

Ministry of Science and Higher Education

Harmonized Modular Curriculum

for

Bachelor of Science Degree

in

Information Technology

***October, 2020***

***Bahir Dar***

# EXECUTIVE SUMMARY

**Name of the program: Information Technology**

**Name of the degree to be awarded: Bachelor of Science Degree in Information Technology**

**Degree to be awarded by: -----**

**Standard period of study: 4 years/ 8 Semesters**

**Total CRH/ECTS: 148/248**

**Commencement of the Curriculum: 2019/2020**

**Remark: If there is any inconvenience in the curriculum regarding course name, course code, course weight (lecture, tutor, lab/practice, home study and CP) and other related issues, the semester course breakdown will govern.**

**Curriculum Revision Members**

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# Background

It has been felt in different corners and levels during the previous years that there is an urgent need of offering another program that target towards the technology needs of organizations. Information Technology (IT) has been demanded by potential employers in the country. IT degrees arose because degree programs in computer science were not providing a sufficient number of graduates capable of fulfilling these (technology needs of organizations) very real needs. Computer science emphases the scientific principles and theories of computing and is lead to the development of new knowledge in computing fields. Whereas Information technology is a relatively new and rapidly growing field that started in response to practical, everyday needs of organizations.

Information Technology is a term that has two meanings. On one hand Information Technology (Information Communication Technologies) is a general term encompassing all of computing. On the other hand, IT is used in universities to indicate a subject area that meets the computing technology needs of organizations.

ICT or IT in Ethiopia is rooting in different aspect of governmental, non-governmental organization, private companies and also individual life. This has lead for the demand of skilled people that involve in the troubleshooting, administration, integration, customization, etc. Especially currently the government has felt that ICT is an enabler force for developmental activities. Thus, supporting this effort by producing sufficient manpower is necessary. BSc in Information Technology is a response to this necessity.

# Rationale

Advancements and applications of information communication technologies have transformed the structure of the international and national economies, leading to new methods and practices in most institutions. Many Higher Learning Institutions in Ethiopia have also recognized this fact and introduced Information Technology study program.

However, within the HLIs, there are different versions of information Technology curricula which are based on diverse viewpoints. One of the results of this is the lack of common understanding between computing curricula in higher learning institutes of Ethiopia. Consequently, a revision was done on the curriculum in response to the following needs of the country to:

* Harmonize HLIs programs across the country so as to facilitate professional mobility for employment
* Implement a standardized curriculum at the national level
* Incorporate the ideas of Competence Based Education (CBE) on the curriculum
* Incorporate the ideas of modular approach on the curriculum
* Increase mobility of student from one university to the other
* Enable students to get certification up on the successful completion of the module

The curriculum has been prepared based on the generic curriculum of ministry of education, the workshops for harmonizing all programs held by the higher education strategy center in Addis Ababa considering stakeholder feedback, national consultative workshops, dynamic nature of the field of computing and knowledge in the field is expanding dynamically, incorporated courses directly related to latest technologies. Moreover, the curriculums design is geared towards preparing a national agreed upon modular curriculum for all programs offered at a university level throughout the country.

During the revision and development of the curriculum for information technology, all universities of the country were participated forming different clusters. Representative from 16 universities attended the workshop to consider the duration and harmonization of degree program in information technology. There were group sessions and plenary sessions. For these reasons and in line with the objective of addressing the country’s need, filling the skill gap based on the need analysis results and to give sufficient coverage for some courses, a four-year modular curriculum is developed by the representative universities.

# Program Objective

3.1 General Objective

To produce high quality IT graduates with entrepreneur and problem-solving mind set by providing to the students a broad knowledge and skill in information technology management and configuration and maintenance of ICT infrastructures.

3.2 Specific Objectives

* To produce graduates who possess the right combination of knowledge and practical skills to take care of an organization’s technology and infrastructure needs and people that needs it.
* To produce professionals that take responsibilities for selecting hardware and software products appropriate for an organization, integrating those products with organizational needs and infrastructure
* To produce graduates who will take the responsibility for installing, customizing and maintaining applications (network installation, network administration, Web site design, development of multimedia resources, and installation of communication components and oversight of email system) for the organization.
* To produce professionals to work in organizations implementing and managing automated information systems for different scientific, educational, commercial and other purposes.
* To produce graduates that plan and manage the technology lifecycle by which an organization’s technology is maintained, upgraded and replaced.

# Resources

4.1 Existing Laboratories and Other Resources

Currently there are 12 computer laboratories to conduct the lab session. All the laboratories have Internet connection. Additionally, there are offices equipped with all the necessary materials and network connection.

4.2 Human Resource

The table here under, shows human resource specialized in Computing fields.

The following table shows human resource based on position.

**On Duty**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Ac. Background** | **Rank** | **Total** |
| 1 | Ph.D | Associate and Assistant professor |  |
| 2 | M.Sc | Assistant professor |  |
| 3 | M.Sc. | Lecturer |  |
| 4 | B.Sc | Graduate assistant and Assistant lecturer |  |
| 5 | B.Sc& diploma | Technical Assistant |  |
| **Total** | | |  |

**On Study Leave**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Ac. Background** | **Study Program** | **On study** |
| 1 | M.Sc. | Ph.D |  |
| 2 | B.Sc | M.Sc. |  |
| Total | | |  |

# Professional profile

Through document analysis on different research organization websites in the field of Information Technology and based on other universities’ Information Technology programs,

It has been found professionals in the field of information technology do have:-

* Thorough understanding of the balance between theory and practice and the essential link between them not only the theoretical underpinnings of the discipline but also how that theory influences practice in the real world.
* Install, customize and maintain applications (network installation, network administration,
* design Web site, develop multimedia resources,
* install communication components and oversight of email system);
* Implement and manage automated information system
* Take care of an organization’s technology and infrastructure needs.
* A solid foundation that allows and encourages them to maintain their skills as the field evolves.

# Graduate Profile

The graduates of the program will have:

1. Cognitive skill

* Analyze, identify and define the IT requirements that must be satisfied to address problems or opportunities faced by organizations or individuals.
* Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to Information Technology.
* Identify and evaluate current and emerging technologies and assess their applicability to address the user’s needs.
* Analyze, adopt and demonstrate IT best practices, standards and their application.
* Analyze the impact of technology on individuals, organizations and society, including ethical, legal and policy issues;
* Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
* Demonstrate an understanding of best practices and standards and their application;

1. Technical skill

* Use and apply current technical concepts and practice in the core area of Information Technology.
* Design effective and usable IT-based solutions and integrate them into the user environment.
* Assist in the creation of an effective project plan.
* Demonstrate independent critical thinking and problem solving skills
* Use current techniques, skills, and tools necessary to maintain and administer computer based systems.

1. Attitude skill

* Collaborate in teams to accomplish a common goal by integrating personal initiatives
* Communicate effectively and efficiently with clients, users and peers both verbally and in writing, using appropriate terminology.
* Understand and explain the quantitative dimensions of a problem.
* Manage one’s own learning and development, including time management and organizational skills
* Keep abreast of current developments in the discipline to continue one’s own professional development.
* Recognize and be guided by the social, professional, and ethical issues involved in the use of computer technology.

# Attitudes and Values

The graduates will be inspired:

* To have professionalism at the center of their mentality;
* To have a positive and responsive attitude towards the value of information resources and towards their profession (love, dedication, commitment, etc.);
* To have good personal confidence in their jobs and professional activities;
* To have the sense of co-operation, honesty, loyalty, etc.; and
* To be ethical.

# Grading system

Based on the university legislation.

# Degree Nomenclature

English **Bachelor of Science Degree in Information Technology**

Amharic **የሳይንስ ባችለር ዲግሪ በኢንፎርሜሽን ቴክኖሎጂ**

# Program profile

10.1 Admission Requirements

Admission requirements would be similar to the general institutional requirements. That is, the student should complete preparatory level education and the entry point is determined accordingly by the Ministry of Education for the regular students whereas the admission criteria for distance and continuing education program are as per the University’s requirement.

10.2 Duration of the Study

* Students will not take different computing courses at their high school study
* The nature of the discipline needs many practical works

Considering the above facts, program objectives and graduate profile, under normal circumstances, four years of study are required to complete the program.

10.3 Mode of delivery

* Mode of delivery is mixed, parallel semester and block but the recommended mode of delivery for this program is parallel

10.4 Teaching methods

* Lecture
* Demonstration
* Student presentation
* Project work
* Home study (assignment)
* Discussion
* Question and answering
* Class work (group work)

10.5 Graduation Requirements

The major graduation requirements for Regular and CEP program include:

* Successful completion of all courses(240CP);
* A Cumulative Grade Point Average (CGPA) of at least 2.00;
* A Cumulative Grade Point Average (CGPA) of at least 2.00 in major courses;
* At least C grade in the Industrial Project courses;
* No grade of "F" in any of the courses.

10.6 Medium of Instruction

The medium of instruction for the program is English.

# Assessment and Evaluation

Cognitive Abilities: Cognitive abilities are assessed by a combination of written examinations and continuous assessment, including marked essays, class tests and computer programming problems.

Practical Abilities: Practical Abilities are assessed mostly by continuous assessment. Some of practical abilities are assessed as part of group project module.

Transferable skills: some skills, like the use of software tools and ability to communicate orally and in written form are directly assessed, in assignments or project, other skills are not directly assessed but their effective use will enhance the students overall performance.

Evaluation will be done based on the midterm exam, assignments, laboratory sessions demonstrations, Project work, final exam and different continues assessments.

# Quality Assurance Measures

* Comprehensive examinations and colleague assessment of examination papers and teaching methods;
* Periodical workshops (with stakeholders, teachers and graduates);
* Assessments by using survey project works (researches), internships, and link programs;
* Graduates' evaluation of the program;
* Standardization of course offerings through preparation of general course outlines, exam contents, and external audit;
* Annual assessment of the program by the teaching staff;
* Establishing Alumni of Graduates as a mechanism to assess their career development;
* Working closely with the relevant professional associations to assess graduates' performance.
* Ensuring lab sessions conduction manner as per the requirements set in the curriculum.

# Assignment of Module and Course Codes

The course code will have four alphabets and four digits numbers like ITec2022. The four alphabets code indicates the home base of the program with the first and second alphabets in capital letter, for instance, ITec indicates abbreviation of the program of Information Technology. The four digits indicates the year of course offering (the first number, ‘2’, indicates the level of the course in terms of the year it is offered; accordingly '1' for 1st year, '2' for 2nd year, ‘3’ for 3rd year and ‘4’ for 4th year courses); the middle numbers, ‘02’, indicates module code number in the program (example 01, 02, 03, 04, 05, 06, 07, 08, 09, 10), the last number, ‘2’, indicates the semester, accordingly Odd indicates first semester and Even indicates second semester.

# Attendance

85% attendance is required for lecture session and 100% attendance is required for lab or workshop practice session.

# List of Modules and Courses

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Module Number** | **Module Name** | **Course Code** | **Courses** | **ECTS** | Cr. Hrs | **Total** |
| **01** | **Common course** | ITec 1012 | Introduction to Emerging Technologies | 5 | **3** | **80** |
| EnLa 1011 | Communicative English Skills I | 5 | **3** |
| GeES 1011 | Geography of Ethiopia and the Horn | 5 | **3** |
| Phys 1011 | General Physics | 5 | **3** |
| Psyc 1011 | General Psychology and Life Skills | 5 | 3 |
| LoCT 1011 | Critical thinking | 5 | 3 |
| SpSc 1011 | Physical fitness | (P/F) | - |
| Math 1011 | Basic Mathematics for Natural Sciences | 5 | 3 |
| EnLa 1012 | Communicative English Skills II | 5 | 3 |
| Hist. 1012 | History of Ethiopia and the Horn | 5 | 3 |
| CoSc 1012 | Basic Computer Programming | 5 | 3 |
| Math 1012 | Applied Mathematics | 5 | 3 |
| MCiE 1012 | Moral and Civic education | 4 | 2 |
| Anth1012 | Anthropology of Ethiopian Societies and Cultures | 4 | 2 |
| Gltr2015 | Global Tend and International Relations | 4 | 2 |
| Incl2011 | Inclusiveness | 4 | 2 |
| Eco2013 | Economics | 5 | 3 |
| Enbd5012 | Entrepreneurship and business development | 4 | 2 |
| **02** | Computer Systems | ITec2024 | Computer Organization and Architecture | 5 | 3 | 10 |
| ITec2022 | Operating Systems | 5 | 3 |
| **03** | Computer Maintenance | ITec3031 | Computer Maintenance and Technical Support | 5 | 3 | 5 |
| **04** | Basic Programming | ITec2041 | Fundamental Programming II | 5 | 3 | 5 |
| **05** | Advanced Programming | ITec2052 | Data structure and Algorithms | 5 | 3 | 25 |
| ITec3051 | Object Oriented Programming in Java | 5 | 3 |
| ITec3054 | Event-Driven Programming | 5 | 3 |
| ITec3056 | Advanced programming | 5 | 3 |
| ITec3058 | Mobile Application Development | 5 | 3 |
| **06** | System Development and Project Management | ITec3061 | System Analysis and Design | 5 | 3 | 10 |
| ITec3062 | Information Technology Project Management | 5 | 3 |
| **07** | Database Systems | ITec2071 | Fundamentals of Database Systems | 5 | 3 | 10 |
| ITec3071 | Advanced Database Systems | 5 | 3 |
| **08** | Information Management | ITec3082 | Information Storage and Retrieval | 5 | 3 | 10 |
| ITec4081 | GIS and Remote Sensing | 5 | 3 |
| **09** | Web Systems and Technologies | ITec2091 | Internet Programming I | 5 | 3 | 10 |
| ITec3093 | Internet Programming II | 5 | 3 |
| **10** | Computer Networks | ITec2102 | Data Communication and Computer Networks | 5 | 3 | 20 |
| ITec3102 | Introduction to Distributed Systems | 5 | 3 |
| ITec4101 | Wireless Networking and Telecom Technologies | 5 | 3 |
| **11** | Network Design and Administration | ITec4114 | Network Design | 5 | 3 | 15 |
| ITec4112 | System and Network Administration | 5 | 3 |
| ITec4111 | Network Device and Configuration | 5 | 3 |
| **12** | Artificial Intelligence and Multimedia | ITec3121 | Multimedia Systems | 5 | 3 | 10 |
| ITec4121 | Artificial Intelligence | 5 | 3 |
| **13** | Information Technology and Society | ITec4133 | Information Assurance and Security | 3 | 2 | 7 |
| ITec4134 | Social and Professional Ethics in Information Technology | 3 | 2 |
| ITec4131 | Seminar on Current Trends in Information Technology | 1 | 1 |
| **14** | Elective | ITec4148 | Integrative Programming and Technologies | 5 | 3 | 5 |
| ITec4144 | Int. to Data mining and Warehousing | 5 | 3 |
| ITec4146 | E-Commerce | 5 | 3 |
| ITec4142 | Computer Graphics | 5 | 3 |
| **15** | IT Research and Project | ITec4151 | Internship | 3 | 2 | 16 |
| ITec4155 | Basic Research Method in IT | 3 | 2 |
| ITec4153 | Final year Project I | 5 | 3 |
| ITec4154 | Final year Project II | 5 | 3 |
| **16** | Electricity and Electronics | Eeng2161 | Fundamentals of Electricity and Electronics Device | 5 | 3 | 5 |
| **17** | Basic Statistics | Stat2171 | Introduction to Statistics | 5 | 3 | 5 |
| **18** | Discrete Mathematics | Math2182 | Discrete Mathematics | 5 | 3 | 5 |
| Total ECTS/ Cr. Hrs | | | | | 148 | 248 |

