic plan based upon the evidence that can improve the quality of clinical practice. The purpose of the course is to utilizes the steps of the evidence-based practice model to improve nursing practice. The course topics include the comparison of nursing practice models to EBP models, identification of patient problems, review of the literature, evidence appraisal, planning, implementing, and evaluating for positive outcomes. Prerequisites: Associate Nursing Degree in Applied Science from Butler County Community College (BC3) and a current unencumbered Registered Nurse (RN) license.
Online, fall semester only, three hours.

NURS 433. CRITICAL THINKING IN NURSING. This course focuses on the ongoing development of critical thinking skills within the clinical environment. The purpose of the course is to review how to assess and promote critical thinking in the clinical practice. The course topics include critical thinking, clinical reasoning, clinical judgment, reflection, mindfulness, prioritizing frameworks, professional development, and accountability. Prerequisites: Associate Nursing Degree

in Applied Science from Butler County Community College (BC3) and a current unencumbered Registered Nurse (RN) license. *Online, fall semester only, three hours.*

NURS 434. ADVANCED NURSING ASSESSMENT. This course focuses on the ongoing development of assessment skills based upon the acuity, environment, and patient findings. The purpose of the course is to review how to perform a complete physical assessment based upon presentation of symptoms, physical system(s) involved, health care setting, and patient findings/acuity. The course topics include identifying the purpose of the assessment, types of nursing assessments, head to toe assessment framework, data collection, interpretation or findings, and clinical decision making. Prerequisites: Nursing 431, 432, 433, Associate Nursing Degree in Applied Science from Butler County Community College (BC3) and a current unencumbered Registered Nurse (RN) license. *Online, spring semester only, three hours.*

NURS 445. ADVANCED PHARMACOLOGY FOR NURSES. This course focuses on the enhancement of the knowledge related to pharmacology, safe nursing practice in medication administration, and patient education of pharmacologic therapies. The purpose of the course is to review how pharmacologic therapies are utilized in nursing practice and to promote critical thinking in the health care environment. Prerequisites: Nursing 431, 432, 433, Associate Nursing Degree in Applied Science from Butler County Community College (BC3) and a current unencumbered Registered Nurse (RN) license. *Online, spring semester only, three hours.*

NURS 446. NURSING LEADERSHIP SEMINAR. This course focuses on developing leadership skills that directly impact the clinical care environment and foster positive patient outcomes. The purpose of the course is to introduce both nursing clinical leadership associated with management and leadership that can be developed and implemented at the bedside; both which emphasize the patient and the health care team. Additional topics will include leadership qualities and styles, accountability, self-care, professional development, and management structures. Prerequisites: Nursing 431, 432, 433, 434, 445, Associate Nursing Degree in Applied Science from Butler County Community College (BC3) and a current unencumbered Registered Nurse (RN) license. *Online, spring semester only, three hours.*

NURS 447. NURSING CAPSTONE. This course focuses on the completion of a senior project which is a culmination of liberal arts education at GCC, the Associate of Applied Science Education of BC3, and the initiation into the nursing profession. The purpose of this course is to build on the concepts and knowledge gained from previous nursing courses allowing for the application of theories and concepts associated with nursing leadership, nursing research, and management of care. Prerequisites: Nursing 431, 432, 433, 434, 445, Associate Nursing Degree in Applied Science from Butler County Community College (BC3) and a current unencumbered Registered Nurse (RN) license.
Online, spring semester only, three hours

DEPARTMENT OF PHYSICS

Dr. Wolinski, Chair; Dr. Brower, Dr. Clem, Dr. Marsch, Dr. Wagner.

Course Requirements for Bachelor of Science Degree in Physics—81 hours

Physics Core (32 hours):

Physics 101, 102, 135, 210, 234, 288, 303, 305, 321, 431, and Astronomy 207.

Physics Electives—choose 12 hours from:

Physics 304, 310, 340, 401 or 402, 421, or 442.

Technical Core requirements (26 hours):

Chemistry 105; Computer 141; Mathematics 161, 162, 261, 262, 263; and Physics 242.

Technical Electives (11 hours):

Choose eleven hours from any 300-level Astronomy courses; any Biology courses; Chemistry 112 and 114; any 200- or 300-level Chemistry, Computer Science,

Electrical Engineering, Engineering, or Mechanical Engineering courses; any 300-level Mathematics courses; Physics 260, 270, 360, 370, 470; or any additional courses approved by the Department Chair.

Courses that count in the Physics major quality point average (MQPA):

All courses with "PHYS" and "ASTR" prefixes. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a Bachelor of Science Degree in Physics and Secondary Education Certification—116-118 hours

Physics Core (32 hours):

Physics 101, 102, 135, 210, 234, 288, 303, 305, 321, 431, and Astronomy 207.

Physics Electives—choose 12 hours from:

Physics 304, 310, 340, 401 or 402, 421, or 442.

Technical Core requirements (26 hours):

Chemistry 105; Computer 141; Mathematics 161, 162, 261, 262, 263; and Physics 242.

Technical Electives (6-8 hours):

Choose six to eight hours from Astronomy 310; any Biology courses; Chemistry 112 and 114; Chemistry 345; Computer Science 220, 222, 244, 246, 252, 340, 342, 350; any engineering courses (except Engineering 156, 210, 402 or Electrical Engineering 201, 251); any 300- or 400-level Mathematics courses; Physics 270, 370, 470, 486; or any additional courses approved by the Department Chair. A maximum of three hours from independent research may count toward this requirement.

Education requirements (40 hours):

Education 202*, 203, 204, 215, 317, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Physics and Secondary Education Certification quality point average (MQPA):

All courses with "PHYS" and "ASTR" prefixes. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for a Bachelor of Science Degree in Physics and General Science Secondary Education Certification—97-98 hours

Physics Core (26 hours):

Physics 101, 102, 135, 210, 234, 288, 321, 486, and Astronomy 207.

Technical Core requirements (26-27 hours):

Chemistry 105; Computer 141; Geology 201 or Science 204; Mathematics 161, 162, 261; and Science 202 or Biology 101.

Technical Electives (6 hours):

Choose six hours from any 300-level Astronomy course; Biology 102; Chemistry 112 and 114; any Computer Science course numbered 215 or higher (excluding Computer Science 260, 270, 290, 360, 370, 390, 460, 470, 480, and 488); Mathematics 262; Mechanical Engineering 211, 212, 214; Physics 242, 270, 303, 305, 310, 340, 370, 421, 431, 470; or any additional courses approved by the Department Chair. A maximum of three hours from independent research may count toward this requirement.

Education requirements (40 hours):

Education 202*, 203, 204, 215, 317, 371, 375, 431, 488; Psychology 102; and Special Education 102 and 103. *Note: Students who completed Education 205 while dual enrolled must take Education 206 to complete the Education 202 requirement.

Courses that count in the Physics and General Science Secondary Education Certification major quality point average (MQPA):

All courses with "PHYS", "ASTR", and "EDUC" prefixes; Psychology 102; and Special Education 101. A minimum CQPA of 3.00 and MQPA of 2.75 are required for certification.

