ITEC Course Descriptions

# DATA 1501 Introduction to Data Science

* This course is intended to provide an introduction into the field of Data Science. Students will develop skills in appropriate technology and basic statistical methods by completing hands-on projects focused on real-world data and addresses the social consequences of data analysis and application.
* The GGC version currently focuses on Excel fundamentals, simulation, and some exposure to Python/Pandas. There are many e-Core sections which I know very little about. --Siva

# ITEC 1001 Introduction to Computing

* This course is designed to provide an introduction to basic computing concepts, usages, and essential skills necessary for work and communication in today's workforce. This is accomplished in two ways.
  + The first component of the course is the book content covering ten topics of basic computing: operating systems (Windows and MacOS), file management, internet research, basic programming, computer hardware, networking and the internet, security, mobile devices, and ethics. Students are expected to complete a learning assignment similar to reading the chapter, a quiz, and an assignment applying the knowledge and skills learned from each chapter.
  + The second component of the course is learning four differing types of productivity software: word processing software, spreadsheet software, database management system software, and presentation software. Students will complete simulations, projects, and assessments for each software. A comprehensive midterm and final are given over both the book content and the productivity software.

# ITEC 2110 Digital Media

* Students will learn how many forms of digital media are created, edited, adjusted and published. Projects will apply this knowledge to creating publishable content. Modern media copyright and related legal issues are discussed.

# ITEC 2120 Introduction to Programming

* An introduction to concepts, principles and skills of programming **targeting non-majors**.
* Python3:
  + Fundamentals (data types, logic, conditionals...)
  + Functions (Procedural Programming)
  + Lists
  + File I/O with some data analysis / visualization
  + Overview of the main concepts of Software Engineering
  + No Dictionaries
  + No Object-Oriented Programming

# ITEC 2130 Web Technologies

* In this course, students will learn how to write code to create web pages (not using templates) using HTML, CSS, and JavaScript. The topics covered include page layout design, images, tables, forms, multimedia, animations, responsive layout, web-based drawing and games.
* Students will create web pages in class activities, labs, and projects to practice the knowledge they have learned.

# ITEC 2135 Engineering Graphics and Design

* In this course, students will learn about the engineering design process, learn 2D and 3D techniques in AutoCAD and learn how to read and construct engineering drawings with various techniques.
* This class has a heavy focus on AutoCAD assignments and 2 large projects.
* Students will be required to complete a midterm and a final project.
  + Midterm project: Student will apply their knowledge of the engineering design process to identify and analyze a problem, use the engineering design process to create a solution, and use 2D techniques in AutoCAD to communicate that solution to the end user.
  + Final project: Students will apply their knowledge of 3D techniques in a multi-weeklong project in AutoCAD.

# ITEC 2140 Programming Fundamentals

* This course is for ITEC majors and minors and covers the fundamentals concepts, principles, and skills of programming. Students will understand the coding process, and how to design solutions to real-world problems using classes and objects, conditional expressions, functions, and control structures. They will also learn how to develop, execute, and debug code, and develop in a consistent and readable programming style.
* Programming Language: Java
* The course emphasizes the importance of consistent work throughout the semester via assignments and exams. In order to pass, students must demonstrate, during exams, the programming skills required to succeed in higher level courses.

# ITEC 2150 Intermediate Programming

* This course is for ITEC majors and covers more advanced programming concepts, principles, and skills of programming.
* Much of the course focuses on object-oriented programming (OOP) concepts, such as inheritance, polymorphism, and generic classes. Students will understand these concepts and apply them to design and implement programming solutions. Students will further develop their understanding of the difference between primitive data types (such as int and double) and reference data types for objects.
* Students will understand how to use exception handling to handle error conditions and write robust programming solutions.
* Students will understand the input/output mechanisms and write code to read data from files and write data to files.
* Students will understand the basics of recursion and use recursion to solve problems that are recursive in nature. That is, a problem’s solution can be composed of the solutions to its sub-problems, which in turn use the same approach in synthesizing solutions from their sub-sub-problems.
* Students will develop an understanding of basic data structures (stacks, queues, lists) and be able to choose the most adequate data structure to solve a problem.
* Last, students continue to develop the skills they have acquired in ITEC-2140, such as preparing, executing, and debugging program code within an interactive programming environment and demonstrating a consistent and readable programming style.
* Programming Language: Java
* The course emphasizes the importance of consistent work throughout the semester via assignments and exams. In order to pass, students must demonstrate during exams the programming skills required to succeed in higher-level courses.