# Regular Semester Breakdown

**Year I Semester I**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | Basic Mathematics for Natural Sciences | Math 1011 | 3 | 5 | 3 | 0 | 2 | 5 |
| 2 | Communicative English Skills I | EnLa 1011 | 3 | 5 | 3 | 0 | 0 | 8 |
| 3 | Geography of Ethiopia and the Horn | GeES 1011 | 3 | 5 | 3 | 0 | 0 | 5 |
| 4 | General Physics | Phys 1011 | 3 | 5 | 3 | 0 | 3 | 10 |
| 5 | General Psychology and Life Skills | Psyc 1011 | 3 | 5 | 2 | 0 | 3 | 10 |
| 6 | Critical thinking | LoCT 1011 | 3 | 5 | 3 | 0 | 0 | 6 |
| 7 | Physical fitness | SpSc 1011 | **-** | 0(P/F) | 0 | 2 | 0 | 6 |
| **Total** | | | **18** | **30** | **16** | **2** | **9** | **49** |

**Year I Semester II**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | Introduction to Emerging Technologies | EmTe 1012 | 3 | 5 | 2 | 0 | 3 | 10 |
| 2 | Communicative English Skills II | EnLa 1012 | 3 | 5 | 3 | 0 | 0 | 8 |
| 3 | History of Ethiopia and the Horn | Hist. 1012 | 3 | 5 | 3 | 0 | 0 | 5 |
| 4 | Basic Computer Programming | CoSc 1012 | 3 | 5 | 2 | 3 | 0 | 5 |
| 5 | Applied Mathematics | Math 1012 | 3 | 5 | 3 | 0 | 3 | 10 |
| 6 | Moral and Civic education | MCiE 1012 | 2 | 4 | 2 | 0 | 0 | 6 |
| 7 | Anthropology of Ethiopian Societies and Cultures | Anth 1012 | 2 | 4 | 2 | 0 | 0 | 4 |
| **Total** | | | **19** | **33** | **17** | **3** | **6** | **48** |

**Year II Semester I**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | Global Trends and International Relations | Gltr2015 | 2 | 4 | 2 | 0 | 2 | 4 |
| 2 | Inclusiveness | Incl2011 | 2 | 4 | 2 | 0 | 2 | 4 |
| 3 | Economics | Eco2013 | 3 | 5 | 2 | 0 | 3 | 5 |
| 4 | Fundamentals of Programming II | ITec2041 | 3 | 5 | 2 | 3 | 0 | 5 |
| 5 | Fundamentals of Database Systems | ITec2071 | 3 | 5 | 2 | 3 | 0 | 6 |
| 6 | Introduction to Statistics | Stat2171 | 3 | 5 | 2 | 0 | 2 | 3 |
| 7 | Fundamentals of Electricity and Electronics Device | Eeng2161 | 3 | 5 | 2 | 3 | 0 | 5 |
| **Total** | | | 19 | **33** | **14** | **9** | **9** | **32** |

**Year II Semester II**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | Operating Systems | ITec2022 | 3 | 5 | 3 | 3 | 0 | 5 |
| 2 | Computer Organization and Architecture | ITec2024 | 3 | 5 | 2 | 0 | 3 | 5 |
| 3 | Data Communication and Computer Networks | ITec2102 | 3 | 5 | 2 | 3 | 0 | 5 |
| 4 | Data structure and Algorithms | ITec2052 | 3 | 5 | 2 | 3 | 0 | 5 |
| 5 | Discrete Mathematics | Math2182 | 3 | 5 | 3 | 0 | 2 | 5 |
| 6 | Internet Programming I | ITec2092 | 3 | 5 | 2 | 3 | 0 | 5 |
| Total | | | **18** | **30** | **14** | **12** | **5** | **30** |

**Year III Semester I**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | System Analysis and Design | ITec3061 | **3** | 5 | 2 | 0 | 3 | 5 |
| 2 | Multimedia Systems | ITec3121 | **3** | 5 | 2 | 3 | 0 | 5 |
| 3 | Object Oriented Programming in Java | ITec3051 | **3** | 5 | 2 | 3 | 0 | 5 |
| 4 | Internet Programming II | ITec3093 | **3** | 5 | 2 | 3 | 0 | 5 |
| 5 | Advanced Database Systems | ITec3071 | **3** | 5 | 2 | 3 | 0 | 5 |
| 6 | Computer Maintenance and Technical Support | ITec3031 | **4** | 7 | 2 | 4 | 1 | 5 |
| Total | | | **19** | 32 | 10 | 16 | 4 | 30 |

**Year III Semester II**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | Introduction to Distributed Systems | ITec3102 | **3** | 5 | 2 | 3 | 0 | 5 |
| 2 | Information Technology Project Management | ITec3062 | **3** | 5 | 2 | 0 | 3 | 5 |
| 3 | Event-Driven Programming | ITec3054 | **3** | 5 | 2 | 3 | 0 | 5 |
| 4 | Information Storage and Retrieval | ITec3082 | **3** | 5 | 2 | 3 | 0 | 5 |
| 5 | Advanced Programming | ITec3058 | **3** | 5 | 2 | 3 | 0 | 5 |
| 6 | Mobile Application Development | ITec3056 | **3** | 5 | 2 | 3 | 0 | 5 |
| Total | | | **18** | **30** | **10** | **15** | **3** | **30** |

**Year IV Semester I**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | Artificial Intelligence | ITec4121 | **3** | 5 | 2 | 3 | 0 | 5 |
| 2 | Internship | ITec4151 | **2** | 3 | 0 | 3 | 0 | 3 |
| 3 | Information Assurance and Security | ITec4133 | **3** | 3 | 2 | 0 | 0 | 3 |
| 4 | Final year Project I | ITec4153 | **3** | 5 | 0 | 5 | 0 | 5 |
| 5 | GIS and Remote Sensing | ITec4081 | **3** | 5 | 2 | 3 | 0 | 5 |
| 6 | Basic Research Method in IT | ITec4155 | **2** | 3 | 2 | 0 | 0 | 3 |
| 7 | Network Device and Configuration | ITec4111 | **3** | 5 | 2 | 3 | 0 | 5 |
| 8 | Seminar on Current Trends in IT | ITec4131 | **1** | 1 | 1 | 0 | 0 | 1 |
| Total | | | **17** | **30** | **11** | **17** | **0** | **30** |

**Year IV Semester II**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Tittle** | **Course Code** | **CRH** | **ECTS** | **Lec** | **Lab** | **Tut** | **HS** |
| 1 | Final year Project II | ITec4154 | **3** | 5 | 0 | 5 | 0 | 5 |
| 2 | System and Network Administration | ITec4112 | **3** | 5 | 2 | 3 | 0 | 5 |
| 3 | Social and Professional Ethics in IT | ITec4134 | **2** | 3 | 2 | 0 | 0 | 4 |
| 4 | Network Design | ITec4114 | **3** | 5 | 2 | 3 | 0 | 5 |
| 5 | Entrepreneurship and business development | Enbd5012 | **2** | 4 | 2 | 0 | 3 | 5 |
| 6 | Elective | ITec414x | **3** | 5 | 2 | 3 | 0 | 5 |
| 7 | Wireless Networking and Telecom Technologies | ITec4102 | **3** | 5 | 2 | 3 | 0 | 5 |
| Total | | | **19** | **32** | **12** | **17** | **3** | **34** |

# Total ECTS

|  |  |
| --- | --- |
| **Category** | **ECTS** |
| Core Courses | 146 |
| Elective Courses | 5 |
| Common/Supportive Courses | 95 |
| Total | 250 |
| Mandatory Total | 242 |

# Module Guidebook and Course Description

|  |  |  |
| --- | --- | --- |
| **--------------**  **---------------------**  **Information Technology Program** | | |
| **Module Number** | **02** | |
| **Module Name** | **Computer Systems** | |
| **Total CP of the module** | **10** | |
| **Mode of Delivery** | **Parallel** | |
| **Module Competency** | The module provides the competency of understanding the basic Components of computer Organization and Architecture, explain the components of Operating system and know the functionality of operating system | |
| **Module description** | * This module covers Digital logic and digital systems; Data Representation; Assembly level machine organization; Memory system organization and architecture; Interfacing and communication; Functional organization; History overview and design principles of operating system; Scheduling and dispatch, memory and device management; Protection, access, and authentication and File systems | |
| **module Objective** | **At the end of this module students should be able to:-**   * Identify Boolean algebra, logic gate and their relationship * Describe basic digital components of computer like decoder, encoder, register, counter, multiplexer etc… * Describe data representation and basic instruction in a computer system * Describe control unit and ALU design * Identify memory and input/output organization in a basic computer system * Identify BIOS and its setting * Perform disk partitioning and manipulating * Install, use and troubleshoot windows and Linux operating system | |
| **Courses in the Module** | | |
| **Course Code** | **Course Name** | **CP** |
| **ITec2024** | Computer Organization and Architecture | 5 |
| **ITec2022** | Operating Systems | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | **Information Technology** | | | | |
| **Course Code** | **ITec2021** | | | | |
| **Course Title:** | **Computer Organization and Architecture** | | | | |
| **Degree Program** | **Information Technology** | | | | |
| **Module Name** | **Computer Systems** | | | | |
| **Module No.** | **ITec-M2024** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours** | ***Lecture*** | ***Tutorial*** | ***Lab/Practical*** | ***Home Study*** | ***Total*** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: I | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | All students of computing should acquire some understanding and appreciation of a computer system’s functional components, their characteristics, their performance, and their interactions. Students need to understand computer architecture in order to structure a program so that it runs more efficiently on a real machine. The focus of this course is to deal with Digital logic and digital systems; Machine level representation of data; Assembly level machine organization; Memory system organization and architecture; Interfacing and communication; and Functional organization. | | | | |
| **Course Objective** | * Describe the progression of computer architecture from vacuum tubes to VLSI. * Demonstrate an understanding of the basic building blocks and their role in the historical development of computer architecture. * Use mathematical expressions to describe the functions of simple combinational and sequential circuits. * Design a simple circuit using the fundamental building blocks. | | | | |
| **Course Outline** | 1. **Digital logic and digital systems**    1. Overview and history of computer architecture    2. Fundamental building blocks (logic gates, flip-flops, counters, registers, PLA)    3. Logic expressions, minimization, sum of product forms    4. Register transfer notation    5. Physical considerations (gate delays, fan-in, fan-out) 2. **Data Representation**     1. University s, bytes, and words    2. Numeric data representation and number bases    3. Fixed- and floating-point systems    4. Signed and twos-complement representations    5. Representation of nonnumeric data (character codes, graphical data)    6. Representation of records and arrays 3. **Assembly level machine organization**    1. Basic organization of the von Neumann machine    2. Control unit; instruction fetch, decode, and execution    3. Instruction sets and types (data manipulation, control, I/O)    4. Assembly/machine language programming    5. Instruction formats    6. Addressing modes    7. Subroutine call and return mechanisms    8. I/O and interrupts 4. **Memory system organization and architecture**    1. Storage systems and their technology    2. Coding, data compression, and data integrity    3. Memory hierarchy    4. Main memory organization and operations    5. Latency, cycle time, bandwidth, and interleaving    6. Cache memories (address mapping, block size, replacement and store policy)    7. Virtual memory (page table, TLB)    8. Fault handling and reliability 5. **Interfacing and communication**    1. I/O fundamentals: handshaking, buffering, programmed I/O, interrupt-driven I/O    2. Interrupt structures: vectored and prioritized, interrupt acknowledgment    3. External storage, physical organization, and drives    4. Buses: bus protocols, arUniversity ration, direct-memory access (DMA)    5. Introduction to networks    6. Multimedia support    7. RAID architectures 6. **Functional organization** 7. Implementation of simple data paths 8. Control unit: hardwired realization vs. micro programmed realization 9. Instruction pipelining 10. Introduction to instruction-level parallelism (ILP) | | | | |

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| **Assessments** | As per the University Legislative |
| **Text Reference** | * *D. A. Patterson and J. L, Hennessy* (1996) Computer Architecture: A Quantitative Approach, 2nd edition. Morgan Kaufmann, Inc. * *D.A. Patterson and J.L Hennessy (1991}* Computer Organization and Design: The * Hardware/Software Interface, 2nd edition. Morgan Kaufmann Publishers * J.D. Carpinelli (2000) Computer Systems Organization and Architecture, Addison Wesley Pub Co. * *A.S. Taneubaum*(1998) Structured Computer Organization. Prentice Hall M. * M. Mario (1992) Computer System Architecture, Prentice Hall * Hemacher: Computer Organization |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | **Information Technology** | | | | |
| **Course Code** | **ITec2022** | | | | |
| **Course Title:** | **Operating Systems** | | | | |
| **Degree Program** | **Information Technology** | | | | |
| **Module Name** | **Computer Systems** | | | | |
| **Module No.** | **ITec-M2021** | | | | |
| **CP Credits (CP)** | 6 | | | | |
| **Contact Hours (per week)** | ***Lecture*** | ***Tutorial*** | ***Lab/Practical*** | ***Home Study*** | ***Total*** |
| 3 | 0 | 3 | 6 | 12 |
| **Target Group:** | 2nd Year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: II | | | | |
| **Pre-requisites** | ITec1011 | | | | |
| **Status of the Course** | Core | | | | |
| **Course Objective** | The course introduces students to basics of operating system design principles and components, and their functions. It will also discuss memory management, processor management, process management and deadlocks, concurrency control, scheduling and dispatching, device management, file systems, file management, security and protection, and system performance evaluation. In addition, students will be introduced with different operating systems, and they will see their similarities and differences. | | | | |
| **Course Outline** | **Chapter 1: History and overview**   * 1. Indicate some reasons for studying operating systems   2. Indicate some important topic areas such as function and design, concurrency, scheduling, dispatch, memory management, device management, file systems, security, and protection   3. Describe the purpose of an operating system   4. Indicate the meaning of an interrupt   5. Describe the meaning of concurrency and the reasons for its importance   6. Illustrate the manner in which scheduling and dispatch take place in a computer through its operating system   7. Describe the manner and importance of memory management   8. Describe the manner and importance of device management   9. Explore some additional resources associated with operating systems   10. Explain the purpose and role of operating systems in computer engineering   **Chapter 2: Design principles**   * 1. Functionality of a typical operating system   2. Mechanisms to support client-server models, hand-held devices   3. Design issues (efficiency, robustness, flexibility, portability, security, compatibility)   4. Influences of security, networking, multimedia, windows   5. Structuring methods (monolithic, layered, modular, micro-kernel models)   6. Abstractions, processes, and resources   7. Concepts of application program interfaces (APIs) specific to operating systems   8. Applications needs and the evolution of hardware/software techniques   9. Device organization   10. Interrupts: methods and implementations   11. Concept of user/system state and protection, transition to kernel mode   **Chapter 3: Design principles**   * 1. States and state diagrams   2. Structures (ready list, process control blocks, and so forth)   3. Dispatching and context switching   4. The role of interrupts   5. Concurrent execution: advantages and disadvantages   6. The “mutual exclusion” problem and some solutions   7. Deadlock: causes, conditions, prevention   8. Models and mechanisms (semaphores, monitors, condition variables, rendezvous)   9. Producer-consumer problems and synchronization   10. Multiprocessor issues (spin-locks, reentrancy)   **Chapter 4: Scheduling and dispatch**   * 1. Preemptive and non-preemptive scheduling   2. Schedulers and policies   3. Processes and threads   4. Deadlines and real-time issues   **Chapter 5: Memory management**   * 1. Review of physical memory and memory   2. management hardware   3. Overlays, swapping, and partitions   4. Paging and segmentation   5. Placement and replacement policies   6. Working sets and thrashing   7. Caching   **Chapter 6: Device management**   * 1. Characteristics of serial and parallel devices   2. Abstracting device differences   3. Buffering strategies   4. Direct memory access   5. Recovery from failures   **Chapter 7: Security and protection**   * 1. Overview of system security   2. Policy/mechanism separation   3. Security methods and devices   4. Protection, access, and authentication   5. Models of protection   6. Memory protection   7. Encryption   8. Recovery management   **Chapter 8: File systems**   * 1. Files: data, metadata, operations, organization, buffering, sequential, non sequential   2. Directories: contents and structure   3. File systems: partitioning, mount/unmount, and virtual file systems   4. Standard implementation techniques   5. Memory-mapped files   6. Special-purpose file systems   7. Naming, searching, access, backups | | | | |
| Software Requirements | UNIX/Linux operation systems | | | | |
| **Assessment** | As per the University Legislative | | | | |
| **Text Reference:** | Andrew S. Tanenbaum (1992) Modern Operating Systems. Prentice-Hall International Inc.   * Operating Systems, 4th edition by W. Stalling (editor) Prentice-Hall 2001 * Distributed Systems: Concepts and Design (3rd edition), George Coulouris, Jean * Dollimore and Tim Kindberg, Addison Wesley Longman, 2000. * Distributed Programming with Java, Qusay H. Mahmoud, Manning Publications Co., 2000. * Distributed Systems: Principles and Paradigms, Andrew S. Tanenbaum and Maarten van Steen, Prentice-Hall, 2002. | | | | |