Course Requirements for Bachelor of Science Degree in Physics/Computer—87-88 hours

Physics/Computer Core requirements (40 hours):

Physics 101, 102, 135, 234, 242, 288, 303, 321, 442; Astronomy 207; Computer Science 141, 233, 244, and 342.

Technical Core requirements (20 hours):

Chemistry 105; Mathematics 161, 162, 261, 262, and 263.

Hardware or Software Option

Choose one of the following options:

Computer Hardware option (26-27 hours):

Computer Hardware Requirements (20 hours): Electrical Engineering 201, 202, 204, 251, 252, 306, 310, and Computer Science 220.

Technical Electives (6-7 hours): Choose two of the following: Physics 304, 305, 340, 401 or 402, 421, 431; Astronomy 310; or Mathematics 213.

Computer Software option (22-23 hours):

Computer Software Requirements (25-27 hours): Computer Science 220, 222, 325, 340, 350; Physics 210; and two of Electrical Engineering 204; Computer Science 480 or Physics 270, 370, 470 (limit 3 hours); Computer Science 314 or any 400-level computer course; or Mathematics 213 or 222*.

Technical Electives (3 hours): Choose one of the following: Physics 304, 305, 340, 421, 431, or Astronomy 310.

** Students who elect Mathematics 213 and 222 will also receive a minor in Mathematics.*

Courses that count in the Physics/Computer major quality point average (MQPA):

All courses with "PHYS", "ASTR", "COMP", and "ELEE" prefixes, MATH 222. A minimum MQPA of 2.00 is required to graduate.

Course Requirements for a minor in Physics (18 hours)

A minor in Physics will consist of Physics 101, 102, 135, 234, and six hours from Physics 303, 305, 310, 431 or 442 (Electrical Engineering majors may not take Physics 305).

Course Requirements for a minor in Astronomy (21 hours)

A minor in Astronomy will consist of Physics 101 or 121; Physics 102 or 122; and Astronomy 206, 207, 301, and 310.

Course Requirements for a minor in Medical Physics (19 hours)

A minor in Medical Physics will consist of Physics 101 or 121; Physics 102 or 122; and Physics 234, 321, 401, and 402.

Training in both oral and written communication skills is an oft-neglected part of the undergraduate science curriculum. At the same time, communicating one's ideas and results in a clear and coherent manner is an essential skill for a scientist, requiring clarity of thought and expression. In addition, a scientist must know how to find, analyze, and use information developed by others in their field. To address these concerns, all physics majors are required to take Physics 288 as a Writing Intensive (WI) course and Physics 321 as a Speaking Intensive (SI) and Information Literacy (IL) course. In tandem, these courses provide focused, discipline specific training in the areas of oral and written communications as well as the ability to gather, analyze and use information within the field of physics.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

PHYSICS (PHYS)

PHYS 101. GENERAL PHYSICS I-ENGINEERING. A calculus-based study of mechanics including kinematics, Newton's laws of motion, work, energy, linear momentum, rotational motion, angular momentum, gravity, equilibrium, fluids, oscillations, traveling and standing waves. Three lectures and one lab per week. Students may not receive credit for both Physics 101 and 121. Corequisite: Mathematics 161. *Semester course, four hours.*

PHYS 102. GENERAL PHYSICS II – ENGINEERING. A survey of the fundamental principles of electric fields and potentials, circuit theory, magnetism, Maxwell's equations, light, interference, and diffraction. Three lectures and one lab per week. Prerequisite: Physics 101. Corequisite: Mathematics 162. *Semester course, four hours.*

PHYS 121. COLLEGE PHYSICS I. A study of mechanics at the pre-calculus level with applications to the life sciences. Topics include kinematics, Newton's laws, work, energy, momentum, angular motion, fluids, oscillations, and gravity. Three lectures and one lab per week. Students may not receive credit for both Physics 101 and 121. *Fall semester only, four hours.*

PHYS 122. COLLEGE PHYSICS II. A study of electricity, magnetism, geometric and physical physics at the pre-calculus level with applications to the life sciences. Topics include electric field and potential, DC circuits, magnetism, induction, geometric and physical optics, relativity, and nuclear physics. Three lectures and one lab per week. Prerequisite: Physics 121.
Spring semester only, four hours.

PHYS 135. HORIZONS IN PHYSICS. Discussion of current topics in physics. Since scientific journals will provide much of the content for this course, students will learn how to acquire and interpret articles from scholarly publications. In addition, students will be required to attend presentations by physicists actively engaged in research, as well as field trips to academic and industrial laboratories in the area. This course is open to all students but, in the event that the class becomes full, preference is given to physics majors. *Fall semester only, one hour.*

PHYS 210. ELECTRONICS. An introduction to electronics emphasizing those topics most useful to the experimental physicist. As such, the physics of active and passive devices (resistors, capacitors, inductors, diodes, transistors, sensors, etc.) will be discussed along with practical circuit applications (filters, operational amplifiers, voltage regulators, oscillators, timers, etc.). The bulk of this course is devoted to analog electronics, but digital electronics is discussed briefly at the end of the semester. Three hours of lecture and three hours of lab per week. Prerequisite: Physics 102.
Fall semester only, four hours.

PHYS 234. MODERN PHYSICS. An introduction to modern physics. Two essential areas will be covered: the special theory of relativity and the origins of quantum mechanics. Prerequisite: Physics 102; or Physics 122 and Mathematics 162. *Spring semester only, three hours*
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PHYS 242. INTRODUCTION TO THEORETICAL PHYSICS. An introduction to problem-solving techniques used to describe physical phenomena. Includes topics from complex analysis, probability theory, vector calculus, Fourier series and transforms, matrix algebra, differential equations (ordinary and partial), and special functions. Prerequisites: Mathematics 261 and Physics 102, or by permission. *Spring semester only, three hours.*

PHYS 260. INDEPENDENT STUDY. Individual study of specialized topics in physics. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

PHYS 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in physics. Freshman or sophomore standing, permission of the department, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHYS 288. INTERMEDIATE LABORATORY. This course is designed to teach students the *process* of scientific investigation, transitioning them from introductory, cook-book labs to actual experimental design and execution. Experiments cover a variety of topics from classical and modern physics including propagation of error, waves, thermodynamics, optics, spectrophotometry, speed of light, and the photoelectric effect. This course is designed to fulfill the requirements for a Writing Intensive (WI) course in the physics major. *Spring semester only, two hours.*

PHYS 303. MECHANICS I. The application of mathematical methods to the study of the general motion of particles; Newtonian and Lagrangian mechanics; Hamilton's equations; and selected applications. Prerequisites: Physics 101 and either Math 262 or Physics 242, or consent of instructor.
Fall semester only, three hours.