# ITEC 2201 Introduction to Information Systems

* A study of the fundamentals of information systems, including what they are and how they affect organizations.
* This course includes:
  + the key concepts of information systems (IS) and information technology (IT)
  + how IS and IT can be applied to gain competitive advantage in business
  + the role and impact of IS/IT on globalization
  + the role of application software in organizing data and demonstrate an ability to use such software
  + demonstrate knowledge web site development using application software
  + the different information systems used to support business functions at an organization
  + the system development life cycle and its role in developing/supporting information systems
  + the importance of project management and demonstrate an ability to use project management software
  + the security, ethics and privacy issues involved along with future emerging trends in technology
* Software Tools: MS Office, MS Access, Project Management

# ITEC 3100 Introduction to Networks

* This introductory course teaches the basics of data communications and networking. Students will understand network architectures, Internet concepts and terminologies, networking hardware (hubs, switch, router, gateway, wireless routers, wireless access points) and software protocols such as TCP/IP. Students will also learn to design their own network using Cisco Packet Tracer and implement basic security concepts and operational essentials.
* Attendance and in-class hands-on activities will be essential to success in this course. Quizzes, Midterm, Project and Certiport Information Technology Specialist Certification exam preparation.

# ITEC 3110 Design Concepts and Techniques for Digital Media

### **Course Description:**

This course teaches design concepts as used in the field of digital media. Students gain an advanced understanding of the design process in digital media production. The course teaches advanced digital media production techniques using industry-standard software. Using the skills and techniques taught students execute their digital media concepts into digital media deliverables. Upon completion of this course students will be able to:

1. Define, demonstrate, build, analyze and adapt digital media assets and projects

2. Apply, analyze and adapt advanced digital media design principles and standards into the production and delivery of digital media

3. Construct digital media projects demonstrating advanced proficiency using industry standard software

4. Apply the concepts found within elements/assets and principles of design

5. Compose digital media projects which model design theories and concepts into digital media

6. Apply, analyze and appraise theory when designing digital media

7. Compose and create a brand identity

8. Identify, distinguish and apply the differences between visual UX, UI, graphic and web design

# ITEC 3130 Web Programming and Design

* In this course, students will learn client-side web programming techniques using JavaScript. Course content covers basic data and control structures such as variables, arrays, conditionals, loops, functions, and objects.
* Students will work on class activities, homework, and projects to practice the knowledge they have learned.

# ITEC 3150 Advanced Programming

* This course is for ITEC majors and continues coverage of more advanced programming concepts, principles, and skills of programming.
* Much of the course focuses on binary IO, memory management, time complexity, UI design and coding, multithreaded programming, and data structure selection and algorithm selection. Students will understand these concepts and apply them to design and implement programming solutions.
* Students will practice how to test and debug solutions.
* Last, students continue to develop the skills they have acquired in ITEC-2140 and ITEC -2150, such as preparing, executing, and debugging program code within an interactive programming environment and demonstrating a consistent and readable programming style.
* Programming Language: Java, JavaFX
* The course emphasizes the importance of consistent work throughout the semester via assignments and exams. In order to pass, students must demonstrate during exams the programming skills required to succeed in a production coding environment.

# ITEC 3200 Introduction to Databases

This is an introductory course to databases with a focus on relational databases. The course is divided into four major areas consisting of relational databases, SQL, database modeling, normalization and database design. Students will install the database management system software MySql or a similar database management system software and learn how to create tables and relate tables. Students will learn how to write basic and intermediate SQL commands such as SQL operators, built-in-functions, Group-Bys, basic sub-queries and joins. Students will use a modeling tool such as MySQL Workbench or MS Visio to build entity relationship diagrams. Students will learn how to implement the E.R model to a database. The course consists of class assignments, homework, quizzes and exams. Students work on a semester long database project to design, model and implement a database for a business case of their choice.