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| **--------------**  **---------------------------**  **Information Technology Program** | | |
| **Module Number** | **03** | |
| **Module Name** | **Computer Maintenance** | |
| **Total CP of the module** | **5** | |
| **Mode of Delivery** | **Parallel** | |
| **Module Competences** | * Student will have the competency of identifying failures of computer hardware and software and properly applying the procedures of maintenance and repairing of computer hardware | |
| **Module description** | This module covers basics of computer; Preventive maintenance and troubleshooting; Removing, replacing and Troubleshooting motherboard and computer case; history, types and upgrading CPU; Identify Memory Problems and upgrading; Power supplies; Storage Devices; I/O Connectors; Operating System Installation and Management | |
| **Objective of the module** | The objectives of the module are:   * To Understand concepts of maintenance and troubleshooting * Choose CPU that matches their motherboard and install it * Choose different cards that match their motherboard and install them * Install RAM, Cards and other devices * Diagnose computer problems and solve the problems * Upgrade computer system hardware * Install OS and any other application software * Identify and solve computer problems whether software related or hardware related * Understand and identify PC hardware components | |
| **Courses in the Module** | | |
| **Course Code** | **Course Name** | **CP** |
| **ITec2032** | Computer Maintenance and Technical Support | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | **Information Technology** | | | | |
| **Course Code** | **ITec3031** | | | | |
| **Course Title:** | **Computer Maintenance and Technical Support** | | | | |
| **Degree Program** | **Information Technology** | | | | |
| **Module Name** | **Computer Maintenance** | | | | |
| **Module No.** | **ITec-M3031** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours** | ***Lecture*** | ***Tutorial*** | ***Lab/Practical*** | ***Home Study*** | ***Total*** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 3rd year Information Technology Students | | | | |
| **Year /Semester** | Year: III, Semester: I | | | | |
| **Pre-requisites** | **Computer Organization and Architecture** | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course exposes the student to hardware components of computer system and software from technician’s point of view. The course teaches about CPU . types and installation, RAM types and installation, expanding computer using cards, troubleshooting computer problems, and installing OS and application packages. Solving problems related computer system, whether hardware or software, is what the course deals about. | | | | |
| **Course Objective** | After completion of this course ,students will be able to :  Understand and identify PC hardware components  Build, configure, upgrade, and maintain a computer  Install operating systems and application software  Providing basic knowledge of preventive maintenance and how to use windows built-in diagnostic tools.  To have practical experience of troubleshooting PC hardware and  software problems  Understand concepts of maintenance and troubleshooting  Choose CPU that matches their motherboard and install it   * Choose different cards that match their motherboard and install them * Install RAM, Cards and other devices * Diagnose computer problems and solve the problems | | | | |
| **Course Outline** | C **hapter one**  **Basics**   * General concepts about PC and tech support * Lab procedures and maintenance tools * Static energy and its effect on computers * Safety rules * Preventive maintenance and troubleshooting   **Chapter two**  **Computer Cases and the Motherboard**   * Computer cases * Safety and the computer * System Cover removal and replacement * System board defined * System board evolution * Removing and replacing motherboard * Troubleshooting the motherboard   **Chapter three CPU**   * History of CPU * Types of CPU * CPU Sockets and slots * Upgrading CPUs   **Chapter Four Memory**   * Random Access Memory defined * Physical memory packaging * Types of memory * Read-only Memory and Cache Memory * Identify Memory Problems and upgrading   **Chapter Five Power Supplies**   * Power supplies * Types of power supply * Batteries * Troubleshooting the Power Supply   **Chapter Six Storage Devices**   * The Floppy Drive * The Hard Drive * The CD-ROM Drive   **Chapter seven Bus and Cards**   * Bus * Types of Bus * Cards * The Video Card * The Sound Card * Network card   **Chapter eight I/O Connectors**   * The Serial Port * The Parallel Port * I/O connectors   **Monitor**   * Introduction to Monitor * Types of Displays * Health and Safety Concerns * Monitor Connections * Troubleshooting the Video System   **BIOS**   * Basic Input/Output System * Error messages and solutions * Advanced BIOS Features   **Printers**   * Printer Types and Printer Technology * Printer Field Replaceable Units * Printer Maintenance Techniques   **Chapter nine Software Concepts**  **Introductions**   * History of Operating System * Types of Operating System * Purpose of Operating System   **2. Disk use, Booting and File systems**  File systems:  o FAT  o NTFS  o HPFS   * Sectors, Clusters and Fragmentation * Boot sector and other areas of disk * NTLDR, GRUB, LILO and other boot loader   **Registry Editing in Windows**   * What is Registry * Managing and Editing Registry * Back up registry   **4. OS Architecture and Important OS files**   * Architecture of Windows NT * Kernel * Types of Kernel * Important Windows files (NTdetect.com, Boot.ini, NTLDR, etc)   **5. Installing Hardware, and Software**   * How to install hardware and drivers * Plug and Play devices * Installing/uninstalling application software   **6. Operating System Installation and Management**   * Install Windows as single or dual boot * Recover failed Windows OS * Install Linux as Single or dual Boot * Manage user accounts and access rights * Computer security ring * Disable/Enable registry editing, task manager, and Command Prompt * Use Administrative tools and control Panel   **7. Resource Sharing and Management**   * File Sharing * Printer Sharing * Server management (e.g. Web server)   Protecting attacks(e.g. Virus)  **Lab. Classes:**  Computer Disassembly  Disassemble a computer using safe lab procedures and proper tools.  Computer Assembly  Install the Power Supply  Install the Motherboard  Install the Drives  Install Adapter Cards  Install Internal Cables  Complete the Computer Assembly  Boot the Computer  Software Maintenance   * Preventive Maintenance * Adaptive software Maintenance * Perfective software maintenance * Corrective software Maintenance   **Operating System**   * Upgrade different software Components * Creating bootable device based on different os * Install different versions of windows OS * Windows User Accounts and Update * FAT32 and NTFS * Run Commands * Install Third-Party Software * Restore Point * Windows Backup and Recovery | | | | |
| **Assessment Methods** | As per the University Legislative | | | | |
| **Reference** | 1. PC troubleshooting and repair , Stephen J. Bigelows 2. PC troubleshooting and repair   Stephen J. Bigelows(**available at main Library**)   1. A+ a complete guide, third edition.   By David Groth (**available in softcopy**)   1. Upgrading and Repairing Microsoft Windows   By Scott Mueller, Brian Knittel (**available in softcopy**) | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | |
| Module Number | **04** | |
| Module Name | **Basic Programming** | |
| Module CP | **10** | |
| Mode of Delivery | **Parallel** | |
| Module Competences | * Students will be equipped with the necessary skills in designing, coding, debugging and documenting large programs using procedural programming style. | |
| Module Description | * This module covers Problem solving; history and structure of C++; Constants, Variables, data Types and Operators; Selection and Repetition Statements; Arrays and Functions; Fundamentals of Classes; Operator Overloading; file streams ;templates and exception handling | |
| Module Objectives | At the end of this module students will able to :   * Have a sound background about the basic programming languages and will be in a position to develop and a small scale program. | |
| ***Courses in the Module*** | | |
| **Course Code** | **Course Name** | **CP** |
| CoSc 1012 | Basic Computer Programming | 5 |
| ITec2041 | Fundamentals of Programming II | 5 |

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| **University Logo**  **University Name**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** |  | | | | |
| **Course Title:** | Basic Computer Programming | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Basic programming | | | | |
| **Module Code.** | ITec-M1041 | | | | |
| **Course Chair** |  | | | | |
| Office location: | | | | |
| Mobile: ; e-mail: | | | | |
| Consultation Hours: | | | | |
| **Instructor/Tutor** |  | | | | |
| Office location: | | | | |
| Mobile: ; e-mail: | | | | |
| Consultation Hours: | | | | |
| **ECTS Credits (CP)** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Lecture days, Hours and Room:** |  | | | | |
| **Tutorial/Lab days and Hours** |  | | | | |
| **Target Group:** | 1st year Information Technology Students | | | | |
| **Year /Semester** | Year: I, Semester: II | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | The course aims to help students gain experience and confidence with concepts of computer programming that will allow them to solve meaningful problems in a variety of fields. Basic ideas of computer and software architecture will be covered along with programming concepts such as flow, logic, data structures, and modularity. The core emphasis of the course is on the following: 1) Programming Concepts – recognizing and understanding the fundamental constructs present in all programming languages; 2) Design Methodology – Using abstraction to simplify complex problems into concrete subtasks; 3) Algorithmic Thinking – Defining the process used to glean information from data, and being able to convince oneself of its correctness; 4) Literate Programming – Writing programs which are clearly structured and can be read by a human as well as a machine; 5) Methodical and efficient development of computer programs using step-wise refinement and incremental testing and debugging | | | | |
| **Course Objective** | On completion of this course, students should be able to:   * fully understand the software development life cycle   + Discuss the importance of algorithms in the problem-solving process.   + Design algorithms for solving simple problems.   + Use pseudocode or a programming language to implement, test, and debug algorithms for solving simple problems.   + Describe strategies that are useful in program debugging.   + Understand and explain the behavior of simple programs involving the fundamental programming constructs.   + Modify and expand short programs that use standard conditional control structures and functions.   + Design, implement, test, and debug a program | | | | |
| **Course Outline** | **Chapter one**  **Problem solving using computers**   * Computer Fundamentals * Programming Languages * Identifying and Analyzing problems * Software Crisis * Software development method (Problem Definition, Requirement analysis, Design (algorithm, Flow charts, Pseudo codes), Coding, Testing & Maintenance, Documentation.   **Chapter two**  **Fundamentals of the C/C++ Programming Language**   * A brief history of C/C++ * Procedural and Object-Oriented Programming * C++ and Object-Oriented Programming * The structure of C++ Programs * Compilation process of C++ * A simple C++ program * Input/Output in C++ * Comments in C++   **Chapter three**  **Constants, Variables, data Types and Operators**   * C++ tokens * Declaring a variable * Naming rules for variables * Basic data types * Assigning values to variables * Constants * Operators and operator precedence * Mathematical operators * Relational operators * Logical operators * Increment and decrement operators   **Chapter Four**  **Control Flow Statements (Selection and Repetition Statements)**   * Selection Statements * If * if…else * Nested if….else * switch * Repetition statements (loops) * for loop * while loop * do… while loop * Nested loops.   **Chapter five**  **Array and String**   * + one-dimensional array   + multi-dimensional array   + working with string   **Chapter six**  **Pointers in C++**  **Chapter seven**  **Function**    **Lab Contents:**   * Compilation process of C++ * Displaying message using cout * Declaring and initializing variables with different data types * Declaring constant identifiers and use in the program * Assigning values to variables * Accepting values from users through cin * Practicing operators and expressions * Practicing control structures (sequential, if, if…else, nested if… else, switch, for loop, while loop, do while loop and Nested loops) * Arrays, pointers and functions | | | | |
| **Assessment** | Assignments=15% ,Project work= 20 % ; Lab Exam =25% ; Final examination= 40% | | | | |
| **References:** | 1. Walter Savitch, “Problem solving with C++ - The Object of programming”, Menlo Park: Addison-Wesley, 1996. 2. Dietel&Dietel, “C How To Program”, Third Edition, Prentice – Hall, 2003 3. Robert Lafore, “The Waite Group’s programming Using Turbo C++” Techmedia, 1993 4. John R. Hubrard, “Fundamentals of Computing with C++,” Shuam’s Outline, 1997 5. Jess Liberry, “An Introduction to C++” 1995   Robert Lafore, “The Wait Group Object Oriented programming With C++” 1994 | | | | |

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| **--------------**  **----------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec2041 | | | | |
| **Course Title:** | Fundamentals of Programming II | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Basic programming | | | | |
| **Module Number** | 04 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: I | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course is designed for people with prior programming experience. The topics covered in this course are the fundamental concepts behind programming preparing students to learn advanced programming languages. Topics include basic logic constructs functions, array, pointers, file systems structures and structured programming statements. | | | | |
| **Course Objective** | At the end of the course students will be able to:  -Solve problems using procedural programming languages  -To know and use C++ programming language  -To know concepts of class in C++  -To get familiar with pointer and its application | | | | |
| **Course content** | Chapter one  Array and String   * + one-dimensional array   + multi-dimensional array   + working with string   Chapter Two  Pointers in C++  Chapter three  Function  Chapter Four  Fundamentals of Classes   * + Data Types   + User Created Data Types   + Using The Class Concept   + Defining a class   + public and private Access Levels   + The Scope Resolution Operator ::   + public and private Access Levels (again)   + Using classObjCP Like Built-in Types   + Scope   + Constructors   + Member Initialization Lists   + Destructors   + Array of ObjCP   + Pointers   + The this Pointer   + Passing ObjCP To Functions   + Returning ObjCP From Functions   + static Class Members   Chapter Five  Operator Overloading   * + Introduction   + Rules for Operator Overloading   + Rationale for Operator Overloading   + Overloading Member Functions   + Overloading Non-Member Functions   + friend Functions   + The copy Constructor   + The Assignment Operator   + Overloading [ ]   + Overloading Increment and Decrement Operators   + constObjCP and References   Chapter Six  I/O   * + The iostream Library   + Predefined Streams   + operator<<   + Overloading << for User-Defined Classes   + Overloading >> for User-Defined Classes   + Manipulators   + Stream States   + Formatted I/O   + Disk Files   + Internal Transmission of Data   + Reading & Writing ObjCP   Chapter seven  Advanced Topics   * + - Template Functions     - Template Classes     - Multiple Inheritance     - User-Defined Conversions     - Data Structures     - An Iterator Class     - Exceptions | | | | |
| **Lab content** | * Arrays and string * Pointers * Functions * Classes * constructors * lists * public and private access method * destructor * array of object * passing objCP to functions * Overloading increment and decrement operators * I/O and files * User defined classes * Advanced topics   Template and exceptions | | | | |
| **Assessment** | As per University Legislative | | | | |
| **References** | 1. Walter Savitch, “Problem solving with C++ - The Object of programming”, Menlo Park: Addison-Wesley, 1996. 2. Dietel&Dietel, “C How To Program”, Third Edition, Prentice – Hall, 2003 3. Robert Lafore, “The Waite Group’s programming Using Turbo C++” Techmedia, 1993 4. John R. Hubrard, “Fundamentals of Computing with C++,” Shuam’s Outline, 1997 5. Jess Liberry, “An Introduction to C++” 1995   Robert Lafore, “The Wait Group Object Oriented programming With C++” 1994 | | | | |