PHYS 304. MECHANICS II. A continuation of Mechanics I. Topics covered include dynamics of a system of particles, motion in a non-inertial reference frame, dynamics of rigid bodies, and coupled oscillations and waves. Prerequisite: Physics 303. *Alternate years, spring semester only, three hours.*

PHYS 305. ELECTRICITY AND MAGNETISM. A study of the fundamental principles of electricity and magnetism. Topics covered include vector calculus, electric field and potential, polarization, electric displacement, linear dielectrics, magnetostatics, and electrodynamics. Prerequisites: Physics 102 and Physics 242 or Mathematics 262. *Fall semester only, three hours.*

PHYS 310. OPTICS. A study of electromagnetic waves. Topics covered include the Maxwell equations, geometric optics, interference, diffraction, polarization, coherence, holography, and topics from nonlinear optics. Prerequisites: Physics 305 or Electrical Engineering 304.
Spring semester only, three hours.

PHYS 321. RADIATION LABORATORY. An experimental study of the detection and characteristics of alpha, beta, gamma, and neutron radiation. One lecture and one lab per week. Physics 321 is designed to fulfill the requirements for a Speaking Intensive (SI) and Information Literacy (IL) course in the Physics major. Prerequisite: 234 or consent of the department.
Spring semester only, two hours.

PHYS 340. THERMODYNAMICS AND STATISTICAL MECHANICS. A study of thermodynamics and statistical mechanics that includes topics such as heat and work; ideal gases; equipartition of energy, entropy, Boltzmann, Fermi-Dirac, and Bose-Einstein distributions; and applications to heat engines, refrigeration, chemical equilibrium, phase transitions, blackbody radiation, and properties of solids. Prerequisites: Physics 234, and 242, or permission of the instructor.
Fall semester only, three hours.

PHYS 360. INDEPENDENT STUDY. An opportunity for independent study of specialized topics in physics. Junior standing, permission of the department, and a faculty sponsor are required. *Semester course, one, two, or three hours.*

PHYS 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in physics. Junior standing, permission of the department, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PHYS 390. STUDIES IN PHYSICS. Examination of different areas in the field of physics not offered by regular course work. Subject matter varies each semester. *Semester course, three hours*.

PHYS 401. RADIATION AND HEALTH PHYSICS. A study of radiation therapy principles in medicine. Topics include how radiation is generated and how it interacts with human tissue, dose limits and how they are calculated, radiation safety, and electron and proton beam therapy. Prerequisite: Physics 234 or permission of instructor. *Alternate years, spring semester only, three hours.*

PHYS 402. MEDICAL IMAGING AND DIAGNOSTIC PHYSICS. This course serves as an introduction to x-ray radiography and advanced diagnostic medical imaging techniques like x-ray tomography (CAT), ultrasound, magnetic resonance imaging, and positron emission tomography. Prerequisite: Physics 234 or permission of instructor. *Alternate years, spring semester only, three hours.*

PHYS 421. ADVANCED TOPICS. An in-depth course in an advanced physics topic (or topics) chosen by the instructor. Content can vary from year to year but may be include areas such as general relativity, nuclear physics, elementary particle physics, solid-state physics, nanotechnology, etc. Prerequisites: Physics 234; and Mathematics 262 or Physics 242. *Fall semester only, three hours.*

PHYS 431. QUANTUM MECHANICS. A study of wave-particle duality, the Bohr atom, and the development of quantum mechanics and its application to the periodic table and the nucleus and solving the Schrödinger equation for several 1D systems and for the Bohr atom. Prerequisites: Physics 234, 303, and Mathematics 262 or Physics 242. *Spring semester only, three hours.*

PHYS 442. COMPUTATIONAL METHODS IN PHYSICS. An advanced course in the solution of physics problems using computer programming and numerical techniques for ordinary differential equations, partial differential equations, algebraic equations, spectral analysis, optimization, and numerical integration. Corequisites: Computer 141; Physics 303; and Mathematics 262 or Physics 242. *Alternate years, spring semester only, three hours.*

PHYS 460. INDEPENDENT STUDY. An opportunity for independent study of specialized topics in physics. Senior standing, permission of the department, and a faculty sponsor are required. *Semester course, one, two, or three hours.*

PHYS 470. PHYSICS RESEARCH. An opportunity to conduct supervised research in physics. Senior standing, permission of the department, and a faculty sponsor are required. *Semester course, one, two, or three hours.*

PHYS 480. INTERNSHIP IN PHYSICS. Selected students participate in individual field experiences under the supervision of an on-site manager and a department faculty member. Requirements include evaluation by the on-site manager, a journal of the internship experience, a final written paper, and an oral presentation describing the completed work. Prerequisite: Permission of the faculty sponsor and coordination with the internship site. *Semester course, one to six hours.*

PHYS 486. PHYSICS EDUCATION SEMINAR. This seminar assists students in their understanding of the basic principles of physics and helps them to learn teaching methods unique to physics. Students will discuss modern research-based educational approaches in physics and assist in instructing the Science 201 class. Prerequisite: Physics education majors only, or permission of the instructor. *Semester course, three hours.*

PHYS 488. SEMINAR IN PHYSICS. An opportunity for a student to undertake a project in an area of physics of special interest. Project approval and amount of credit to be given requires consent of the department. *Semester course, one, two or three hours.*

PHYS 499. HONORS IN PHYSICS RESEARCH. Seniors who have shown special aptitude in physics may, with the consent of the Department of Physics, undertake supervised physics research. A research paper and a formal presentation are required to receive Honors credit. Not to exceed two hours each semester. *Semester course, one or two hours.*

ASTRONOMY (ASTR)

ASTR 206. INTRODUCTION TO SKY MOTIONS AND PLANETS. An introduction to modern astronomy with an emphasis on the motions of the sun, moon, and stars in the sky; the solar system; and extrasolar planets. Includes observations with the campus observatory and an observational project. Open to all students. *Fall semester only, three hours.*

ASTR 207. INTRODUCTION TO STARS, GALAXIES, AND COSMOLOGY. An introduction to modern astronomy with an emphasis on the nature of the universe and objects within it. Topics include the properties of stars, the stellar life cycle, galaxies, and cosmology. Includes an observational project. Open to all students. *Spring semester only, three hours.*

ASTR 260. INDEPENDENT STUDY. Individual study of specialized topics in astronomy. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ASTR 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in astronomy. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ASTR 301. OBSERVATIONAL ASTRONOMY. Methods employed in modern optical observational astronomy. Topics covered include spherical trigonometry, time and coordinate systems, astronomical instruments, photometry, and spectroscopy. Students make extensive use of the campus observatory and the Grove City College observatory near Edinboro, Pennsylvania. Prerequisites: Astronomy 206 and 207. *Alternate years, fall semester only, four hours.*

ASTR 310. INTRODUCTION TO ASTROPHYSICS. A calculus-based introduction to modern astrophysics. Topics covered include orbital mechanics, light and matter interactions, stellar atmospheres, stellar interiors, stellar evolution, the interstellar medium, the Milky Way, other galaxies, and cosmology. Prerequisites: Astronomy 206 and 207; Mathematics 161; Physics 101 or 121; and Physics 102 or 122. *Alternate years, fall semester only, three hours.*

ASTR 360. INDEPENDENT STUDY. Individual study of specialized topics in astronomy. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ASTR 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in astronomy. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ASTR 460. INDEPENDENT STUDY. Individual study of specialized topics in astronomy. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

ASTR 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in astronomy. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

DEPARTMENT OF POLITICAL SCIENCE

Dr. Coulter, Chair; Dr. Kengor, Dr. Stanton, Dr. Verbois. Additional Instructional Faculty: Dr. Berry.