# ITEC 3300 Information Security

This course covers the fundamental concepts of information security and its importance in today’s era. The course covers almost all the aspects of information security from network security to web and mobile application security concepts. Topics include: Networking fundamentals, Malware structure and its types, Authentication, Access control methods, Cryptography, Network security attacks, Web and Mobile application vulnerabilities and defense strategies etc. Besides all these theoretical concepts, the students will also use several security tools such as NMAP, Wireshark, Sqlmap, BeEF, SNORT, Honeypots and many other ethical hacking tools to get a hands-on experience with the current information security platforms and frameworks. Additionally, the students will also learn Bash and Batch scripting languages which will assist them in getting their course project done.

# ITEC 3350 Digital Commerce

This course covers basic business practices using electronic commerce. Upon completion of this course, students will: (1) Understand the key concepts of e-commerce (2) Understand various e-commerce business models (3) Understand current business issues in e-commerce (4) Understand the technology infrastructure for e-commerce (5) Understand the security issues related to e-commerce (6) Understand different types of payment systems used in e-commerce (7) Understand the online marketing communications in e-commerce (8)Demonstrate proficiency in developing a business report on the Web using HTML (9) Analyze and evaluate an e-commerce business (10) Plan an e-commerce business.

# ITEC 3450 Computer Graphics and Multimedia

This course introduces the basic concepts and algorithms of computer graphics and computer graphics programming. Upon completion of this course, students will: 1) Describe the foundations of computer graphics; hardware systems, math basis, light, and color. 2) Identify applications of computer graphics. 3) Construct transformations, rotations, and scaling using transformation matrices, 4) Compose graphics programs using a graphics library. 5) Explain key components of the rendering pipeline, especially visibility, rasterization, viewing, and shading. 6) Explain the complexities of modeling realistic objects.

Students should expect a moderate amount of math content in trigonometry, vectors, and matrix transformations, and a moderate amount of programming assignments in this course. At this time, open-source Java-based language Processing and its graphics library are used for programming. Some exposure to 3D modeling in Blender or other 3D modeling software should also be expected.

# ITEC 3500 Information Technology Undergraduate Research

In this course, students will conduct undergraduate research in Information Technology. Students will need to coordinate with an ITEC professor to design the research project before enrollment. A student can register for 1-3 credit hours, but no more than 3 credit hours may be applied toward the major. May be repeated if topics are different.

# ITEC 3550 User Centered Design

* Students will walk through the entire product development lifecycle from the viewpoint of a consultant charged with making the final product ideally suited for the target customer.
* Tools and methods are learned and applied for data-centric research on:
  + identifying the correct target customers
  + Identification of customer needs and pain points
  + Technologies that must be employed
  + Analyzing the competitive landscape
  + Identifying and building the data architecture
  + Identifying the UI structure for optimal use by customers
  + Issues in accessibility
  + Reviews of organizations using UCD practices

# ITEC 3600 Operating Systems

This introductory course covers fundamental concepts of Operating System. This course covers four major areas in Operating Systems process management, memory management, file system management, and I/o management. In addition to the fundamental concept of Operating System, Students will install a Linux, especially ubuntu or any other Linux distribution equivalent to ubuntu to learn Linux commands, vi including regular expression, and Shell programming - Bourne shell, GNU Bourne-Again shell or C shell.

# ITEC 3700 Systems Analysis and Design

* Covers the phases of the Software Development Life Cycle (SDLC) and the Unified Model Language (UML.)
* No programming is required. It is content heavy with ten quizzes and two project-based exams.
* The course is project-based, with five or six projects that account for 60% of the grade.
* Students will learn to use a Computer Assisted Software Engineering (CASE) tool to create a model of the software to be built.
* The students only need to complete the prerequisites to register for the course. No special permission is required.