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| **--------------**  **----------------------**  **Information Technology Program** | | |
| **Module Number** | **05** | |
| **Module Name** | **Advanced Programming** | |
| **Module CP** | **15** | |
| **Mode of Delivery** | **Parallel** | |
| **Module Competences** | * The students will have the basic knowledge of analyzing a variety of problems and generate appropriate algorithmic solutions and explore the syntax and semantics of programming language fundamentals. In addition they will understand and implement varieties of algorism analysis and implementation techniques. Moreover the students will develop the skills in identifying and analyzing classes, relationship between classes and implement using programming languages and apply Rapid Application Development and visual programming concepts and tools | |
| **Module Description** | * This module covers analysis ,Advanced sorting and searching and Time complexity of known algorithms; Data structures and applications ; Multithreading; Client/Server Interaction With Stream Socket Connection; Java Database connectivity with JDBC; Servlets and Java Server Pages * The .NET Platform and Its Architecture; Object-Oriented Fundamentals in VB.NET; Exception Handling; Manipulating Files Database Programming; Packages and Interfaces; Threads ;Remote Method Invocation | |
| **Module Objectives** | * An ability to design, implement, and evaluate a computer program to meet desired needs * An ability to use current techniques, skills, and tools necessary for computer programming * An ability to apply knowledge of computing and mathematics appropriate to computer programming | |
| ***Courses in the Module*** | | |
| **Course Code** | **Course Name** | **CP** |
| ITec2052 | Data structure and Algorithms | 5 |
| ITec3051 | Object Oriented Programming in Java | 5 |
| ITec3056 | Mobile application Development | 5 |
| ITec3054 | Event-Driven Programming | 5 |
| ITec3058 | Advanced Programming | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec2052 | | | | |
| **Course Title:** | Data structure and Algorithms | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | **Advanced Programming** | | | | |
| **Module Number** | **05** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 2nd Year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: II | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | The goal of the course is to give a basic understanding of how common computational problems can be solved efficiently on a computer. In general, the course teaches students how to write fast and efficient programs and enables them to analyze the efficiency of their programs. | | | | |
| **Course Objective** | At the end of this course the students will be able to know   * Use dynamic memory management in their programs * Implements linked lists, stacks, queues, trees, and graphs * Write programs that utilize complex data structures (lists, stacks, trees) * Analyze complexity algorithms * Integrate different modules to solve a single problem * Write fully functional programs that consists of multiple files | | | | |
| **Course Content** | Chapter One  Algorithm analysis concepts   * Measuring complexity, * complexity of algorithm * big-oh notation and others   Chapter Two  Time complexity of known algorithms   * Simple algorithms; Sorting and searching   Chapter Three  Data structures and applications   * Linked lists * Queues * Stacks * Trees * Graphs   Chapter Four  Advanced sorting and searching algorithms   * Shell sort * Quick sort * Heap sort * Merge sort   Chapter Five  Hashing | | | | |
| **Lab content** | * Function and array revision * Simple searching and sorting algorithm * Linked list, Queue, Stack, Trees * Advanced sorting and searching algorithm | | | | |
| Assessment Methods: | As per University Legislative | | | | |
| **References** | * Algorithms and Data Structures: The Science of Computing by Baldwin/Scragg. Charles River Media. 2004. * MichaelT.GoodrichandRobertoTamassia,“DataStructuresandAlgorithmsinJava”Wiley. | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec3051 | | | | |
| **Course Title:** | Object Oriented Programming in Java | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Advanced programming | | | | |
| **Module No.** | 05 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: III, Semester: I | | | | |
| **Pre-requisites** | ITec2041 | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This programming course emphasizes the methodology of programming from an object-oriented perspective and software engineering principles. It allows students to develop the ability to analyses programming problems and design and document suitable solutions and to implement reliable and robust software using contemporary program design methods. Topics to be dealt with are: classes: data abstraction, information hiding, overloading; inheritance; polymorphism; exceptions handling. | | | | |
| **Course Objectives** | Upon successful completion of the course, students will be able to:   * Explain the basic object oriented concepts * Successfully code, debug and run programs with appropriate development environment * Work on more advanced programs written in Java * Have clear differentiation between structural and object oriented programming paradigms | | | | |
| **Course contents** | **Chapter One: Introduction to Object-Oriented Programming**   * 1. Types of programming paradigm   2. Overview of OO principles   3. Overview of Java Programming and types of Java Program      1. Definition of Java Application, Java Applets      2. Editing, Compiling and Interpreting   **Chapter Two: Basics in Java Programming**   * 1. Variable types and identifiers   2. Number types, strings, constants   3. Operators and operator precedence   4. Type Conversion/ Casting   5. Decision and Repetition Statements      1. If statement, Switch statement   6. Iteration Statement      1. For loop, While, Do while loop   7. Arrays and working with arrays   **Chapter Three: Objects and Classes**   * 1. Object variables   2. Defining a class   3. Instantiating and using objects   4. Instance fields, Construction and methods   5. Private and Public data   **Chapter Four: OOP Concepts**   * 1. Encapsulation   2. Inheritance, Method overloading and overriding   3. Polymorphism   4. Abstract classes and Interfaces   **Chapter Five: Exception Handling**   * 1. Exception handling overview   2. Syntax   **Chapter Six: GUI & Java Applets**  6.1. Basic GUIs  6.2. Overview of Java Applets  6.3. Java Applets Vs Java Application  6.4. Running applets | | | | |
| **Lab Content** |  | | | | |
| Assessment Methods: | As per University Legislative | | | | |
| **References:** | 1. Deitel , Java How to Program. 8th ed. Prentice Hall 2. Eckel, Bruce. Thinking in Java. 4th ed. New Jersey: Prentice Hall 3. Java, Java, Java : Object oriented problem solving / R. Morelli and R. Walde. 3rd ed. 4. Core Java, Volume I-Fundamentals, CAY S. HORSTMANN& GRAY CORNELL, The Sun Microsystems Press, Java Series, 2001. | | | | |