Course Requirements for Bachelor of Arts Degree in Political Science—43 hours

Core Requirements (19 hours):

Political Science 101, 104, 201, 204, 205, and 277.

Political Science Clusters (12 hours):

Choose two courses from two of the following clusters for a total of 12 hours:

American Politics:

Political Science 304, 305, 306, 308, 309, 317, 318, or 319.

Comparative/International Relations:

Political Science 302, 303, 310, 311, 333, 335, 341, 342, or 344.

Political Theory:

Political Science 350, 351, 354, 355, 356, or 357.

Political Science Electives (12 hours):

Choose twelve additional hours of 300-400 level Political Science electives. Note: Completion of Political Science 481 (12 credits) will not fulfill the Political Science Electives in full as only six credits of internship may apply toward the major requirements. The remaining six credits will count as general elective hours.

Courses that count in the Political Science major quality point average (MQPA):

All courses with "POLS" prefix. A minimum MQPA of 2.00 is required to graduate.

Effective communication and research skills are indispensable for career advancement in the variety of fields available to Political Science majors, including law, government at all levels, and business. Thus, the Political Science Department has incorporated Information Literacy (IL), Speaking Intensive (SI), and Writing Intensive (WI) instruction in Political Science 277.

Recommended electives:

Students planning to do graduate work in Political Science are encouraged to acquire backgrounds in mathematics and statistics. Courses in computer literacy are also recommended. All Ph.D. programs require competency in at least two foreign languages as well. Students pursuing law school are advised to take Accounting courses, *Business Law*, *Constitutional Law*, and *Symbolic Logic*. A broad background in the social sciences, history, and the humanities is also recommended.

Course Requirements for a minor in Political Science (18 hours)

A minor in Political Science will consist of Political Science 104, 201, 204, 205, and six hours of Political Science electives.

Course Requirements for a minor in National Security Studies (18 hours)

A minor in National Security Studies will consist of Political Science 302, 303, 335, History 336; and six hours from Political Science 310, 341, 342, 344, History 337, 338, or 375.

Course Requirements for a minor in Pre-Law (18 hours)

A minor in Pre-Law will consist of Political Science 317, 318 (or History 317, 318); Political Science 351 or Philosophy 340; Philosophy 211; and six hours from Accounting

201; Communication Arts 104; Management 303, 304, 308; Philosophy 201; Political Science 305, 308; Sociology 233, 331.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

POLITICAL SCIENCE (POLS)

POLS 101. FOUNDATIONS OF POLITICAL SCIENCE. A review of the principal methods of studying politics, the enduring issues of politics, and main institutions of selected governments in the world today. *Semester course, three hours.*

POLS 104. INTERNATIONAL POLITICS. An analysis of the growth of national states and the factors that determine their behavior in international affairs. Particular attention is given to problems of collective security, balance of power, foreign policy, and political economy.
Semester course, three hours.

POLS 111. UNDERSTANDING THE U.S. CONSTITUTION. A study of the origins and formation of the US Constitution and essential Constitutional features, such as federalism and separation of powers. Attention will be given to the rights and responsibilities of citizens in the U.S. constitutional order. *Spring semester only, one hour*.

POLS 201. COMPARATIVE POLITICS. A selective study of major governments of the industrialized and non-industrialized world. Emphasis placed on the tools of comparative analysis and their application to various nations in the developed and developing world.
Fall semester only, three hours.

POLS 204. AMERICAN NATIONAL GOVERNMENT. A survey of national political institutions including Congress, the Supreme Court, the presidency, public bureaucracy, and a review of selected topics in public policy. *Semester course, three hours.*

POLS 205. POLITICAL PHILOSOPHY AND THE CHRISTIAN INTELLECTUAL TRADITION. This course introduces students to the study of political philosophy through an examination of selected works of political philosophers, theologians, and political actors as those works consider the intersection of theology and political life. *Semester course, three hours.*

POLS 260. INDEPENDENT STUDY. Individual study of specialized topics in political science. Sophomore standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

POLS 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in political science. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

POLS 277. RESEARCH METHODS IN POLITICAL SCIENCE. An introduction to approaches and methods of political science research, with an emphasis on research design, data collection, interpretation, and the use of computers in the discipline. This course is taught with a lab. This course fulfills the Writing Intensive (WI), Information Literacy (IL), and Speaking Intensive (SI) requirements for the Political Science major. *Semester course, four hours.*

POLS 302. NATIONAL SECURITY. A review of American national security policy including coverage of defense policy, military deployments, and threat assessments.
Alternate years, spring semester only, three hours.

POLS 303. GREAT POWER POLITICS. An examination of Great Power Politics with an emphasis on twentieth century developments. The course covers the sources of national strength, relations of

great powers to one another and minor powers, the rise and decline of nations, and the end of the Cold War. *Offered periodically, semester course, three hours.*

POLS 304. THE AMERICAN PRESIDENCY. A study of the major functions of the Presidency, with an emphasis on the Office's historical development and its role in American national government. *Fall semester only, three hours.*

POLS 305. AMERICAN CONGRESS. An examination of the major functions and processes of Congress, with an emphasis on presidential-congressional relationships and the formation of public policy. *Offered periodically, semester course, three hours.*

POLS 306. POLITICAL PARTIES, INTEREST GROUPS, AND ELECTIONS. An overview of the functions of American political parties with special attention to the role of interest groups in the policy process. *Offered periodically, semester course, three hours.*

POLS 308. PUBLIC POLICY. A study of the main issues surrounding current topics in public policy, dealing with welfare and poverty, energy, environment, labor, business, agriculture, consumer policies, and selected issues in foreign policy. Variable credit in election years.
Offered periodically, semester course, three hours.

POLS 309. STATE AND LOCAL POLITICS. An examination of state and local governments and public policies. Topics include federalism, state constitutions, governors, legislatures, judiciary, politics of local governments, and policy debates surrounding local concerns as well as unfunded mandates and meeting federal guidelines. *Offered periodically, semester course, three hours.*

POLS 310. U.S. FOREIGN POLICY. This course offers a general introduction to the traditions and theories of the U.S. foreign policy. The course will cover the traditions and theories of U.S. foreign policy; processes of policy formulation; and the roles of the President, Congress, the State Department, and other government agencies. *Semester course, three hours.*

POLS 311. HUMAN RIGHTS. This course is a study of the ideological and theological foundations of human rights and the roles of states, international organizations, and non-governmental organizations in creating and managing human rights regimes. *Semester course, three hours.*

POLS 317. CONSTITUTIONAL LAW OF THE UNITED STATES I. A study of the development of the United States Constitution through use of the case study method. This course especially focuses on the constitutional powers of the three branches of government, the relationship between state and federal governmental powers, and property rights and economic liberties. Students may not receive credit for both Political Science 317 and History 317. *Fall semester only, three hours.*

POLS 318. CONSTITUTIONAL LAW OF THE UNITED STATES II. A study of the development of the United States Constitution through the use of the case study method. This course especially focuses on the idea of equality and the equal protection clause, due process, privacy and liberty rights, freedom of speech, press and religion and other Bill of Rights issues. Students may not receive credit for both Political Science 318 and History 318. *Spring semester only, three hours.*

POLS 319. PUBLIC ADMINISTRATION. A study of the development, operation, and politics of administrative agencies and the public bureaucracy. *Semester course, three hours.*

POLS 333. MAJOR EUROPEAN GOVERNMENTS. A comparative study of European politics with special emphasis on the major governments of Western Europe and the emerging republics of the former Soviet Union. Problems of European integration and the development of democracy in Eastern Europe are stressed. *Offered periodically, semester course, three hours.*

POLS 335. TERRORISM AND COUNTER-TERRORISM. A survey of terrorism from ancient times to the present with an emphasis on current international groups like al Qaeda, Hezbollah and Hamas, as well as domestic terrorist groups like the Aryan Nations and Ku Klux Klan.
Offered periodically, three semester hours.