# ITEC 3860 Software Development I

First course in a sequence that teaches students to use the software development life cycle including problem definition, systems analysis, requirements gathering, designing systems, development of systems, testing and implementation. In this class students work in a group to finish a semester long project going through requirement elicitation, analysis, system design, object design, implementation and testing. Students get their first hands on experience with git and its usage in team collaboration. System architect and design patterns are discussed in this class to teach students how to build scalable, modular and reusable code. Students also work on individual programming assignments that emphasize OOP theory and they work on hands-on git assignments. Students are expected to discuss their code, data structure of choice and code refactoring.

# ITEC 3870 Software Development II

Programming heavy, project heavy, loaded course that also requires communicating with an external client and presenting at local STaRS/CREATE events. Software engineering topics are revisited from ITEC 3860 and an Agile approach is defined. Various software development architectures are reviewed, version control with git and branching strategies explained and practiced with assignments and part of project. JIRA project management software is practiced in assignment and used in project. Additional technologies such as Markdown, Node.JS, git, JSON are practiced. Students assigned articles to present in class.

# ITEC 3900 Professional Practice and Ethics

The focus of ITEC 3900, as noted in its title, is on professional “Practice” vs. memorization of material from the text. Students are expected to read all 10 chapters, garner information they deem the most important, and articulate their viewpoints in the oral and written format. In addition, students are divided into groups at the start of the semester for presentation purposes. Each group is expected to facilitate (1) a formal presentation and (2) a critical thinking activity corresponding to assigned chapters. Students not presenting earn points for sharing their thoughts in a respectful, non-judgmental, and professional manner. In addition to the above, students are expected to research jobs, internships, or grad schools that align with their career goals. Lastly, there is a comprehensive final exam which is open book.

To summarize:

* The class is mostly student-led
* Written assignments are required to demonstrate topic knowledge
* Participation (attendance) is required
* Group Presentations: Both a formal and a critical thinking activity
* Individual research project

# ITEC 4000 Cloud Computing Technologies

* This advanced course builds upon prior networking knowledge to present a top-down view of cloud computing from applications, administration and infrastructure. Topics include: History and overview of cloud computing systems, cloud service models, distributed storage systems, Raid technology, virtualization, security in the cloud and a practical analysis of current industry cloud platforms. Students will learn using Amazon Web Services Academy curriculum to help them prepare to take the AWS Certified Cloud Practitioner exam.
* Attendance and in-class hands-on activities will be essential to success in this course. Quizzes, Labs, Project and AWS CCP exam preparation.

# ITEC 4100 Advanced Networks

* This course covers more advanced networking protocols, concepts, design, principles and skills beyond ITEC 3100. The protocols include IPv6, DHCPv6 and HTTPS, and the concepts include VLAN trunks, Inter-VLAN routing and firewalls.
* This course is lab intensive, focusing on active learning through hands-on configuration of physical rack servers, router, managed switch and security appliance for various network topologies. Troubleshooting of network issues is a major component of the course and is done using command line utilities and system logs.
* Course assessment is done through lab assignments, tests and a comprehensive final exam.
* The following software is used for the course.
  + Cisco Packet Tracer for network design and simulation.
  + Cisco IOS commands to configure various network settings such as VLAN trunk ports, routing sub-interfaces for VLANs, SSH and protocol debugging. Security settings such as port-security, access control lists, security policies and DMZ are also configured.
  + Software installations and configurations on the servers include Linux, private DNS, SSH, Web proxy, KVM hypervisor and Screen CLI. Administrative tasks on Linux include editing network scripts and configuration files, firewall rules, security features, user and file permissions, and user/system profiles and environments.