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| **--------------**  **----------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec3054 | | | | |
| **Course Title:** | Event-Driven Programming | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Advanced programming | | | | |
| **Module No.** | 05 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 3rd year Information Technology students | | | | |
| **Year /Semester** | Year III, semester I | | | | |
| **Pre-requisites** | ITec2052 | | | | |
| **Status of the Course** | Core | | | | |
| **Course description** | This is a course in event-driven programming building on prior programming experience. The course covers topics in control arrays, exception handling, and the use of properties, controls, and multiple forms.  Introduces database manipulation and database controls, including use of database linking and programming applications to display, edit, and update databases by use of the data access object. This course uses advanced programming tools such as Visual Studio .Net. | | | | |
| **Course objective** | Upon successful completion of the course, the student should be able to:   * Demonstrate knowledge of a high-level object oriented programming language. * Demonstrate use of data types in program and systems development. * Demonstrate knowledge of event-driven programming and systems development. * Develop well-organized, block-structured, easily read programs. * Demonstrate ability to design graphical user interfaces (GUI). * Demonstrate ability to code arithmetic instructions, conditional statements, repetition structures, sub procedures, and control arrays in programs. * Demonstrate ability to develop programming applications to manipulate databases (including query, display, edit, update functions). * Demonstrate ability to develop integrated multiform programs. * Develop appropriate testing procedures and documentation for programs * To acquaint the student with computer problem solving using a visual development environment through the assignment of a variety of problems requiring solution development, program implementation, and documentation. | | | | |
| **Course content** | **Chapter 1: Introduction**   * Introduction to Software Development * Software Development Approaches * Rapid Application Development * Software Development Principles   **Chapter 2: Introduction to .NET**   * The .NET Platform and Its Architecture   + - * Base Class Library       * Common Language Runtime * Uses of .NET Platform in Application Development * Introduction to Microsoft Visual Studio 2010   + - * SDI and MDI Forms       * Controls   **Chapter 3: Object-Oriented Fundamentals in VB.NET**   * Language Fundamentals   + - * Variables and Data Types       * Control Flow       * Methods and Their Types       * Events * Classes and ObjCP * Inheritance and Overloading Implementation * Classes Versus Components   **Chapter 4: Exception Handling**   * Introducing Exception Handling * Structured Exception Handling * Implementing Exception Handling   **Chapter 5: Manipulating Files**   * How to open a Text File * Read a file line by line in VB .NET * Write to a Text File * [How to Copy, Move and Delete a File](http://www.homeandlearn.co.uk/csharp/csharp_s11p4.html)   **Chapter 6: Database Programming**   * The ADO.NET Architecture * LINQ Architecture * The .NET Data providers * Working with the common .NET Data providers * The Dataset Component * Using the DataGridView for database access | | | | |
| **Lab content** | * Event driven programming language * Variable declaration and data type operators and expressions * Loops and its declaration * Function declaration and usage * Arrays * Error handling * Opening DB and query DB * Graphics | | | | |
| Assessment Methods: | As per University Legislative | | | | |
| **Reference** | * An introduction to programming using visual basic 6.0, fourth edition, David I. Schneider * Evjen, B *et al*, (2008). ***Professional Visual Basic 2008***. CrosspointBoulevard:Wiley Publishing Inc. * Gary Cornell and Jonathan Morrison (2002). ***Programming VB.NET: A Guide for Experienced Programmers***. USA: APress * Cameron Wakefield, Henk-Evert Sonder and Wei Meng Lee. ***VB.NET Developers Guide***. USA: Syngress Publishing, Inc. | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec3058 | | | | |
| **Course Title:** | Advanced programming | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Advanced programming | | | | |
| **Module No.** | 05 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: III, Semester: II | | | | |
| **Pre-requisites** | ITec3051 | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | The goal of the course is to give a basic of class; data members &member functions; friends, static members, overloading; inheritance &composition; virtual functions; virtual base classes; templates; exception handling; File handling; object-oriented design concepts. | | | | |
| **Course Objectives** | Upon completion of this course, students should be able to:   * Create Java technology applications that leverage the object-oriented features of the Java language, such as encapsulation, inheritance, and polymorphism * Execute and run a Java technology application * Use Java technology data types and expressions * Use Java technology flow control constructs * Use arrays and other data collections * Implement error-handling techniques using exception handling * Create event-driven GUI using Java technology GUI components: panels, buttons, labels, text fields, and text areas * Create multithreaded programs * Create JDBC applications | | | | |
| **Course contents** | **Chapter One: Multithreading**   * + Introduction   + Thread States: Life Cycle of a Thread   + Thread priority and thread scheduling   + Creating and executing threads   + Thread synchronization   + Producer /Consumer relationship without synchronization   + Producer /Consumer relationship with synchronization   + Producer /Consumer relationship: Circular Buffer   + Daemon Threads   + Runnable Interfaces   **Chapter Two: Networking**   * + Introduction   + Manipulating a File on a Web Server   + Establishing a Simple Server Using Stream Sockets   + Establishing a Simple Client Using Stream Sockets   + Client/Server Interaction With Stream Socket Connection   + Connectionless Client/Server Interaction With Datagram   + Security and The Network   **Chapter Three: Java Database connectivity with JDBC**   * + Introduction   + Relational Database   + SQL   + Creating Database   + Manipulating Database with JDBC   + Stored Procedures   **Chapter Four: Servlets**   * + Introduction   + Servlet Overview and Architecture   + Handling HTTP get Request   + Handling HTTP get Requests Containing Data   + Handling HTTP post request   + Redirecting Requests to Other Resources   + Multi-Tier Applications: Using JDBC from a Servlet   **Chapter five: Java Server Pages**   * + Introduction   + Java Server Pages Overview   + First Java Server Page Examples   + Implicit ObjCP   + Scripting   + Standard Action   + Directives   **Chapter six: Java Collections**   * Set (Hash set and Tree set) * List (Array list and Linked list) * Map (Hash map and Tree map) * Sorting   **Chapter Seven: Java Beans** | | | | |
| **Lab Content** |  | | | | |
| Assessment Methods: | As per University Legislative | | | | |
| **References:** | 1. Java, How to Program,5th Edition, H.M.Deitel and P.J.Deitel,New Delhi,2004.   2. James Mc. Govern, “Java 2”, Hungry Minds Inc.  3. E.Balagurusamy “Programming with Java 2”, Tata Mc. Graw Hill, India.  4. Core Java, Volume I-Fundamentals, CAY S. HORSTMANN&GRAY CORNELL, The Sun Microsystems Press, Java Series, 2001. | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | |
| **Module Number** | **ITec-M1061** | |
| **Module Name** | **System Development and Project Management** | |
| **Total CP of the module** | **10** | |
| **Mode of Delivery** | **Parallel** | |
| **Module Competences** | * The students are expected to apply the structural systems analysis and design concepts, fact finding techniques and describe the information systems development life cycles (SDLC). They will demonstrate the object-oriented system analysis and design concepts, tools, techniques, and make themselves familiar with a range of standards, techniques and tools developed to support software project management and the production of high quality software. | |
| **Module Description** | * This module covers the three main courses namely Structured Analysis and Design, Object-oriented Analysis and Design, and IT Project Management. Topics includes the foundations of system development, system planning, structured system analysis, design, implementation and testing, It then continue with the object-oriented as a new software paradigm, gathering user requirements , object-oriented analysis, design, implementation and testing. Finally, topics on IT project management which includes Project Planning, scheduling, cost management, quality management, risk management and Procurement Management | |
| **Module Objectives** | * At the end of the module students will be able to: * Understand structural system analysis and design concept * Understand the different techniques that help to describe the information system development life cycle * Have a sound back ground in object-oriented system analysis and design concepts * understand a range of standards, techniques and tools developed to support software project management and the production of high quality software | |
| **Courses in the Module** | | |
| **Course Code** | **Course Name** | **CP** |
| **ITec3061** | Systems Analysis and Design | 5 |
| **ITec3062** | Information Technology Project Management | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | | | |
| **Program** | Information Technology | | | | | | |
| **Course Code** | ITec3061 | | | | | | |
| **Course Title:** | System Analysis and Design | | | | | | |
| **Degree Program** | Information Technology | | | | | | |
| **Module Name** | System Development and Project Management | | | | | | |
| **Module Number** | 06 | | | | | | |
| **CP Credits (CP)** | 5 | | | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | | | **Total** |
| 2 | 0 | 3 | 5 | | | 10 |
| **Target Group:** | 3rd Year Information Technology Students | | | | | | |
| **Year /Semester** | Year: III, Semester: I | | | | | | |
| **Pre-requisites** |  | | | | | | |
| **Status of the Course** | Core | | | | | | |
| **Course Description** | This course will explore the Introduction to Object Technology; Principles of Modeling, Principles of Object Orientation; systems development using the object technology; Modeling; principles of modeling; requirements gathering and modeling using use case; techniques of modeling static and dynamic aspCP of systems; finding classes and objCP; Interaction Diagrams - sequence and collaboration diagrams; Class Diagrams; object diagram; activity diagram; Statechart diagrams; component diagram; deployment diagram. Individual and/or team project involving reports and walk-through in systems analysis and design is also a major component of this course using CASE tools. | | | | | | |
| **Course Objectives** | At the end of the course students will be able to:   * Understand the object technology and modeling principles. * Know the techniques of modeling aspect of systems * Analyze user requirements using UML of OO techniques. * Make a detailed design using UML of OO techniques. | | | | | | |
| Content | | | | | Period | Reference book | |
| Chapter 1: System Development Life Cycle   * What is system? * System Components * Systems Panning and Selection   + Identifying and selecting Systems Development project   + Initiating and Planning Systems Development project   + Structuring System Process Requirements   + Structuring system Logic Requirements   + Structuring System data Requirements * Overview of Structural Paradigm | | | | | Week 1 and 2 |  | |
| Chapter 2: System design   * + Designing databases     - Logical Database Design     - Physical Database Design     - Normalization   + Designing the human interface     - Interface Prototype | | | | | Week 3 |  | |
| Chapter 3: Systems implementation and Maintenance   * + System implementation   + Systems Maintaining information systems | | | | | Week 4 |  | |
| Chapter 4: Understanding the Basics: Object oriented concepts   * + OO concepts from structured point of view   + Abstraction, Encapsulation and information hiding   + inheritance   + Association   + Aggregation   + Collaboration   + Persistence   + Coupling   + Cohesion   + polymorphism   + Interfaces   + components   + Patterns | | | | | Week 5 and 6 | Object Primer Scott Ambler 2nd Edition  Pp 133-180 | |
| Chapter 5: Object Orientation the new software paradigm   * + The potential benefits of object orientation   + The potential drawbacks of object orientation   + Object standards   + The object orientation software process | | | | | Week 7 and 8 | Object Primer Scott Ambler 2nd Edition  pp 9-30 | |
| Chapter 6: Gathering user requirements   * + Putting together requirements gathering team   + Fundamental requirements gathering techniques   + Essential Use Case Modeling   + Essential User Interface Prototyping   + Domain modeling with class responsibility collaborator (CRC) cards   + Developing a supplementary Specification   + Identifying Change Cases | | | | | Week 9  Week 10 | Object Primer Scott Ambler 2nd Edition  pp 31-108 | |
| Chapter 7:Ensuring Your Requirements Are correct: Requirement validation Techniques   * + Testing Early and Often   + Use Case Scenario Testing | | | | | Week 11 | Object Primer Scott Ambler 2nd Edition  Pp109 -132 | |
| Chapter 8: Determining What to Build: OO Analysis   * + System Use Case Modeling   + Sequence Diagrams: From Use Cases to Classes   + Conceptual Modeling: Class diagrams   + Activity diagramming   + User interface prototyping Evolving your supplementary specification   + Applying Analysis patterns Effectively   + User Documentation   + Organizing your models with packages | | | | | Week 12 and 13 | Object Primer Scott Ambler 2nd Edition  Pp 181-248 | |
| Chapter 9: Determining How to Build Your System: OO Design   * + Layering your models: Class Type Architecture   + Class Modeling   + Applying Design Patterns Effectively   + State chart modeling   + Collaboration Modeling   + Component Modeling   + Deployment Modeling   + Rational Persistence Modeling   + User Interface Design | | | | | Week 14 and 15 | Object Primer Scott Ambler 2nd Edition  Pp 249-346 | |
| **Methodology**  The course will be delivered in lectures (with a participatory approach) - students are encouraged to ask questions and also they are encouraged to answer whenever questions are raised), present their assignments in the class and actively participate in the tutorial program.  **Assessment Method:**  As per University Legislative  **Text book**   * Ambler, S. W. (2001).The *Object primer: The Application Developer’s Guideto Object Orientation and the UML Second edition* .New York. Cambridge University Press   **References**   * **Booch G., (2000).**Object oriented analysis and design with applications, Second Edition, Pearson Education,Inc. * **Hoffer J.,George J. ,Valacich J. . (2008).** Modern Systems Analalysis and Design. 5th Edition. Pearson Education. * **Subburaj R. (2003).**Object Oriented with C++ ANSI/ISO Standard.Vikas Publishing House PVT LTD. * **Priestley M**. (2003).Practical Object oriented Design with UML. second Edition McGraw-Hill Education. | | | | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | | |
| **Program** | Information Technology | | | | | |
| **Course Code** | ITec3062 | | | | | |
| **Course Title:** | Information Technology Project Management | | | | | |
| **Degree Program** | Information Technology | | | | | |
| **Module Name** | System Development and Project Management | | | | | |
| **Module Number** | 06 | | | | | |
| **CP Credits (CP)** | 5 | | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** | |
| 2 | 3 | 0 | 5 | 10 | |
| **Target Group:** | 3rd Year Information Technology Students | | | | | |
| **Year /Semester** | Year: III, Semester: II | | | | | |
| **Pre-requisites** |  | | | | | |
| **Status of the Course** | Core | | | | | |
|  | **Course Outline** | | | | | |
| **Course Description** | This course will introduce the area of Information Technology project management, presenting basic techniques and approaches and aiming to develop a critical awareness of the challenges and shortcomings of the area. IT Project Management is an important area of study since most non-trivial software development efforts will be make use of some type of project management approach in an aim to manage the development process in such a way that the software meets its requirements and is on-time and within budget. | | | | | |
| **Course Objectives** | At the end of the course students will be able to:   * Understand the issues involved in IT project management and the factors that affect software quality; * Familiar with a range of standards, techniques and tools developed to support IT project management and the production of high quality software; * Develop IT project plans, supporting software quality plans and risk management plans. * Capable of actively participating or successfully managing a software development project by applying project management concepts * Demonstrate knowledge of project management terms and techniques | | | | | |
| **Course Content** | **Lecture Topics** | | | | | **Reading/**  **Assignments** |
| 1) Introduction to IT Project Management  1.1. Importance of IT project management  1.1.1 What is a project?  1.1.2 Problems with IS Project  1.1.3 What is Project Management?  1.2. Stages of Project  1.2.1. The Feasibility Study  1.2.1.1 The Cost-benefit Analysis  1.2.2. Planning  1.2.3. Project Execution  1.2.4 Project and Product Life Cycles  1.3. The Stakeholder of a Project  1.3.1 All parties of a project  1.3.2 The Role of Project Manager  1.4. Project Management Framework  1.5. Software Tools for Project Management | | | | | R1 pp 4-11  R1 pp 12-28  R1 pp29-38  R1 pp39-50  R1 pp51-64 |
| 2) Project Planning  2.1. Integration Management  2.1.1 What is Integration Management  2.1.2. Project Plan Development  2.1.3. Plan Execution  2.2 Scope Management  2.2.1 What is Scope Management?  2.2.2 Methods for Selecting ProjCP  2.2.3 Project Charter  2.2.4 Scope Statement  2.2.5 Work Breakdown Structure  2.3 Stepwise Project Planning  2.3.1 Overview of Project Planning  2.3.2 Main Steps in Project Planning | | | | | **Reading:**  R1 pp65-82 |
| 3) Project Scheduling  3.1 Time Management  3.1.1. Importance of Project Schedules  3.1.2. Schedules and Activities  3.1.3. Sequencing and Scheduling Activity  3.2. Project Network Diagrams | | | | | **Reading:**  R1 pp83-94 |
|  | | | | |  |
| 4) Project Cost Management  4.1. Importance and Principles of Project Cost Management  4.2. Resource Planning  4.3. Cost Estimating  4.4. Cost Budgeting   * 1. Cost Control | | | | | **Reading:**  R1 pp95-106 |
| 5) Project Quality Management  5.1 Quality of IT ProjCP  5.2 Stages of IT Quality Management  5.2.1 Quality Planning  5.2.2 Quality Assurance  5.2.3 Quality Control  5.3 Quality Standards   * 1. Tools and Techniques For Quality Control | | | | | **Reading:**  R1 pp107-116 |
| 6) Project Human Resources Management  6.1. What is Project Human Resources Management?  6.2 Managing People  6.3. Organizational Planning  6.4. Issues in Project Staff Acquisition and Team Development | | | | | **Reading:**  R1 pp117-126 |
| 7) Project Communication Management  7.1. Communications Planning  7.2. Information Distribution  7.3. Performance Reporting  7.4. Administrative Closure  7.5. Suggestions for Improving Project communications | | | | | **Reading:**  R1 pp127-146 |
| 8) Project Risk Management  8.1. The Importance of Project Risk Management  8.2. Common Sources of Risk in IS projCP  8.3. Risk Identification  8.4. Risk Quantification  8.5. Risk Response Development and Control | | | | | **Reading:**  R1 pp147-160 |
| 9) Project Procurèrent Management  9.1. Importance of Project Procurèrent Management  9.2. Procurèrent Planning  9.3. Sollicitation  9.4. Source Selection  9.5. Contract Administration  9.6. Contract Close-out | | | | | **Reading:**  R1 pp1-30 |
| 10) Project Management Process Groups  10.1 Introduction to Project Management Process Groups  10.2. Project Initiation  10.3. Project Planning  10.4. Project Executing  10.5. Project Controlling and Configuration Management  10.6. Project Closing | | | | | **Reading:**  R1 pp 4-11  R1 pp 12-28  R1 pp29-38 |
| **Methodology**  Three lecture hours are scheduled per week for this course. These hours are fully used to lecture the course. Students will be asked to read certain topics on their own before a class discussion. As part of this course’s assignment the class will be divided into groups. At the end of the course, each group in the class is supposed to do assignments and present it in class.The delivery of the project is subjected to deadline. No extensions will normally be granted for the deadline.  There will be midterm exam for this course. Final examination will be given on the dates specified by the University. The examinations will focus on understanding and applying the concepts taught in class and in tutorial sessions of the course. The following topic deals with the details of the assessment methods of the course.  **Assessment**  As per University Legislative  **Reference books**   * A Guide to the Project Management Body of Knowledge, Project Management Institute, Pennsylvania, USA (2000) * “Information Technology Project Management” Kathy Schwalbe, International Student Edition, THOMSON Course Technology, 2003 * Basics of Software Project Management, NIIT, Prentice-Hall India, 2004 * Software Project Management in Practice, PankajJalote, Pearson Education, 2002 * Software Project Management, A Concise Study, S.A.Kelkar, Revised Edition, Prentice-Hall India, 2003 | | | | | | |

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| **--------------**  **------------------**  **Information Technology Program** | | |
| **Module Number** | **ITec-M2071** | |
| **Module Name** | **Database Systems** | |
| **Total CP of the module** | **10** | |
| **Mode of delivery** | **Parallel** | |
| **Module competency** | * The module enables students in understanding of the different database models, distributed database system in homogenous and heterogeneous environments and the basic principles of database design systems using different database models. They will also design and create databases, tables, views, triggers and indices and write SQL queries and database programs. | |
| **Module Description** | * This module covers two courses namely Fundamentals of Database Systems and Advance database systems. Topics includes Introduction to database and database architecture, database modeling and Entity-relationship diagram/modeling, normalization and Basic Structured Query Language(SQL), relational algebra. It then continue with advance database concepts with topics includes Query processing and optimization, Database security and authorization, transaction processing and concurrency control techniques, database recovery, distributed databases, and new technologies in database. | |
| **Objective of the module** | The objectives of the module are:   * Develop an understanding of the different database models * Understand the basic principles of database design systems using different database models * The student design and create databases, tables, views, triggers and indices. * Write SQL queries and database programs * Design a distributed database system in homogenous and heterogeneous environments | |
| **Courses in the Module** | | |
| **Course Code** | **Course Name** | **CP** |
| **ITec2071** | Fundamentals of Database Systems | 5 |
| **ITec3071** | Advanced Database Systems | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec2071 | | | | |
| **Course Title:** | Fundamentals of database Systems | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | **Database Systems** | | | | |
| **Module Number** | 07 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 2nd Year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: I | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course covers basic concepts behind database systems. It presents methodology for conceptual, logical, and physical database design for relational systems and its language (Structured Query Language). The course also examines distributed database management systems and object-oriented database management systems | | | | |
| **Course Objective** | Upon successful completion of the course, the student is expected to be able to:   * Understand the basic principles of database design systems using different database models * Differentiate database from file system * Design different types of databases * Create database tables, views, and indices * Write SQL queries and database programs | | | | |