POLS 341. AFRICAN POLITICS. A comparative overview of the politics of major African states, with emphases upon the influences of the colonial past, problems of political development, relations with the major powers, the geo-strategic importance of selected countries.
Alternate years, fall semester only, three hours.

POLS 342. MIDDLE EASTERN POLITICS. A survey of major powers of the Middle East with emphases on problems of the colonial past, political development, tribal and religious influences, regional conflicts, and global strategic significance. *Alternate years, fall semester only, three hours.*

POLS 344. ASIAN POLITICS. A study of the major powers of Asia, with special reference to China, Japan and Korea, stressing problems of political and economic development, along with regional conflicts. *Alternate years, spring semester only, three hours.*

POLS 350. AMERICAN POLITICAL THOUGHT. A survey of the foundations of American civilization from the origins of the republic to the present time. Special attention is given to current debates surrounding culture wars and their impact on public policy.
Offered periodically, semester course, three hours.

POLS 351. PHILOSOPHY OF LAW. This course commonly examines such topics as the nature of law, the relationship of law to morality, the problem of judicial interpretation, justice, and rights.
Alternate years, semester course, three hours.

POLS 354. MARXISM. A study of Marxism from its beginnings to its development into twentieth century totalitarianism by Lenin and his successors.
Offered periodically, semester course, three hours.

POLS 355. CLASSICAL POLITICAL THOUGHT. A study of the principle theorists and schools of thought about politics from the Pre-Socratics through the Middle Ages.
Fall semester only, three hours.

POLS 356. MODERN POLITICAL THOUGHT. A survey of the main political thinkers from Machiavelli to the present. The contributions of political theorists to the development of civilization are stressed. *Spring semester only, three hours.*

POLS 357. POLITICAL IDEOLOGIES. A survey of modern ideologies including treatments of liberalism, conservatism, fascism, communism, democratic socialism, and Third World ideologies. Feminism, environmentalism, and related modern ideologies are also covered.
Offered periodically, semester course, three hours.

POLS 360. INDEPENDENT STUDY. Directed research on an individual basis. Junior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

POLS 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in political science. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

POLS 390. STUDIES IN POLITICS. A focused study of selected topics in politics and political science, the content of which varies each semester. *Semester course, three hours.*

POLS 460. INDEPENDENT STUDY. Directed research on an individual basis. Senior standing, permission of the department chair, and a faculty sponsor are required.
Semester course, one, two or three hours.

POLS 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in political science. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

POLS 480. INTERNSHIP IN POLITICAL SCIENCE. This course offers practical experience in the field of politics and political science. *Semester course, one to six hours.*

POLS 481. WASHINGTON INTERNSHIP. This program allows students to spend a semester in Washington working in a government office or for a private organization that deals regularly with public policy matters. For more information, see the "Washington Internship Program" section under General Education and Degree Programs. *Semester course, twelve hours.*

POLS 488. SEMINAR IN POLITICAL SCIENCE. Special topics in political science, the content of which varies each semester. Open to majors and non-majors with department approval.
Semester course, three hours.

POLS 499. HONORS IN POLITICAL SCIENCE. Open only to qualified majors with department approval. *Semester course, one, two or three hours.*

DEPARTMENT OF PSYCHOLOGY AND SOCIAL WORK

Dr. Horton, Chair; Dr. M. E. Bright, Ms. Hollenberger, Dr. K. Homan, Dr. Hosack, Dr. Houk, Dr. Throckmorton, Dr. Welton.

Course Requirements for Bachelor of Arts Degree in Psychology—48 hours

Core Requirements (26 hours):
Psychology 101, 201, 204, 208, 301, 310, 316, and 404.

Psychology Clusters (18 hours):
Choose two courses from each of the following clusters:
Experimental: Psychology 306, 318, or 401.
Clinical: Psychology 206, 207, or 312.
Developmental: Psychology 209, 211, or 322.

Major-Related Requirements (4 hours):
Biology 101 or Science 202. (If Science 202 is taken, the other science course taken to fulfill the general science requirement cannot be a Biology course or SCIC 204.)

Course Requirements for Bachelor of Science Degree in Psychology—54 hours

Core Requirements (42 hours):
Psychology 101, 201, 204, 208, 301, 310, 316, 318, 319, 401, 404, and nine hours of Psychology electives (excluding Psychology 103).

Major-Related Requirements (12 hours):
Biology 101, 102, and 233.

Courses that count in the Psychology major quality point average (MQPA):
All courses with “PSYC” prefix. A minimum MQPA of 2.00 is required to graduate.

Courses recommended for psychology majors include Philosophy 161 and 201. Students are encouraged to take an internship. No credit in independent study or internship may be counted toward the major requirements. Those students planning to do graduate work in psychology are encouraged to take Psychology 318, 401; Philosophy 161, and 201.

Psychology majors, regardless of whether they pursue graduate studies or enter the work force immediately following graduation, need to be good writers and speakers and need to know how to find, analyze, and use information. To that end, Psychology 204 and 404 are Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) courses, designed to provide the necessary skills for psychology majors to be good producers and consumers of psychological information as well as effective communicators of that knowledge.

Course Requirements for Bachelor of Science Degree in Social Work—53 hours

Core Requirements (50 hours):

Psychology 201, 204; Social Work 101, 205, 264, 280, 302, 305, 310, 342, 364, 382, 410, 420, 421, 425, and 426.

Social Work Electives (3 hours):

One course from Economics 102, Psychology 208, 312, or Sociology 208.

Courses that count in the Social Work major quality point average (MQPA):

All courses with "SOCW" prefix. A minimum MQPA of 2.50 is required by fall of the sophomore year or upon acceptance into the Social Work Program and must be maintained until graduation. Transfer students and students changing their major after the first semester of the sophomore year will be evaluated as part of the application process into the Social Work Program. Students on academic probation will be evaluated after one semester and will be dismissed from the Social Work program if their MQPA remains below a 2.50.

SOCW 410 has been designated as the Writing Intensive (WI), Speaking Intensive (SI), and Information Literacy (IL) course for Social Work majors.