# ITEC 4110 Digital Media Capstone Project

(4) Credit Hours   
Prerequisite: Two (2) courses from the following: [ITEC 4450](https://catalog.ggc.edu/content.php?filter%5B27%5D=ITEC&filter%5B29%5D=4110&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=41&expand=&navoid=5828&search_database=Filter#tt5914), [ITEC 4550](https://catalog.ggc.edu/content.php?filter%5B27%5D=ITEC&filter%5B29%5D=4110&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=41&expand=&navoid=5828&search_database=Filter#tt2786), [ITEC 4650](https://catalog.ggc.edu/content.php?filter%5B27%5D=ITEC&filter%5B29%5D=4110&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=41&expand=&navoid=5828&search_database=Filter#tt9502) [ITEC 4130](https://catalog.ggc.edu/content.php?filter%5B27%5D=ITEC&filter%5B29%5D=4110&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=41&expand=&navoid=5828&search_database=Filter#tt1097)   
Additional Requirement: Windows based laptop or Apple MacBook (see IT Laptop Program @ [www.ggc.edu/itlaptop](http://www.ggc.edu/itlaptop))  
This course applies advanced digital media concepts, principles and skills. Upon completion of this course students will be able to: (1) propose a project in the digital media realm. The project will result in the production of some form of digital media or address some novel use or implementation; (2) orally defend the proposal providing preliminary timelines and milestones; (3) generate a detail plan for the execution of the chosen project that includes timelines and milestones; (4) demonstrate consistent forward progress along that timeline; (5) collect documents and notes in a portfolio that documents the process, progress and setbacks encountered during this project (which must include dated project notes kept in a bound project notebook); (6) produce, publicize and present the project and final result in a formal public forum; (7) apply multimedia in digital media publication; (8) evaluate digital media; (9) understand legal issues on digital media.

# ITEC 4130 Human Computer Interaction

Please note this is not for catalog. Instead it is a course outline to help students understand what this course is about and what to expect in this course.

This course covers the basics of HCI design, the design principles and the framework and theories behind it, the process and basic activities of HCI design, mainly on user centered design process, and methods in carrying out those activities, the psychological and cognitive aspects of HCI design. Students will work on various assignments and a semester project to apply the concepts they learn.

# ITEC 4150 Enterprise Process Integration

The course addresses how business processes in an organization can be improved, innovated, and enabled by information technology. The course examines the methods and techniques to analyze, design, implement, automate, and integrate business processes using SAP ERP systems. This course is one of three courses that provides a pathway for obtaining the SAP student recognition award.

Upon completion of this course, students will:  
1. Understand how to describe and analyze processes in an organization  
2. Understand enterprise process modeling concepts and techniques  
3. Be able to model enterprise processes in an organization  
4. Be able to identify weaknesses in a given enterprise process design and suggest improvements  
5. Understand the basic steps and different approaches to process redesign  
6. Be able to redesign a given process with improvement patterns and best practices  
7. Be able to develop an implementation and integration strategy for IT-enabled enterprise processes

# ITEC 4170 International Studies in Information Technology

# ITEC 4200 Advanced Databases

This is the second course in the study of database systems as the main storage component of information systems. We will begin by understanding the principles related to the relational database model and designing a database application. Then we turn our attention to the use of Structured Query Language (SQL) within a modern enterprise database management system (DBMS). The focus of this class is an in-depth study of advanced SQL components, which can be used to prepare the student to pass the OCA Oracle Associate Certification Database SQL Exam (Optional).

Software: Oracle Database Express and SQL Developer. An Entity-Relationship Diagram modeling tool of the student’s choice is also required.

Class components: SQL Programming assignments, Quizzes, Exams and a semester project.

# ITEC 4210 Information Analytics

This course enables students to gain an appreciation and understanding of enterprise data, the benefits that can accrue from mining that data, and the kinds of technologies and systems needed to implement and mine enterprise-wide data warehouses. Students will use SAP Hana and related technologies to learn about data warehouse concepts, data modeling, ETL and data analytics. The course will include hands-on labs where students will gain an understanding of data warehouse systems and configurations. This course is one of three courses that provides a pathway for obtaining the SAP student recognition award.