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| **Course outline** | **Chapter 1: Introduction**   * Database * Data management approach * Components of DBMS * Functions of DBMS * Database Development Lifecycle * Roles in database design environment (DBA, DBD user.) * The ANSI-SPARC Architecture * Database Languages (DDL, DML,DCL) * Data models |
| **Chapter 2: Relational Model**   * Relational Constraints * Relational Integrity * Key constraints * Referential constraints |
| **Chapter 3: Conceptual Database Design – E-R modeling**   * Basic concepts of E-R model * Structural constraints   + - Cardinality constraints     - Participation constraints * Problem with E-R models * Enhanced E-R models |
| **Chapter 4: Logical Database Design**   * Normalization * Functional dependencies * Process of normalization (1NF, 2NF, 3NF) |
| **Chapter 5: Physical Database Design**   * Physical database design process * Database design and implementation for relational databases |
| **Chapter 6: Query Languages**   * Relational Algebra * Relational calculus |
| **Chapter 7: Advanced Database Concepts**   * Integrity * Data security * Client-server systems * Distributed Database Systems * Data warehousing and data Mining |
| **Assessment** | As per University Legislative |
| **Reference** | **Text Book**  Elmasri, et al (2011). Fundamentals of Database Systems, 6thed, Pearson education  References   1. David M. Kroenke. (1998). Database processing, 6th ed. Prentice Hall 2. Introduction to Database systems, C.J.DATE 3. Navathe, E(2000). Fundamentals of database Systems. 3rd ed. Delhi, Pearson Education 4. Ramon A , etal. Shaum’s outlines, fundamentals of relational databases 5. Silbershatz A. Korth H &Sundarshan (2006). Database System concepts, 5th ed. Boston, McGraw Hill 6. Thomas M. Connolly and Carolyn E.Begg (2004). A step by step approach to building databases, 2nded.Pearson Education Limited. |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec3071 | | | | |
| **Course Title:** | Advanced Database Management | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Database systems | | | | |
| **Module Number** | 07 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: III, Semester: I | | | | |
| **Pre-requisites** | ITec2071 | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course covers file organizations, storage management, query optimization, transaction management, recovery, and concurrency control, database authorization and security. Additional topics include distributed databases, mobile databases, and integration may also be covered. A major component of the course is a database implementation project using current database languages and systems. | | | | |
| **Course Objectives** | At the end of this course the students will be able to:   * Understand the database query processing and optimization * Know the basics of transaction management * Understand database security * Use different recovery methods when there is a database failure * Design a distributed database system in homogenous and heterogeneous environments | | | | |
| **Course outline** | Brief introduction about the course  **Chapter 1:** **Query processing and Optimization**   * Translating SQL Queries into Relational Algebra * Basic Algorithms for Executing Query Operations * Using Heuristic in Query Optimization * Using Selectivity and Cost Estimates in Query Optimization * Semantic Query Optimization   **Chapter 2: Database Security and**  **Authorization**   * Introduction to DB Security Issues * Discretionary Access Control Based on Granting /Revoking of Privileges * Mandatory Access Control for Multilevel Security * Statistical DB Security   **Chapter 3: Transaction Processing Concepts**   * Introduction * Transaction and System Concepts * Properties of Transaction * Schedules and Recoverability * Serializability of Schedules * Transaction Support in SQL   **Chapter 4: Concurrency Control Techniques**   * Locking Techniques for Concurrency Control * Concurrency Control Based ON Timestamp Ordering * Multiversion Concurrency Control Techniques * Validation (Optimistic) Concurrency Control Technique * Granularity of Data Items and Multiple Granularity Locking * Using Locks for Concurrency Control in Indexes   **Chapter 5: Database Recovery Techniques**   * Recovery Concepts * Recovery Concepts Based on Deferred Update * Recovery Concepts Based on Immediate Update * Shadow Paging * The ARIES Recovery Algorithm * Recovery in Multidatabase Systems   **Chapter 6: Distributed Database System**   * Distributed Database Concepts * Data Fragmentation, Replication, and Allocation Techniques for Distributed database Design * Types of Distributed Database Systems * Query Processing in Distributed Databases * An over view of Client- Server Architecture and its Relationship to Distributed database | | | | |
| **Assessment** | As per University Legislative | | | | |
| **Reference** | **Text Book**  Elmasri et al (2011). Fundamentals of Database Systems, 6thed, Pearson education  **References**   1. Thomas M. Connolly and Carolyn E.Begg. (2004). A step by step approach to building databases, 2nded.Pearson Education Limited. 2. Ramon A ,etal. Shaum’s outlines, fundamentals of relational databases 3. David M. Kroenke. (1998). Database processing, 6th ed. Prentice Hall 4. Van der Lans (2006). Introduction to SQL, Mastering the relational database language. 3rd ed. London, Addis Wesley 5. Silbershatz A. Korth H andSundarshan (2006). Database System concepts, 5th ed. Boston, McGraw Hill 6. RamaKrishman(1998). Database Management   Systems. Boston McGraw Hill   1. Namdagopalan (2003). Database Management Systems with oracle and vb.Gandhinagar, Appa Book house. 2. Date, .J (1981). An Introduction to Database systems. 3rd ed. Vol. 1. New Delhi. Narosa publishing House | | | | |

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| **--------------**  **---------------------------**  **Information Technology Program** | | |
| **Module Number** | **08** | |
| **Module Name** | Information Management | |
| **Total CP of the module** | **10** | |
| **Mode of delivery** | **Parallel** | |
| **Module competency** | * The module creates the basic understanding of various indexing, matching, organizing and evaluating strategies. | |
| **Module Description** | This module covers specifically the information storage and retrieval course. Topics includes introduction to ISR, Text/document operations and Automatic indexing, indexing structures, IR models, retrieval system evaluation, query language and operations, and finally current issues in ISR. | |
| **Objective of the module** | The objectives of the module are:   * To acquaint students with the various indexing, matching, organizing and evaluating strategies developed for information retrieval (IR) systems | |
| **Courses in the Module** | | |
| **Course Code** | **Course Name** | **CP** |
| **ITec3082** | Information Storage and Retrieval | 5 |
| **ITec3084** | GIS and Remote Sensing | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec3082 | | | | |
| **Course Title:** | Information Storage and Retrieval | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Information Management | | | | |
| **Module Number** | **08** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 3rd year Information Technology Students | | | | |
| **Year /Semester** | Year: III, Semester: II | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course will uncover introductory concepts of Information Storage and Retrieval; automatic text operation including automatic indexing; data and file structure for information retrieval; retrieval models; evaluation of information retrieval systems and techniques for enhancing retrieval effectiveness; query languages, query operations, string manipulation and search algorithms; Current Issues in IR etc. | | | | |
| **Course Objective** | At the end of the course students will be able to:   * Understand the various Information Retrieval Systems and processes * Know the retrieval model and evaluation of Information Retrieval Systems * Understand the processes of information storage and retrieval * Design ,develop and evaluate information retrieval models * Understand evaluation issues in IR * Understand current issues in IR | | | | |
| **Course Outline** | **Chapter One: Introduction to ISR**   * IR and IR systems * Data versus information retrieval * IR and the retrieval process * Basic structure of an IR system | | | | |
| **Chapter Two: Text/Document Operations and Automatic Indexing**   * Index term selection (Luhn’s selection and Zipf’s law in IR) * Document pre-processing (Lexical analysis, Stop word Elimination, stemming) * Term extraction (Term weighting and similarity measures) | | | | |
| **Chapter Three: Indexing Structures**   * Inverted files * Tries, Suffix Trees and Suffix Arrays * Signature files | | | | |
| **Chapter Four: IR Models**   * Introduction of IR Models * Boolean model * Vector space mode * Probabilistic model | | | | |
| **Chapter Five: Retrieval Evaluation**   * Evaluation of IR systems * Relevance judgment * Performance measures (Recall, Precision, etc.) | | | | |
| **Chapter Six: Query Languages**   * Keyword-based queries * Pattern matching * Structural queries | | | | |
| **Chapter Seven: Query Operations**   * Relevance feedback * Query expansion | | | | |
| **Chapter Eight: Current Issues in IR**   * Research in IR (Multimedia Retrieval, Web Retrieval, Question answering. etc.) | | | | |
| **Assessment** | As per University Legislative | | | | |
| **Reference** | **Text Book**   * Ricardo A. Baeza-Yates, Berthier Ribeiro-Neto, [Modern Information Retrieval](http://www.amazon.com/exec/obidos/ASIN/020139829X/o/qid=932566390/sr=2-2/002-6532988-1082651), ACM Press, 1999.   **Other Reference Books:**   * Salton, G. and McGill, M. J. Introduction to Modern Information Retrieval, McGraw-Hill Co., 1983. * Robert R. Korfhage, [Information Storage and Retrieval](http://www.amazon.com/exec/obidos/ASIN/0471143383/qid=932566587/sr=1-1/002-6532988-1082651), John Wiley and Sons, 1997. * C. J. Van Rijsbergen. Information retrieval. London: Butterworths, 1979.(available at: <http://www.dcs.gla.ac.uk/~iain/keith/>) * Information Retrieval: Data Structures and Algorithms by W. B. Frakesand R. Baeza-Yates (Eds.) (Prentice-Hall) 1992, ISBN 0-13-463837-9. * Spärck Jones, K. and Willett, P. (eds.). Readings in information retrieval. San Francisco: Morgan Kaufmann, 1997. | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec3084 | | | | |
| **Course Title:** | Geographic Information System(GIS) and Remote sensing | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Information Management | | | | |
| **Module No.** | 08 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 3rd year Information Technology Students | | | | |
| **Year /Semester** | Year III, semester II | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Major | | | | |
| **Course Description:**  To provide a broad overview of the design, development, and application of Geographic Information Systems (GIS) and to provide students with the knowledge to build and manage spatial databases and perform spatial analysis using database management systems (DBMS) and GIS tools and to introduce the basic concepts and the operational skills necessary to acquire the most appropriate Remote Sensing data and extract geo-information from them..  **Course Goals or Learning Outcomes:**  By the end of this course, students will be able to:   * Understand GIS and its application. * Describe geographic information , spatial data types * Explain the steps of spatial data handling * Learn DBMS and spatial referencing * Understand about data quality and measures of location errors on maps * Learn about satellite-based positioning ,spatial data input, data preparation and management * Understand analytical GIS capabilities, retrieval and classification * Understand the fundamentals of Remote Sensing * Learn about various types of sensors, platforms and RS data acquisition systems * Understand radiometric and geometric aspCP of remote sensing data. * Understand Image enhancement, visualization ,Image interpretation, classification * Learn Microwave thermal remote sensing ,Radar & Laser altimetry * Learn Remote sensing applications in GIS   **Prerequisites:**  ITec2071  **Assessment**  As per University Legislative  **References:**   * *GIS Fundamentals,* 2nd ed., P. Bolstad, Eider Press, Chrisman, N. (2002) * *Exploring Geographic Information Systems* John Wiley 2nd edition. * *An Introduction to Geographical Information Systems’* Second edition, Prentice Hall: Harlow. [ISBN:0130611980] * GIS Fundamentals, 2nd ed., Paul Bolstad, Eider Press * Getting Started with Geographic Information Systems, 4 th ed., K.C. Clarke, Prentice Hall Series * Exploring Geographic Information Systems, 2nd ed., N. Chrisman, Wiley. * *Remote Sensing – Methods and Applications.*Hord, R. Michael l. 1986.John Wiley & Sons.   **Summary of Teaching Learning Methods:**  The teaching –learning methodology is student-centered by the guidance of instructor/s during their activities .There will be Lectures, Demonstrations, Lab work, Tutorials, Reading assignments and Group Discussions. | | | | | |

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| **--------------**  **-----------------**  **Information Technology Program** | | | | | | | | |
| **Module Number** | | | **09** | | | | | |
| **Module Name** | | | Web Systems and Technologies | | | | | |
| **Total CP of the module** | | | **10** | | | | | |
| **Mode of delivery** | | | **Parallel** | | | | | |
| **Module competence** | | | The module enables students to acquire the skills of developing static and dynamic websites, in creating Server/client side scripts for commercial and scientific programs. In addition they will develop Web Server programming for different applications. They make themselves familiar with E-commerce implementation concepts and design network security enhanced applications. They will also have the ability to analyze a web based problems, identify and define the requirements appropriate to its solution, design, implement, and evaluate a web based program to meet desired needs and use current techniques, skills, and tools necessary for internet programming. | | | | | |
| **Module Description** | | | * This module covers three courses namely Fundamental of Internet Programming, Advance Internet Programming and E-Commerce technologies. Topics includes overview of internet technologies and protocols, HTML, Style Sheets, JavaScript, Using JavaScript on HTML forms, Server-side programming Introduction to server-side programming and server-side programming languages using PHP. It then continue on advance topics in internet programming which includes Server Side Scripting Basics, HTML Forms and Server Side Scripting, Files and Directories, Connecting to Databases, Cookies and Sessions and Introduction to CMS. Finally in E-commerce technologies with topics includes Overview of e-commerce, The E-commerce Business Models, software building blocks, Security and Cryptography, Electronic Commerce: Legal, Ethical, and Tax Issues, Online Auctions, Virtual Communities, and Web Portals And Electronic Commerce Software. | | | | | |
| **Objective of the module** | | | The objectives of the module are:   * To provide students with a working knowledge of Internet terminology and services including e-mail, WWW browsing, search engines, ftp, file compression, and other services using a variety of software packages. Provides instruction for basic server administration tasks related to Internet Service provision. | | | | | |
| **Courses in the Module** | | | | | | | | |
| **Course Code** | | | **Course Name** | | | | **CP** | |
| **ITec2092** | | | Internet Programming I | | | | 5 | |
| **ITec3091** | | | Internet Programming II | | | | 5 | |
| **Bahir Institute Technology**  **Faculty of Computing** | | | | | | | | |
| **Program** | Information Technology | | | | | | | |
| **Course Code** | ITec2092 | | | | | | | |
| **Course Title:** | Internet Programming I | | | | | | | |
| **Degree Program** | Information Technology | | | | | | | |
| **Module Name** | Web Systems and Technologies | | | | | | | |
| **Module code** | **ITec-M2091** | | | | | | | |
| **Course Chair** |  | | | | | | | |
| Office location: | | | | | | | |
| Mobile: ; e-mail: | | | | | | | |
| Consultation Hours: | | | | | | | |
| **Instructor/Tutor** |  | | | | | | | |
| Office location: | | | | | | | |
| Mobile: ; e-mail: | | | | | | | |
| Consultation Hours: | | | | | | | |
| **ECTS Credits (CP)** |  | | | | | | | |
| **Contact Hours** | **Lecture** | | | **Lab/Practical** | **Tutorial** | **Home Study** | | **Total** |
| 2 | | | 3 | 0 | 5 | | 10 |
| **Target Group:** | 2nd Year Information Technology Students | | | | | | | |
| **Year /Semester** | Year: II, Semester: II | | | | | | | |
| **Pre-requisites** |  | | | | | | | |
| **Status of course** | Core | | | | | | | |
| **COURSE DESCRIPTION** | Overview of Internet and World Wide Web Technology: Client-server architecture: Web server and security. HTTP Protocol; Web page design and development; information architecture and visualization; static and dynamic pages, client side programming using hypertext and scripting languages (HTML, JavaScript); server-side programming (PHP and Java); web-based database application development. Advanced Web applications and Web service development. In general this course addresses issues like: What is the basic architecture of the Internet? How does it really work? What is client-server architecture? What are the standards and protocols used in the communication? How do we develop web applications? What are client side and server side scripting paradigms? How to handle database communication, sessions and cookies? What are the available technologies and frameworks? | | | | | | | |
| **COURSE OBJECTIVES** | After completing this course the student shall be able to   * To understand web protocols , Design and development of static and dynamic pages * To develop an understanding of the technology and protocols underlying World Wide Web. * To become familiar with the common tools and techniques for developing Web-based applications, both client-side and server-side. * To develop a working knowledge of HTML, JavaScript, PHP, JSP and Servlets as languages for developing Web applications. * To become familiar with web-based database application development. * Use CSS on web pages * Use PHP for server side scripting and database connectivity | | | | | | | |
| **Course outline** | | Chapter 1: Internet Technologies and Protocols  1. Overview of the Internet  2. World Wide Web  3. Client-server architecture  4. How the Web works?  5. Hypertext Transfer Protocol (HTTP 1.0/HTTP 1.1/secure HTTP)  6. Other Web protocols (FTP, SMTP, ...)  7. Web content validation  8. Website evaluation (readability, layout, coloring, trust…)  Chapter 2: HTML  1. General concepts of Web design  2. Basics of HTML  3. HTML tags and their attributes  4. Text formatting with HTML and background changing  5. HTML frames implementations, pros and cons  6. Tables in HTML  **7.** Forms in html chapter 3:  **Style Sheets**  1. Adding style to HTML  2. types of CSS styles (Inline, Embedded, and External Style Sheets)  3. Cascading style sheets  4, Media-dependent cascades (Aural, screen, and print style sheets)  **Chapter4: JavaScript**  1. Introduction  2. Language Format  3. data types and primitive**s**  Functions in JavaScript  3. Assigns function to event  4. Sessions and cookies using JavaScript **Chapter 5:**  **Using JavaScript on HTML forms**  1. Form methods and properties  2. the DOM model(Window, Document, forms and elements )  3. Events (on submit() …..)  4. Interacting with form elements  **Chapter 6:Server-side programming Introduction to server-side programming and server- side programming languages**  1 web servers, execution engines, and their installation  2 Basics of PHP  3 PHP Pros and Cons  4 Setting up your environment(Directory structure, Error handling and Debugging) Elements of PHP  5 PHP variables and arrays 6 Control flow  7 Patterns for processing HTML forms  8 Understanding $\_GET, $\_POST, $\_SESSION and other PHP super-  arrays 9 Dynamically generating HTML  **Lab Contents:**   * Using internet * Cascading style sheet * Creating table, special character, links, lists * Using html tags, xml tags * Designing webpage, multimedia integrated with flash and adobe * Working server side scripting | | | | | | |
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| Assessment | | Assignments …………………………………15%  Quiz and test……….……………………….. 20%  Final examination ……………………………45%  Project and Lab Exercise ……………………20% | | | | | | |
| Reference | | 1. HTML, Black Book, by Holzner 2. JavaScript Bible 6th edition by Danny Goodman and Michael Morrison 3. PHP and MySQL Web development by Luke Welling and Laura Thomson 4. JavaScript for the World Wide Web by Tom Negrino and Dori Smith 5. PHP5 and MySQL Bible by Tim Converse and Joyce Park with Clark Morgan 6. The Internet and Its Protocols : A Comparative Approach (The Morgan Kaufmann Series in Networking) by Adrian Farrel 7. Computer Networking with Internet Protocols and Technology by William Stallings | | | | | | |