The Social Work Program aims to prepare students for competent and compassionate, entry-level, generalist social work practice within the broader context of a Christian, liberal arts perspective. The Social Work Program has been accredited by the Council of Social Work Education.

Course requirements for a minor in Family Studies (19 hours)

A minor in Family Studies will consist of Psychology 201; Sociology 312; one course from Psychology 204, Political Science 277, or Sociology 377; and three courses from Psychology 209, 211, 322, or Sociology 251.

Course Requirements for a minor in Psychology (18 hours)

A minor in Psychology will consist of 18 hours of Psychology courses, including Psychology 101, and excluding Psychology 102. Exercise Science 203 Exercise and Sport Psychology may also be counted toward the Psychology minor.

Course requirements for a minor in Social Work (21 hours)

A minor in Social Work will consist of Social Work 101, 264, 272, 342, 382, and six hours from Sociology 203, 208, Social Work 205, 280, 305, or Psychology 312.

Students are expected to contact their advisors for a detailed schedule of courses recommended to meet requirements for a major.

PSYCHOLOGY (PSYC)

PSYC 101. FOUNDATIONS OF PSYCHOLOGICAL SCIENCE. This course is designed to introduce the student to the field of psychology, which is defined as the scientific study of behavior and mental processes. Like other sciences, psychology seeks to explain, predict, and control the events it studies. Students will be exposed to the important theories, methods, and landmark findings that have helped to shape psychology as a field of inquiry. An integral focus of the course will be a consideration of how psychology can contribute to the synthesis of a consistent Christian worldview.
Semester course, three hours.

PSYC 102. EDUCATIONAL PSYCHOLOGY. A consideration of those aspects of psychology which form the basis for educational methods and their application in the school curriculum, including student characteristics, group and individual differences, cognitive and personality development, learning theory, measurement, and evaluation. This course satisfies the Information Literacy (IL) requirement for all education majors. *Semester course, three hours.*

PSYC 103. LIFESPAN HUMAN GROWTH & DEVELOPMENT. This course will cover human development across the lifespan-from conception to end of life. Key theories and research in the domains of physical, socio-emotional and cognitive development will be considered. This course is designed to meet the needs of students in nursing and other pre-health majors. **Psychology majors may not receive credit for PSYC 103 toward their major.** *Semester course, three hours.*

PSYC 105. PERSPECTIVES ON PSYCHOLOGY. This course is designed to fulfill the foundations requirement for students who have taken introductory psychology at another institution. The course will focus on the ways in which a Christian worldview impacts the study of psychology. Topics to be covered will complement those topics typically covered in the Foundations of Psychological Science course emphasizing the integration of Christianity and psychology. This course may not be taken by a student who has completed Psychology 101 at Grove City College. Prerequisite: any comparable Psychology 101 class taken at another institution. *Semester course, one hour.*

PSYC 200. CROSS-CULTURAL PSYCHOLOGY. A study of the critical and comparative effects of cultural and international differences on human psychology. Topics will include cultural presuppositions and differences, cognition, emotion, intelligence, testing, motivation, conflict, and mental health, with a particular emphasis on human development, social psychology, and conflict.
Semester course, three hours.

PSYC 201. STATISTICAL METHODS. This course will examine the mathematical reasoning and methodology underlying decision-making in the sciences. Students will develop skills in the analysis and interpretation of data from scientific experiments, enabling them to be informed consumers of the professional literature. Topics will include descriptive statistics, probability theory, and inferential statistics. Students may only receive credit for one of Psychology 201, Management 201, or Mathematics 201. *Semester course, three hours.*

PSYC 202. PSYCHOLOGY OF RELIGION. A psychological approach to the understanding of religious life with special emphasis on the Judeo-Christian tradition. In addition to traditional areas in the psychology of religion (e.g., religious development, measurement of religion and spirituality, forgiveness, religious conversion, religious orientation and attitudes, etc.) the course will consider issues surrounding the integration of psychology and theology, the innateness of spirituality, the nature of the soul or self, the neuroscience of religious experience, and the role of religion and spirituality in health. Prerequisite: Psychology 101. *Semester course, three hours.*

PSYC 204. RESEARCH METHODS. Introduction to laboratory techniques in psychological science. Methods of controlled investigation, use of databases for psychology, evaluation of results using SPSS, and writing reports of experiments using APA format will be emphasized. Three lectures and two hours of lab per week. This course meets the Information Literacy (IL) requirement for the Psychology major. Prerequisites: Psychology 101 or Social Work 101, and Psychology 201.
Spring semester only, four hours.

PSYC 206. INTRODUCTION TO PROFESSIONAL COUNSELING. An introduction to the theories, practices and ethical issues employed in professional counseling. Prerequisites: Psychology 101. *Semester course, three hours.*

PSYC 207. PSYCHOLOGY OF PERSONALITY. A study of the major psychological theories of personality development and their application to applied psychology. Prerequisite: Psychology 101. *Semester course, three hours.*

PSYC 208. SOCIAL PSYCHOLOGY. The scientific study of the way individuals think, feel, and behave under the actual, imagined, or implied presence of others. Our study of social psychology will investigate the relationship between attitudes and behavior, attribution theory, cultural influences, conformity, prejudice, aggression, attraction, altruism, conflict, etc. We will concentrate on applying social psychology to real world experiences and will include in-depth analysis of original literature. *Semester course, three hours.*

PSYC 209. CHILD DEVELOPMENT. This course is a survey of the child development field. Students will be encouraged to develop an appreciation for the value of science for understanding children and their development. Key theories and research regarding cognition, language, attachment, moral reasoning, and the effects of family and peers will be considered. This course is required for all Early Childhood and Elementary Education majors. *Semester course, three hours.*

PSYC 211. ADULT DEVELOPMENT AND AGING. Investigation of the psychological, biological, and social aspects of early, middle, and late adult development emphasizing both the opportunities and limitations of aging. *Semester course, three hours.*

PSYC 214. INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY. The psychology of work and organizations. Introduction to the use and application of psychology in the workplace. Prerequisites: Psychology 101 and 208. *Semester course, three hours.*

PSYC 260. INDEPENDENT STUDY. Individual study of specialized topics in psychology. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PSYC 270. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in psychology. Sophomore standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PSYC 290. STUDIES IN PSYCHOLOGY. This course, which varies each semester, involves the examination of different areas of psychology with a focus on new areas not covered in regular coursework. *Offered periodically, semester course, one, two or three hours.*

PSYC 301. HISTORY AND SYSTEMS OF PSYCHOLOGY. A study of the philosophical and scientific antecedents and trends that have culminated in contemporary psychological science. Beginning in the Classical world and moving through the Middle Ages, Renaissance, and the scientific revolution of the 16th – 18th centuries, this course will trace how psychology emerged as an independent discipline at the end of the 19th century. Significant questions raised by psychology, changing views of the soul or self, and how American culture in the 21st century has become a psychological society will be considered. Primary works of influential philosophers and scientists will be read. Prerequisite: Twelve hours of psychology. *Semester course, three hours.*