# ITEC 4220 Advanced Data Analytics

This course will provide theory and practice of data analytics topics using different computing platforms, reading and access different data sources, create visualizations and perform statistical analysis, and learn to program in popular data-intensive languages. Students taking this course will obtain applied programming experience with hands-on projects involving real data. They will also explore and use popular data analysis platforms and tools. Lecture contents will be assessed with assignments and presentations. A combination of the following programming languages and environments will be used with some additional time to introduce them: R/Octave, Python, Javascript, and SQL. Using these languages, we will use additional modules, frameworks, and platforms such as Jupyter notebooks, Pandas, scikit , D3.js, Hadoop, and Spark. You can expect to access the course materials and grades via our course in Brightspace (Desire to Learn). We may also use additional online resources for programming, practice, and discussion. Students will be expected to present a poster with their project results at the end of the semester at an appropriate venue (CREATE Symposium or STaRS event, or similar).

# ITEC 4230 Data Science & Analytics Capstone Project

This course provides practical learning experiences and skills in Data Science and Analytics by engaging in a real-world complex DSA project; precisely, applying skills learned in previous classes focusing on all aspects of a DSA project (databases SQL or JSON, programming languages for DSA Python or R, data analytics tools and techniques, machine learning/AI algorithms, statistics, linear algebra) to solve a real DSA problem. The project involves working in a team guided by an external client (faculty or professional). Students will learn teamwork in Agile and practice project management skills using Jira, and best visualization practices to communicate their results to the client and public. Project deliverables include notebooks, a simple website showcasing interactive visualizations of the project and results, project repository (usually, under Github), reports, poster presentation at STARS/CREATE, and student assigned articles or tools to present in class. Participation in 3 outside the classroom DSA events (online or f2f, taking place at GGC or other schools) is mandatory to get in touch with the industry standards.

# ITEC 4250 Embedded Systems

# ITEC 4260 Software Testing and QA

This course covers a number of important concepts and techniques for testing software and ensuring its quality. You'll learn about testing software at various levels, from individual units and modules to larger subsystems and complete systems. You'll also learn both automatic and manual techniques for generating and validating test data.  
  
The course will take you through the entire testing process, from planning and design to execution and analysis. You'll learn about static and dynamic analysis, functional testing, inspections, and reliability assessment.  
  
By the end of the course, you'll have developed a solid understanding of software testing theory and gained practical skills in a variety of testing environments. You'll be able to create effective test cases and test your knowledge while working on QA and software testing projects.

# ITEC 4310 Operating Systems and Security

Focuses on the same domains as CompTIA Security+ Certification. If the student passes the Security+ Certification, they do not have to take the Final Exam, and they receive 100 points for the Final Exam.

Taught synchronous on-line using TestOut Curriculum. Labs, Class Notes, and Lectures are pre-recorded. Required! Each week, we meet on-line to discuss in depth the topics being covered in TestOut Curriculum.

Domains covered:

* Threat, Attacks, and Vulnerabilities
* Physical security
* Networks and Hosts Design and Diagnosis
* Devices and Infrastructure
* Identity, Access, and Account Management
* Cryptography and PKI
* Wireless Threats
* Virtualization, Cloud Security, and Securing Mobile Devices
* Securing Data and Applications
* Security Assessments
* Incident Response, Forensics, and Recovery
* Risk Management
* Governance and Compliance

TestOut also has a Security+ Practice test included in the price of the TestOut curriculum.

Class project is designed to promote you in your job interviews.

Heavy content on web labs and quizzes Midterm and Final Exam (unless you pass the Security+ Certification, you do not have to take the Final Exam)

No specific software is necessary. You must have a laptop and an Internet connection.

No instructor permission is required to register for the course. Just the 3300 Pre-req.

# ITEC 4320 Internet Security

This course was created with the expectation that you already know the following: What a network is; How a network functions; IP addressing; Subnetting; TCP/IP networking protocols; DNS and DHCP; Basic security practices. The purpose of this course is to allow students and IT professionals to move into the cybersecurity field. The course covers knowledge and skills such as:

1. Threats and vulnerabilities: use proactive threat intelligence to manage organizational security and vulnerability activities.
2. Software and systems: employ security solutions to manage infrastructure and understand software and hardware assurance best practices.
3. Compliance and assessment: apply security concepts for risk mitigation and learn the importance of frameworks, policies, procedures, and controls.
4. Security operations and monitoring: analyze security monitoring data and apply configuration changes to existing controls as a way to improve security.
5. Incident response: use the appropriate procedures, check potential indicators of compromise, and apply basic digital forensics techniques.