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| **University Name School/College/Faculty/Institute** | |
| **Program** | Information Technology |
| **Course Code** | ITec3093 |
| **Course Title:** | Internet Programming II |
| **Degree Program** | Information Technology |
| **Module Name** | Web Systems and Technologies |
| **Module Code** | ITec-M2091 |
| **Course Chair** |  |
| Office location: |
| Mobile: ; e-mail: |

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|  | | Consultation Hours: | | | | |
| **Instructor/Tutor** | |  | | | | |
| Office location: | | | | |
| Mobile: ; e-mail: | | | | |
| Consultation Hours: | | | | |
| **ECTS Credits (CP)** | | 5 | | | | |
| **Contact Hours** | | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 32 | 48 | 0 | 55 | 135 |
| **Target Group:** | | 3rd Year Information Technology Students | | | | |
| **Year /Semester** | | Year: III, Semester: I | | | | |
| **Pre-requisites** | | Internet Programming I | | | | |
| **Status of the Course** | | Core | | | | |
| **COURSE DESCRIPTION** | | This course is a continuation of Internet Programming. It deals with web application development using an enterprise application framework focusing on server side scripting. Topics offered include an introduction to basic syntax, the development environment, state management, eb controls, connecting web page to database, Web Services, security and design web page for E-commerce. | | | | |
| **Course objective** | | After completing this course the student shall be able to  Understand server side scripting  Develop web-based applications  Create Forms on Websites  Connect WebPages to databases  Design web page for e-commerce | | | | |
| **Course outline** | **Unit 1: Server Side Scripting Basics 1.1.Introduction to server-side scripting**  **1.2. Server-side scripting languages 1.3. Use Basic Syntax 1.4. Send Data to the Web Browser 1.5. Write Comments 1.6. Utilize Variables 1.7. Manipulate Strings 1.8. Manipulate Numbers**  **1.9 Work with constants**  **Unit 2: HTML Forms and Server-Side Scripting**  **2.1. Use Conditionals and Operators 2.2.Validate Form** | | | | | | |
| ~~107~~ | **2.3. Send Values to a Script Manually 2.4. Work with Forms and arrays of data**  **2.5. Use For and While Loops**  **2.7. Create a Simple Form using PHP**  **2.8. Use Get or Post**  **2.9. Receive Data from a Form in PHP 2.10. Introduction to regular expressions**  **Unit 3: Files and Directories**  **3.1. Write to Files**  **3.2. Read from Files 3.3. Create Directories**  **3.4. Upload Files**  **3.5.Rename and Delete Files and Directories**  **Unit 4: Connecting to Databases**  **4.1. Connect to an existing Database**  **4.2. Send Data to a Database**  **4.3. Retrieve Data from a Database**  **4.4. Modify Existing Data**  **4.5. Remove Existing Data**  **4.6. Data base security using server side scripting**  **Unit 5: Cookies and Sessions**  **5.1. Describe the stateless model**  **5.2. Explain the concepts of maintaining state with sessions**  **5.3. Create and Read data from sessions**  **5.4. Putting PHP session IDs in pages 5.5. Create and Read data from Cookies 5.6. Destroy a session**  **5.7. Maintain session data using Cookies 5.8. Add Parameters to a Cookie**  **5.9. Delete a Cookie**  **Unit 6: Introduction to CMS 6.1. Overview of Content Management Systems (CMS) Using** | | | | | | |

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|  | **Unit 6 CMS (Joomla / WordPress / Drupal /Wix..)**  **6.1 Joomla**  **6.2.Installation of Joomla**  **6.3.The Joomla elements**  **6.4.Joomla! Back-end**  **6.5.Joomla! Front end**  **6.6.Joomla! Templates**  **6.7 Joomla Plugins**  **Lab Contents:**  o**Client side scripting**  **Cascading style sheet**  **Java script**  **Dynamic HTML** o**Server side program**   * **Configuring web server** * **Get way**   **PHP**  o**Database driven website**   * **PHP and MY SQL server** * **Generate dynamic content**   o**Advanced internet programming**   * **Java applet** * **Java server page**   **CMS**  Creating website using content management systems (CMS) |
| Assessment | Assignments …………………………………………………….15%  Quiz and test ……………………………………………………20%  Midterm examination ……….………………………………… 20%  Final examination ……………………………………..………..45% |

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| Reference | **Reference**  1. PHP AND MYSQL FOR DYNAMIC WEB SITES by Larry Ullman  2. PHP and MySQL Web development by Luke Welling and Laura Thomson  3. PHP5 and MySQL Bible by Tim Converse and Joyce Park with Clark Morgan  4. Web Server Programming by Neil Gray  5. PHP Cookbook, 2nd Edition By David Sklar, Adam Trachtenberg  6. Beginning joomla by Dan Rahmel  7. Joomla for Dummies by Steven Holzner and Nancy Conner  8. SAM’s Teach yourself PHP in 24 hours |

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| **--------------**  **---------------------**  **Information Technology Program** | | | |
| **Module Number** | | **10** | |
| **Module Name** | | **Computer networks** | |
| **Total CP of the module** | | **23** | |
| **Mode of delivery** | | **Parallel** | |
| **Module Description** | | * This Module Covers Main Topics Such As Data Communications, Communications Network Architecture, Communications Network Protocols , Local And Wide Area Networks, Client-Server Computing, Data Security And Integrity, Issues And Architectures, Naming And Threads, Models Of Distributed Computing, Client-Centric Consistency Models, Mobile Digital Telecommunications, Fixed Digital Telecommunications, [Wireless Communications For Voice And Data](file:///D:\DVD1\EBook\Handbook%20of%20Communications%20Systems%20Management,%201999%20Edition\ch54\54-01.html#Heading1) , [Developing A Cost-Effective Strategy For Wireless Communications](file:///D:\DVD1\EBook\Handbook%20of%20Communications%20Systems%20Management,%201999%20Edition\ch55\55-01.html#Heading1) , [Security Of Wireless Local Area Networks](file:///D:\DVD1\EBook\Handbook%20of%20Communications%20Systems%20Management,%201999%20Edition\ch57\57-01.html#Heading1), [An Emerging Mobile (Cellular) Network Service](file:///D:\DVD1\EBook\Handbook%20of%20Communications%20Systems%20Management,%201999%20Edition\ch56\56-01.html#Heading1) , [Mobile User Security](file:///D:\DVD1\EBook\Handbook%20of%20Communications%20Systems%20Management,%201999%20Edition\ch59\59-01.html#Heading1) | |
| **Module competence** | | After completion of this module students will have the competencies in Understanding data transmission and transmission media, protocols, the concept of layering, recognize the importance of networking standards, and their regulatory committees. They will also differentiate the seven layers of the OSI model, compare and contrast the OSI model with the TCP/IP model. Moreover they will understand the implications of new technologies compare and contrast the advantage of wireless networking with fixed media, and construct wireless LANs that work with cellular devices. | |
| **Objective of the module** | | **At the end of this module:**   * Students will understand data transmission and transmission media, protocol, and the concept of layering. * Students will be able to recognize the importance of networking standards, and their regulatory committees. * Students will identify the seven layers of the OSI model. * Students will have a deep knowledge of TCP/IP and OSI model. * Students will understand the implications of new technologies. * Students will be able to compare and contrast the advantage of wireless networking with fixed media. * Students will be able to understand the worldwide communications by wireless communication * Students will be enabled to construct wireless LANS Work with cellular devices | |
| **Courses in the Module** | | | |
| **Course Code** | **Course Name** | | **CP** |
| **ITec2102** | Data Communication and Computer Networks | | 5 |
| **ITec4101** | Wireless Networking and Telecom Technologies | | 5 |
| **ITec3102** | Introduction to Distributed System | | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec3102 | | | | |
| **Course Title:** | Introduction to Distributed System | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | **Computer Networks** | | | | |
| **Module Number** | 10 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 3rd Year Information Technology Students | | | | |
| **Year /Semester** | Year: III, Semester: II | | | | |
| **Pre-requisites** | Data Communication and Computer Networks | | | | |
| **Status of the Course** | Core | | | | |
| **Course description** | This course covers the foundations of distributed systems including models of computing, logical clocks and synchronization, consensus, distributed indexing, concurrency, consistency, failures, reliability and security. We will examine popular applications of distributed computing; analyze how the foundations manifest themselves in different ways depending on real-world constraints. Such applications include distributed file systems, peer-to-peer systems, distributed transactions, and web services. | | | | |
| **Course objective** | At the end of the course the students should be able to:   * understand the importance of distributed computing * Differentiate the uni-scalar machines with that of high-end parallel systems | | | | |
| **Course Outline** | * **Introduction to Distributed Systems:** * **Issues and Architectures;** Characterization of Distributed Systems; Networking, internetworking and interposes communication. * **Naming and Threads:** Naming and name services; Remote Invocation, Processes and threads; * **Models of Distributed Computing: Performance, Replication, Virtualization, Scalability;** Synchronous network model and leader election; Asynchronous shared memory model, fairness, and mutual exclusion ; Data-Centric Consistency Models; Multicore architectures and benchmarks; * **Client-Centric Consistency Models** | | | | |

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| **--------------**  **------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | **ITec2102** | | | | |
| **Course Title:** | Data Communication and Computer Networks | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | **Computer Networks** | | | | |
| **Module Number** | **10** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 1st Year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: I | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Outline** | **Chapter 1: History and overview**   * 1. Indicate some reasons for studying networks   2. Highlight some people that influenced or contributed to the area of networks   3. Indicate some important topic areas such as network architectures and protocols, network types (LAN, WAN, MAN, and wireless), data security, data integrity, and network performance   4. Describe some of the hardware and software components of networks   5. Describe the operation of some network devices such as repeaters, bridges, switches, routers, and gateways   6. Indicate some network topologies such as mesh, star, tree, bus, and ring   7. Describe the purpose of network protocols   8. Mention some popular protocols   **Chapter 2: Data Communications**   * 1. Data transmission   2. Concepts and Terminology   3. Analog and Digital Data Transmission   4. Transmission Impairments   5. Transmission media   6. Guided Transmission Media   7. Wireless Transmission   **Chapter 3: Communications network architecture**   * 1. Network line configuration (point-to-point, multipoint)   2. Networking and internetworking devices: Repeaters, bridges, switches, routers, gateways   3. Network Topologies (mesh, star, tree, bus, ring)   4. Connection-oriented and connectionless services   **Chapter 4: Communications network protocols**  4.1 Network protocol  4.2 Overview of the TCP/IP Protocol suites  4.3 Network Standards and standardization bodies  **Chapter 5: Local and wide area networks**  5.1. LAN topologies (bus, ring, star)  5.2. LAN technologies (Ethernet, token Ring, GigaUniversity Ethernet)  5.3 Large networks and wide areas  **Chapter 6: Client-server computing**  6.1. Web technologies: Server-side programs; Socket programs; Server sockets; Client sockets; multithreading concepts;  **Chapter 7: Data security and integrity**   * 1. Fundamentals of secure networks; cryptography   2. Encryption and privacy   3. Authentication protocols   4. Firewalls   5. Virtual private networks   6. Transport layer security   **8. Lab Description**  Cabling and crimping, Peer to Peer Networking, Sharing Files, Sharing Printers, Client Server Networking, Steps for Creating a home or small office Network, Student Exercise, Installation, Server Roles, Setting up a DNS Server, Configuring TCP/IP  **Text and Reference:** Computer Networking. Kurose and Ross. Addison Wesley, latest edition  Software Requirements: Network Operating systems, Simulators, etc | | | | |
| **Assessments** | As per University Legislative | | | | |
| **Reference** | Textbook:   1. Computer Networking: A top down approach, 4th/5th edition, James F. Kurose and Keith W. Ross   References:   1. Computer Networks: *A systems approach, 4thed, Larry L. Peterson and Bruce S. Davie* 2. Computer Networks: *principles, technologies and protocols for network design*, Natalia Olifer, Victor Olifer. 3. Computer Networks, 4th Edition, Andrew S. Tanenbaum 4. W. R. Stevens. *TCP/IP Illustrated, Volume 3: The protocols,* Addison Wesley 5. R. Handel, M. N. Huber, and S. Schroeder. *ATM Networks: Concepts, Protocols, Applications,* Addison Wesley, 1998. *Networks: Concepts, Protocols, Applications,* Addison Wesley, 1998. 6. W. Stallings. Cryptography and Network Security: Principles and Practice, 2nd Edition, Prentice Hall | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4101 | | | | |
| **Course Title:** | Wireless Networking and Telecom Technologies | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Computer Networks | | | | |
| **Module Number** | 10 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 4th Year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: I | | | | |
| **Pre-requisites** | Data Communication and Computer network | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | Under this course, students will cover issues related to wireless Communications, Principles of wireless communications, Modes of wireless communication, Sea and Air Transceivers, Handheld Radio Transceivers, Shortwave Transceivers, Cellular Radio Telephones,Satellite Communications Radio Modems Wireless Communications and Transceivers—an Overview Non-Complex Signal Processing in a Low-IF Receiver A Reconfigurable Baseband Chain for 3G Wireless Receivers  Field-Programmable and Reconfigurable Analogue and Mixed-Signal Arrays A Low-Power,Low-Voltage Bluetooth Channel Filter Using Class AB CMOS Tran conductors. Design and Automatic Tuning of Integrated Continuous-Time Filter  Low-Voltage Integrated RF CMOS Modules and Frontend for 5 GHz and Beyond  Design of Integrated CMOS Power Amplifiers for Wireless Transceivers  Parasitic-Aware RF IC Design and Optimisation  Testing of RF, Analogue and Mixed-Signal Circuits for Communications—an Embedded.  This course is also designed to introduce students to different telecommunications technologies. It emphasizes on the techniques, equipments and protocols involved in today's digital telecommunications field. The course briefly describes both the theoretical and applicative aspCP regarding the transmission of information, the analog, digital and system standards of telecommunications. The Public Switched Telephone Network (PSTN) and Public Land Mobile Network (PLMN) are described briefly. The topics covered are Telecommunications, data transmission, analog channels, digital channels, fixed and mobile switching, signaling protocols, GSM, and GPRS | | | | |
| **Course Objective** | Students will be able to   * Compare and contrast the advantage of wireless networking with fixed media. * Understand the worldwide communications by wireless communication * secure equipment and premises remotely * Contract wireless LANS * Work with cellular devices * Describe the basic telecom principles and mobile communications standards * Identify different telecommunication | | | | |
| **Course Outline** | **Chapter 1: Introduction to Wireless Communication Telecom Systems**   * 1. Evolution of Mobile Radio Communications   2. The Telecom Industry: past, present and emerging trends   3. Mobile radio system around the world   4. Wireless and tele Communication systems   **Chapter 2: Fixed Digital Telecommunications**   * 1. Public Switched Telephone Network (PSTN)   2. Alcatel 1000 10 Commutation Center   3. Integrated Services Digital Network (ISDN)   4. Intelligent Telecommunication Networks   **Chapter 3** **Wireless Communication Systems**  **3.1.** First Generation (1G) Cellular Networks  **3.**2. Second Generation (2G) Cellular Networks  3.2.1. GSM (Global System for Mobile communications)- the popular 2G system  3.2.2. The 2.5G Cellular Network (GPRS) and EDGE  3.3. Third Generation(3G) Wireless Networks  3.4. Fourth Generation (4G) Wireless Networks  3.5. Next Generation (5G) Wireless Networks  3.6. Overview of Wireless Network Types   * + 1. Wireless Personal Area Network (WPAN): Bluetooth, UWB, and Sensor Networks     2. Wireless Local Area Networks (WLANs): 802.11 standard and MANET     3. Wireless Metropolitan Area Network (WMAN): Wireless Local Loop (WLL) and LMDS     4. Wireless Wide Area Network (WWAN): Cellular Network and Satellite communication   Chapter 3: Cellular Concept   * 1. Introduction   2. Frequency Reuse   3. Handoff Strategies   4. Interference and System Capacity   5. Trunking and Grade of Service(GOS)   Improving Coverage and Capacity in Cellular Systems  **Chapter 4: Mobile Radio Propagation- Large Scale Path Loss**  4.1 Introduction to Radio Wave Propagation  4.2Free Space Propagation Model  4.3The Three Basic Propagation Mechanisms  4.4Outdoor Propagation Models  4.5Indoor Propagation Models  4.6Signal Penetration into Buildings  4.7 Ray Tracing and Site-Specific modeling  **Chapter 5: Mobile Radio Propagation- Small Scale Fading and Multipath**   * 1. Small-Scale Multipath Propagation   2. Impulse Response Model of a Multipath Channel      1. Small Scale Multipath Measurements      2. Parameters of Mobile Multipath Channels      3. Types of Small Scale Fading      4. Rayliegh and Ricean Distributions      5. Statistical Models for Multipath Fading Channels      6. Theory of Multipath Shape Factors for Small Scale Fading Wireless Channel   Chapter 6: Multiple Access Techniques for Wireless Communications  6.1. Introduction  6.2. Frequency Division Multiple Access(FDMA)  6.3. Time Division Multiple Access(TDMA)  6.4. Space Division Multiple Access(SDMA)  6.5. Packet Radio  6.6 Capacity of Cellular Systems  **Chapter 7: Introduction to Emerging Wireless Networks and telecommunication system**   * 1. Ultra Wideband wireless (UWB)   2. Free Space Optics (FSO)-A “New Solution to the Last Mile”   3. Mobile Adhoc Networks (MANET)   4. Wireless Sensor Networks (WSN)   5. Flash OFDM   6. Other Current technologies in telecom industries | | | | |
| **Lab** | 1. Configuring and troubleshooting WLANs in different systems    1. Wireless Access point    2. Different system    3. Wireless adaptors 2. Building ad-hoc network 3. Assessing current trends in telecom companies, the strength and drawbacks and suggestions 4. Performance analysis and configuration of different wireless and telecom technologies using chosen network simulators | | | | |