PSYC 305. HEALTH PSYCHOLOGY. Health psychology is devoted to understanding psychological influences on how people stay healthy, why they become ill, and how they respond when they do get ill. This course explores the psychological and social factors that lead to the enhancement of health, the prevention and treatment of illness, and the evaluation and modification of health policies that influence health care. Prerequisite: Three hours of psychology coursework, excluding Psychology 201. *Semester course, three hours.*

PSYC 306. SENSATION AND PERCEPTION. This course covers the physiological basis of sensation and the psychological aspects of perception. Vision, audition, the chemical and the cutaneous senses are investigated as are the perception of time, music, speech and pain. Prerequisite: Psychology 101. *Semester course, three hours.*

PSYC 310. PSYCHOLOGICAL ASSESSMENT. This course will include a) an analysis of psychometric principles, including reliability, validity, and standardization; b) an analysis of intelligence, personality, and interest testing, including in-depth investigation of various tests; and c) an analysis of current issues including discrimination in testing. Prerequisites: Psychology 101 and 201. *Semester course, three hours.*

PSYC 312. ABNORMAL PSYCHOLOGY. This course provides an overview of the various psychological disorders, as well as theoretical, clinical, and experimental perspectives of the study of psychopathology. Emphasis is placed on classification, etiology, assessment and treatment of the major disorders. Prerequisites: Psychology 101 and three hours of psychology.

Semester course, three hours.

PSYC 315. FORENSIC PSYCHOLOGY. This course introduces the student to psychological research, principles and practice as applied to the legal system. Emphasis will be placed on the interface between clinical work and the courts, as well as the psychology of the offender. Prerequisite: Psychology 101. *Semester course, three hours.*

PSYC 316. BEHAVIORAL NEUROSCIENCE. A study of the biological bases of behavior. Neuroanatomy and fundamental principles of neurophysiology and neural communication will be covered as will be the physiological mechanisms operating in sensation, emotion, consciousness, ingestive behavior, learning and memory, reinforcement, addiction, and psychiatric disorders such as schizophrenia. Prerequisite: Psychology 101 or permission of the instructor.

Semester course, three hours.

PSYC 318. COGNITIVE PSYCHOLOGY. A study of human mental processes such as memory, reasoning, decision-making, judgment, and social cognition. Included will be a cognitive neuroscience perspective on mental processing and the practical implications of these processes in social evaluation, culture, and public policy. Prerequisites: Psychology 101, 201 and 204. *Semester course, three hours.*

PSYC 319. COGNITIVE PSYCHOLOGY LABORATORY. Using computer simulations of cognitive psychology methods, students will investigate human mental processes such as memory, attention, recognition, decision-making, problem-solving, and social evaluation. Prerequisites: Psychology 101, 201 and 204. *Semester course, one hour.*

PSYC 322. MARRIAGE & FAMILY: ASSESSMENT AND INTERVENTION. The course examines assessment and intervention in marriage and family with an emphasis on marriage. Primary sources examining empirically developed and tested approaches will be considered. The focus will be on scientific understanding rather than the development of counseling skills. Prerequisite: Psychology 101; and Psychology 201, Management 201 or Mathematics 201. *Semester course, three hours.*

PSYC 326. PREPARATION FOR THE MENTAL HEALTH PROFESSIONS. This course will provide an in-depth review of current applications of counseling and psychotherapy tailored for students planning to attend graduate school in mental health delivery or employment post-graduation. Students will review current theories and trends of mental health service delivery in the United States. Principles of professional development will be covered leading to a personal plan of professional development for each student. Students will review current ethical and theoretical issues in counseling and psychotherapy. Prerequisites: Psychology 101, 206, 207. *Semester course, three hours.*

PSYC 360. INDEPENDENT STUDY. Individual study of specialized topics in psychology. Junior standing, permission of the department chair, and a faculty sponsor are required.

Semester course, one, two or three hours.

PSYC 370. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in psychology. Junior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PSYC 390. STUDIES IN PSYCHOLOGY. This course, which varies each semester, involves the examination of different areas of psychology with a focus on new areas not covered in regular coursework. *Offered periodically, semester course, one, two or three hours.*

PSYC 401. ADVANCED STATISTICS. An introduction to multivariate statistics by using computer statistical packages as applied to social science research including such topics as multiple regression, discriminant analysis, factor analysis, multivariate analysis of variance (MANOVA), path analysis, and other frequently used multivariate statistical techniques. Prerequisites: Psychology 101, 201 and 204. *Alternate years, fall semester only, three hours.*

PSYC 404. ADVANCED RESEARCH METHODS. A study of advanced research methods, including an independent research project. An IRB proposal, data collection, and formal written and oral presentation of the study are required. This course meets the Writing Intensive (WI) and Speaking Intensive (SI) requirements for the psychology major. Prerequisites: Psychology 101, 201 and 204. *Semester course, four hours.*

PSYC 460. INDEPENDENT STUDY. Individual study of specialized topics in psychology. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PSYC 470. INDEPENDENT RESEARCH. An opportunity to conduct supervised research in psychology. Senior standing, permission of the department chair, and a faculty sponsor are required. *Semester course, one, two or three hours.*

PSYC 480. INTERNSHIP IN PSYCHOLOGY. An opportunity for upper class psychology majors, with a minimum of fifteen hours in psychology, to participate in individual field experiences in clinical or counseling settings under the professional supervision of the staff of cooperating institutions. Prerequisite: Permission of the department chair. *Semester course, one to six hours.*

PSYC 499. HONORS IN PSYCHOLOGY. Open only to senior psychology majors who have honors grades. Application must be made to the department and a proposal for the study approved before registering. The student studies under the guidance of department staff and must submit evidence of superior achievement. *Semester course, one, two or three hours.*

SOCIAL WORK (SOCW)

SOCW 101. FOUNDATIONS OF SOCIAL WORK. This foundational course introduces students to the rich and diverse discipline of social work and its widespread societal contributions. Students will learn the fundamentals of generalist social work; the ethics, tenets, and history of the profession; as well as an overview of the social welfare system in America. Examination of prominent social work values, philosophical assumptions, and theories occurs throughout the course. Discussions of the diverse populations and settings served by social workers are also discussed. Thoughtfully integrating the core values of social work and Biblical view of human nature is a particular aim of the course. *Semester course, three hours.*

SOCW 205. ADMINISTRATION IN SOCIAL WORK. This course introduces students to conceptualizing social problems through careful problem analysis and the development of effective programmatic responses. Because social service agencies are widely funded through public and private grants, students will also be introduced to the process of grant writing. Emphasis is placed throughout the course on responding to human need through service that demonstrates compassion, competence, and a commitment to promoting human dignity and flourishing. *Fall semester only, three hours.*

SOCW 264. HUMAN BEHAVIOR IN THE SOCIAL ENVIRONMENT I. This course provides a solid understanding of human behavior and development as it is manifested and developed within families, groups, organizations, and communities. The relationships among biological, social, psychological, cultural, and spiritual realities are examined for the ways they impact and inform human behavior. Discussions of human behavior and development will be specifically targeted to forming a solid understanding and foundation for the practice of social work. Prerequisite: Social Work 101. *Spring semester only, three hours.*