No projects, no coding.

This is a hands-on lab heavy course with 72 Labs, which average about 1 hour per lab, and 72 quizzes.

The labs are simulated in a real cloud environment offering each student their own virtual infrastructure, virtual network, and virtual machines. Most of the labs are done in Kali-Linux and Windows 10. No PC setup and no waste of time. Students can complete the course using a Chromebook.

The final exam is the unofficial version of the CompTia CySA+ professional certification exam.

The course is spaced out relatively evenly over a 15-week semester plus final exam week.

# ITEC 4330 System Administration

ITEC 4330 System Administration teaches students the fundamentals of system administration using modern operating systems. Upon the completion of the course, students are able to: 1) install and configure a multi-user serve OS and computer programs in a server computer; 2) manage (add, remove and/or restrict) user accounts in the system with access privileges; 3) monitor system resource (such as CPU, memory and I/O) usages and utilize the monitored results for effective administration; 4)operate master consoles using command line interfaces to install/configure/monitor computer systems; 5) use scripting language to automate common administration tasks; 6) describe basic issues (including user access privileges, file system permissions) in security as system administrator.

# ITEC 4400 Special Topics in Information Technology

# ITEC 4450 Web Development

This course covers fundamental programming concepts and techniques in web development. Upon completion of this course students will be able to: 1) Understand the basic concepts of web clients and servers, as well as how they enable the operation of web-based applications; 2) Choose appropriate technologies and development tools to address a given web development task; 3) Develop web site front-ends using client side programming; 4) Develop web site back-ends using server side programming; 5) Develop web sites that integrate with local or remote databases; and 6: Understand the development life cycle for web-based applications and services.

This course usually uses HTML/CSS for the font-end development and PHP/MySQL for the back-end development. Since students already acquired the basic skills of HTML/CSS in ITEC2130 and the basic skills of database in ITEC3200 as pre-reqs, this course focuses on integrating the font-end and backend using PHP. It adopts the project based hands-on approach. HTML and Database knowledge are heavily applied through the projects.

# ITEC 4550 Mobile Application Development

This course covers fundamental programming concepts and techniques used in mobile application development. Upon completion of this course, students will be able to design, simulate, construct, debug, test, deploy and document a substantial mobile application project.

After completing the course students will be able to:

1) Describe the various platforms and frameworks used to develop mobile applications.

2) Describe the mobile application life cycle.

3) Design, simulate, construct, debug, test and deploy mobile applications.

4) Create applications for a variety of devices.

5) Create user interfaces appropriate for mobile applications.

6) Interface with other co-resident applications, such as location-based services, browsers, and multimedia applications.

7) Interface with mobile platform peripheral interfaces, such as: cameras, near field communication sensors, Bluetooth, accelerometers, gyroscopes, and telephony hardware.

8) Publish applications in the mobile app ecosystem such as Google Play Store, Apple App Store, Windows App Store, etc.

# ITEC 4650 Game Development

* This course introduces the many facets of video game design and development. Upon completion of this course students will be able to:

1. Understand the main concepts of video game design including gameplay, environment, storyline, and characters.
2. Understand the main concepts of video game development including asset pipelines, user interfaces, and player controls.
3. Understand how to build networked video games.
4. Understand how to build mobile video games.
5. Leverage existing video game related engines, frameworks, and libraries.
6. Collaboratively develop video games of moderate complexity and scope.

* Unity 3D / C#. Lots of coding.
* Individual Assignments, Group Projects, Weekly Reading /Quizzes, Exams

# ITEC 4700 Artificial Intelligence

This course introduces Artificial Intelligence (AI), the science and engineering of building machines with human-level intelligence, with a focus on Machine Learning (ML), an AI technology that gives a machine the ability to acquire its own knowledge by extracting useful patterns from data. The course covers basic AI/ML models and their applications in business, information security, computer vision and other areas. The course involves

* Regular programming assignments where students use the Python programming language and important libraries including scikit-learn and TensorFlow to build AI/ML models for applications such as house price prediction, credit card fraud detection and photo tagging.
* Regular quizzes that test and reinforce students’ understanding of basic AI/ML concepts.
* A semester long project where students work in teams to design and implement AI/ML models to solve a real-world problem of their choice.

# ITEC 4750 Enterprise Architecture Design

This course develops the competencies necessary to conceptualize, design, implement and manage enterprise architecture. An enterprise architecture is a blueprint for organization change that describes how the organization operates today and how it intends to operate in the future. This course presents leading frameworks for developing and managing enterprise architecture; provides “hands on” experience with a variety of enterprise architecture modeling tools, techniques and methods; and introduce students to leading commercially-available enterprise-wide applications SAP ERP systems. This course is one of three courses that provides a pathway for obtaining the SAP student recognition award.

# ITEC 4810 Information Technology Project I

This is a project-based course. In this course, students will work on a semester-long self-selected Systems and Security capstone project. Project procedure includes project idea selection, related work comparison, project planning, project design, project implementation, and project summary and report. MS Project is used for project planning. Students will make presentations/demonstrations to show the progress of their projects. The project deliverables include final project report, user manual, and source code (if applicable).

# ITEC 4820 Information Technology Project II

# ITEC 4850 3D Modeling and Computer Animation

* This course is suitable for anyone that has an interest in 2D and 3D animation using modern production quality tools.
* No programming or artistic background is required.
* The only prerequisite is ITEC2110 Digital Media.
* Students will learn through live walk-along style demonstrations.
* Projects allowing creative freedom are used to practice the skills learned.
* Topics covered include:
  + Lighting, shadows, color, materials and textures.
  + Geometric and procedural modeling and sculpting
  + Character rigging, posing and animation
  + Animation of all aspects of a scene (keyframe animation)
  + 2D line art and animation
  + Choosing the right rendering engine and optimization.
  + Physics (cloth, water, wind, mist, flame, smoke, rigid and soft body dynamics)
* A final project pulls the semester work together into a final animated movie
* Expectations from students are based, in part, upon their individual background

# ITEC 4860 Software Development Project

This is a capstone project course designed specifically for Information Technology majors in the software development track. Upon completion of this course, you will be able to apply common software project practices, develop software projects, and understand the importance of system documentation. You will also read academic papers related to software development and build your soft skills as a professional in the IT industry.

Additionally, you'll learn how to deliver practical software that adheres to industry best practices. In this course, you will work on a significant software project and put your knowledge into practice. After completing this course, you'll be well-prepared to tackle real-world software development projects.

# ITEC 4900 Information Technology Internship

The purpose of this course is to provide the student with an opportunity to either intern with a company or organization during the semester or complete a field project sponsored by a company or agency. The student must complete a significant project in the Information Technology field, under the supervision of one or more personnel from the company or organization.

Another objective of this course is to help the student transition from college to the work environment and learn about professional networking. Other topics may include written and oral communication skills, proper business attire, and dealing with work-related issues.

# STEC 4800 Technology Ambassador Program

This is a service-learning course where students perform outreach by showcasing their student-led technology-based projects to the community. Each group of students works on one fun hands-on project throughout the semester from start to finish. Students brainstorm the project ideas, implement the projects using hands-on technologies and present their projects at classes on campus, at a GGC event for middle school students, at STaRS and/or CREATE Symposia at GGC, and at other outside events like the Atlanta Science Festival. Throughout the process, students collect data and learn how to create research posters, presentations, and papers. The benefits for the students include:

* Enhanced technical, communication, and leadership skills that look good on your resume
* Technical projects that demonstrate experience on your resume or graduate school application
* Exciting opportunities to build strong peer networks, and contribute and [get involved](https://www.ggc.edu/getinvolved) in your community
* Increased confidence, especially when speaking in front of groups and demonstrating leadership qualities
* Affiliation with national [STARS Leadership Corps](https://www.starscomputingcorps.org/) with possible funding to attend STARS Celebration, an annual leadership conference
* Potential for scholarship applications and REUs (research undergraduate programs fully funded during summer at various colleges).

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