SOCW 272. SOCIAL WORK PRACTICUM. This practicum will be structured around a professional field experience of 140 on-site hours completed at a local organization providing quality social services. This experience is a critical component of preparing for a Social Work career. In addition to the field experience, students will attend a weekly, one-hour meeting led by a professor from the department with the purpose of collectively discussing case scenarios as well as interpersonal dynamics with relevance to the development of competent social work practice. Practicum objectives include directly observing how professional social work practice is implemented within a specific setting, integrating an introductory generalist theory with practice, obtaining knowledge about macro social service delivery systems, applying critical thinking skills to specific case situations, and demonstrating increased self-awareness related to interest areas within the field of social work. Prerequisites: Social Work 101, 264, and 382. *Semester course, three hours.*

SOCW 280. INTERNATIONAL SOCIAL DEVELOPMENT. This course, designed both for students of social work and students of any major interested in issues of international social justice, examines the history and development of these problems from micro and macro perspectives, exploring the social, political, and economic dynamics that catalyze and perpetuate unjust practices as well as the everyday experiences of those directly impacted. A social development model will be introduced, as well as case studies and readings from the Global South that encourage students to consider cross-cultural perspectives on the efficacy of social development practices. Not solely a theoretical examination, the course will encourage students to formulate and integrate ideas grounded in knowledge about cross-cultural social work practice, human development, and theology. Prerequisite: Social Work 101 and 264. *Fall semester only, three hours.*

SOCW 302. GENERALIST PRACTICE I. This course introduces the generalist practice model of social work including theoretical frameworks, epistemological foundations, values and ethics, and practice approaches with individuals and families situated in a diverse range of environments. The study of social work functions, knowledge formation, and foundational skills are integral to the course. Additionally, the development of micro-level observation, assessment, interviewing, and clinical analysis utilizing a problem-solving approach is a primary emphasis. Prerequisites: Social Work 101 and 264. *Fall semester only, three hours.*

SOCW 305. CHILD WELFARE. Children represent a group that is critically important to the future, yet also a group without the ability to advocate for themselves. This course will examine child welfare, society's response to providing services for children who lack adequate adult care and nurturing. The history, philosophies, programs, policies, and practices which comprise past and current child welfare services will be examined for both their efficacy and intended and unintended consequences upon some of the most vulnerable persons within our society. Case studies that illustrate the complexities of providing ethical and competent child welfare practice will also be integrated into the course. Prerequisite: Social Work 101. *Spring semester only, three hours.*

SOCW 310. GENERALIST PRACTICE II. This course builds upon the preceding course, Generalist Practice I, by extending the study of social work theory and practice to task and treatment groups and to social service institutions. The course focuses on developing and evaluating the practice skills and interventions that are necessary for facilitating effective change within each of these levels. A section on case management theory and skills, as well as an introduction to motivational interviewing are also included. Special attention will be given to interventions that are particularly geared toward individuals on the margins of society including the poor, disabled, elderly, and other at-risk populations. Prerequisite: Social Work 302. *Spring semester only, three hours.*

SOCW 342. SOCIAL WELFARE POLICY ANALYSIS. This course carefully analyzes and evaluates social welfare policies and programs as responses to defined social problems within their historical, political, and economic contexts. Past and present social welfare policies will be evaluated from a generalist perspective and students will be encouraged to critically analyze policies for both their efficacy and intended and unintended consequences. Policies related to poverty, advocacy, mental health, homelessness, racism, and child welfare will be specifically examined for their relevance to the practice of social work. Prerequisite: Social Work 101. *Fall semester only, three hours.*

SOCW 364. HUMAN BEHAVIOR IN THE SOCIAL ENVIRONMENT II. This course explores the frameworks, values, and skills inherent to meeting micro-level—individual and family—needs through an examination of the "mediating layers of society" of our organizations and communities. The underlying assumption of the course is there is a reciprocal relationship between individuals and families and the larger contexts in which they are situated. Therefore, working for change on any level requires an understanding of the full range of social contexts that both positively and negatively affect groups of people. This course explores the middle context which lies between that of the individual and macro-level social welfare policies. Particular emphasis will be given to exploring ways of intervening in society's middle layers that utilize best practices and promote human flourishing. Prerequisites: Social Work 264. *Spring only semester, three hours.*

SOCW 382. HUMAN DIVERSITY IN SOCIAL WORK PRACTICE. This course highlights the ways in which an understanding of human diversity informs all aspects of social work including practice and policy. Attention to some of the ways humans are diverse including race and socioeconomic status will be carefully examined as they relate to the practice of social work. Case studies will also be utilized to explore ways in which individuals and groups are negatively affected psychologically, economically, and spiritually by biased or unjust systems and structures. Prerequisite: Social Work 101. *Spring semester only, three hours.*

SOCW 410. SOCIAL WORK CAPSTONE. This course requires students to demonstrate integration of the courses in the social work major in a final research project. The project entails research into a specific social work practice or social welfare policy and involves study design, implementation, analysis, and presentation. This course meets the Writing Intensive (WI), Speaking Intensive (SI), Information Literacy (IL) requirements for the social work major. Prerequisites: Social Work 101. *Fall semester only, three hours*.

SOCW 420. FIELD PLACEMENT I. In this course, students are placed in social service organizations under the supervision of social work practitioners who are "teachers" in the field (field instructors) and under the careful guidance of the on-campus faculty. Students do not simply "work" in the setting, but are guided by specific learning outcomes. The goals of the field placement experience are to link the traditional curriculum with experiential learning through the development of a professional self and the development of foundational generalist practice skills with clients and client systems. Prerequisites: Senior status and faculty approval. *Fall semester only, four hours.*

SOCW 421. FIELD PLACEMENT II. In this course, students are placed in social service organizations under the supervision of social work practitioners who are "teachers" in the field (field instructors) and under the careful guidance of the on-campus faculty. Students do not simply "work" in the setting, but are guided by specific learning outcomes. The goals of the field placement experience are to link the traditional curriculum with experiential learning through the development of a professional self and the development of foundational generalist practice skills with clients and client systems. Prerequisites: Social Work 420. *Spring semester only, four hours.*

SOCW 425. FIELD PLACEMENT SEMINAR I. The purpose of the seminar is to collectively discuss case scenarios, as well as interpersonal dynamics with relevance to the development of competent social work practice. Some of the course seminars will also be topical in nature, covering experiential components of social work practice such as confidentiality, boundaries, ethics, integration of faith and practice, and professional self-care. Prerequisites: Senior standing and faculty approval. *Fall semester only, one hour.*

SOCW 426. FIELD PLACEMENT SEMINAR II. The purpose of the seminar is to collectively discuss case scenarios, as well as interpersonal dynamics with relevance to the development of competent social work practice. Some of the course seminars will also be topical in nature, covering experiential components of social work practice such as confidentiality, boundaries, ethics, integration of faith and practice, and professional self-care. Prerequisites: Senior standing and faculty approval. *Spring semester only, one hour.*

SOCW 460. INDEPENDENT STUDY. Opportunity for students to do independent study work in a specialized area of social work. Senior standing, permission of the department chair, and a faculty sponsor are required. S*emester course, one, two or three hours.*