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| **Assessments** | As per University Legislative |
| **References:** | * Jochen H. Schiller, Mobile Communications, 2nd Ed., Pearson Education Ltd, 2003. * Earle, E. (2006). Wireless Security Handbook by Taylor & Francis Group * LLC, Auerbach Publications. 4. Glisic, G. (2006).Advanced Wireless Networks 4G Technologies, University. of Oulu, Finland, John Wiley & Sons Ltd. * Burns, P. (2006) The Beginner’s Guide to Broadband and Wireless Internet, Summersdale Publishers Ltd. * Smyth, P. (2008). Mobile and Wireless Communications: Key Technologies and Future Applications, The Institution of Engineering and Technology, Michael &ARADAY * *Dr. Amjad Umar, Mobile computing and Wireless communications, Applications, Network, platforms, architecture, and security, published Date: July 2004* |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4103 | | | | |
| **Course Title:** | **Mobile Application Development** | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Computer Networks | | | | |
| **Module Number** | 10 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 4th Year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: I | | | | |
| **Pre-requisites** | Data Communication and Computer network | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course provides students with the concepts and techniques to design and develop mobile applications with iOS/android OS and to understand the design and development process involved and state-of-the-art mobile usability testing methods. Students will develop a series of smaller iOS/android OS applications in weekly lab sessions as well as larger application as part of a course project. In the process of developing these applications, students will develop a strong understanding of the **Swift programming language, iOS /android OS application development, mobile-centered design, and how to ensure technical quality in software development**. The course utilizes a hands-on approach to guide students through **learning and understanding the design and development process.** The course will address the need for facilitating a **'global' user experience**, through independent student projects that target a 'global or social' theme and deliver a complete solution involving design, development, and usability testing of a localized and responsive mobile application.This course is intended for students who have some prior programming experience. The course will introduce you to the basics of the Android platform, Android application components, Activities and their lifecycle, UI design, Multimedia, 2D graphics and networking support in Android. | | | | |
| **Course Objective** | Students will be able to   * Describe the basic components of an Android application. * Define the lifecycle methods of Android application components. * Describe the basics of event handling in Android. * Describe the basics of graphics and multimedia support in Android. * Demonstrate basic skills of using an integrated development environment (Android Studio) and Android Software Development Kit (SDK) for implementing Android applications. * Demonstrate through a simple application the understanding of the basic concepts of Android | | | | |
| **Course Outline** | **Chapter 1: Introduction**   1. Introduction to Mobile Computing 2. Introduction to Android Development Environment | | | | |
|  | **Chapter 2:** Factors in Developing Mobile Applications   * 1. Mobile Software Engineering   2. Frameworks and Tools   3. Generic UI Development   4. Android User   5. More on UIs      1. VUIs and Mobile Apps  1. Text-to-Speech Techniques    * 1. Designing the Right UI      2. Multichannel and Multimodial UIs | | | | |
|  | **Chapter 3:** Intents and Services   * 1. Android Intents and Services   2. Characteristics of Mobile Applications   3. Successful Mobile Development | | | | |
|  | **Chapter 4:** Storing and Retrieving Data   * 1. Synchronization and Replication of Mobile Data   2. Getting the Model Right   3. Android Storing and Retrieving Data   4. Working with a Content Provider | | | | |
|  | **Chapter 5** Communications Via Network and the Web   * 1. Communication, network and web  1. State Machine 2. Correct Communications Model 3. Android Networking and Web    1. Telephony 4. Deciding Scope of an App 5. Wireless Connectivity and Mobile Apps 6. Android Telephony    1. Notifications and Alarms 7. Performance 8. Performance and Memory Management 9. Android Notifications and Alarms | | | | |
|  | **Chapter 6:** Graphics and multimedia **Graphics**   1. Performance and Multithreading 2. Graphics and UI Performance 3. Android Graphics and    1. **Multimedia** 4. Mobile Agents and Peer-to-Peer Architecture 5. Android Multimedia | | | | |
|  | * 1. **Chapter 7: Location**  1. Mobility and Location Based Services 2. Android | | | | |
|  | **Chapter 8:** Putting It All Together(as time allows)   1. Packaging and Deploying 2. Performance Best Practices 3. Android Field Service App | | | | |

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| **Assessments** | As per University Legislative |
| **References:** | **Text books:**Android Studio Development Essentials by Neil Smith, 2014, CreateSpace Independent Publishing Platform; 2 edition, 978-1500613860. |

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| **--------------**  **---------------------**  **Information Technology Program** | | |
| **Module Number** | **15** | |
| **Module Name** | Network design and Administration | |
| **Total CP of the module** | **15** | |
| **Mode of delivery** | **Parallel** | |
| **Module competence** | * After completion of this module the students will have the knowledge and understanding of installation and configuration of network operating system, they get familiar with the concepts of network administration and network device installation. | |
| **Module Description** | * This module covers main topics such as Applying a Methodology to Network Design, Structuring and Modularizing the Network Designing Basic Campus and Data Center Networks, Designing Remote Connectivity, IP Addressing and selecting Routing Protocols, Evaluating Security Solutions for the Network, Identifying Voice Networking Considerations and Wireless Networking Considerations, Windows Network Concepts, User Administration Concepts & Mechanisms, Resource Monitoring & Management , Security and network devices. | |
| **Objective of the module** | **At the end of this module students should be able to:**   * Install and configure network operating system * Identify basic client server architecture * Configure web service, FTP service, active directory * Perform user and group administration tasks * Administer and secure servers * Design computer network for enterprise * Deploy small to medium size networks * Develop practical skill for network design in heterogynous * Discover Foundry network devices * Advanced knowledge on network device configuration * Create and configure VLANs * Monitor changes to Foundry network devices * Store and retrieve network events * Configure router * Configure and manage switch * Implement and configure network protocols * Mangling network | |
| **Courses in the Module** | | |
| **Course Code** | **Course Name** | **CP** |
| **ITec4111** | Network Design | 5 |
| **ITec4112** | System and Network Administration | 5 |
| **ITec4114** | Network Device and Configuration | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4111 | | | | |
| **Course Title:** | Network design | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Network design, configuration and administration | | | | |
| **Module Number** | 11 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 4th Year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: I | | | | |
| **Pre-requisites** | Data Communication and Computer Networks | | | | |
| **Status of the Course** | Core | | | | |
| **Course description** | This course is intended to teach students how to design and implement computer networks. The course covers detailed networking concepts like transmission media installation, switch and router selection and configuration, connecting to the internet, creating wired and wireless networks, implementing sub netting techniques and others. Students should be equipped with the latest networking technologies like WiFi and how to design an efficient computer network. | | | | |
| **Course Objective** | At the end of this course, students will be able to:   * Understanding how networks are integrated into business practices; * Design computer networks for enterprises * Deploy a small to medium sized networks * Understanding network simulation principles and methods; * Mastering the systems approach in network design; * Developing practical skills for network design in a heterogeneous environment. | | | | |
| **Course outline** | 1. Applying a Methodology to Network Design 2. Structuring and Modularizing the Network 3. Designing Basic Campus and Data Center Networks 4. Designing Remote Connectivity 5. Designing IP Addressing and selecting Routing Protocols 6. Evaluating Security Solutions for the Network 7. Identifying Voice Networking Considerations 8. Identifying Wireless Networking Considerations   **Lab contents:**   * Design basic campus network * Design remote network connectivity * Design IP addressing network * Design wireless network | | | | |
| **Assessment** | As per University Legislative | | | | |
| Reference | Network design reference manual (NDRM)- 6th edition  Top down network design(2nd edition) Cisco press | | | | |

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| **--------------**  **---------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4112 | | | | |
| **Course Title:** | System and Network Administration | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Computer Networks | | | | |
| **Module Number** | 11 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 4th Year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: II | | | | |
| **Pre-requisites** | Data Communication and Computer Network | | | | |
| **Status of the Course** | Core | | | | |
| **Course description** | Introduction to systems administration; configuration and administration of disk file systems; domain and workgroup concepts; user accounts; backing up and restoring files; auditing resources and events; network administration overview; TCP/IP; network layer and routing; router configuration | | | | |
| **Course objective** | At the end of this course students should be able to:  • Manage a network  • Create and manage users and groups;  • Configure switches and routers;  • Manage disks and files;  • Backup and restore system and user data  • Remotely administer a network | | | | |
| **Course outline** | **Unit One**   1. Introduction & Background    1. Computer Systems & Network overview    2. Philosophy of System Administration   **Unit Two**   1. Windows Network Concepts    1. Workgroups    2. Server Domain    3. Domain Controllers    4. LDAP & Windows Active Directory ®   **Unit Three**   1. User Administration Concepts & Mechanisms    * 1. Users and capabilities      2. Policy Tools & Roaming Profiles      3. Advanced Concepts I         1. The Registry      4. Automating Administrative Tasks - Windows Host Scripting    1. Advanced Concepts II       1. Routing and NAT       2. Proxies and Gateways   **Unit Four**   1. Resource Monitoring & Management I    * 1. Stand-alone systems (Memory, Disk Use, CPU Use)      2. Monitoring Tools      3. Routine Resource Maintenance    1. Resource Monitoring & Management II       1. Bandwidth       2. File & Mail Servers       3. Network Printers    2. Remote Administration    3. Performance       1. RAID       2. SCSI   **Unit Five**   1. Security    1. Introduction    2. Linux Systems and Network Concepts    3. Linux Resource Monitoring & Management       1. Monitoring Tools       2. Network Bandwidth and Processing Power       3. Managing Storage    4. Linux User Administration    5. Linux Service/Server Administration       1. Supporting a Windows Network - through SAMBA       2. Mail Server | | | | |

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| **Assessments** | As per University Legislative |
| **References:** | **Text andReferences**  Computer Networks, 3rd edition, by Andrew Tanenbaum, Prentice Hall.  An Engineering Approach to Computer Networks, S. Keshav.  High Performance Communication Networks, Jean Walrand, Pravin .  Internetworking Multimedia, Jon Crowcroft, Mark Handley and Ian Wakeman.  **Software**  Windows server 2011 operating System, Solaris Operating System, Cisco IOS simulator, |

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| **--------------**  **-------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4114 | | | | |
| **Course Title:** | Network device and configuration | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Network design, configuration and administration | | | | |
| **Module Number** | 11 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Lab/Practical** | **Tutorial** | **Home Study** | **Total** |
| 2 | 3 | 0 | 5 | 10 |
| **Target Group:** | 4th Year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: II | | | | |
| **Pre-requisites** | Data Communication and Computer Networks | | | | |
| **Status of the Course** | Core | | | | |
| **Course description** | This course is designed on introducing students to different network devices and their characteristics. In addition network device installation and maintenance will be discussed in the course. | | | | |
| **Course Objective** | After completion of this course student will be able to:   * Discover Foundry network devices * Advanced knowledge on network device configuration * Create and configure VLANs * Monitor changes to Foundry network devices * Store and retrieve network events * Configure router * Configure and manage switch * Implement and configure network protocols * Mangling network | | | | |
|  | Course outline   1. Device Configuration    * Configuration Wizard.    * View VLANs by device and port.    * Automatic Discovery and Configuration Manager.    * Wireless Mobility configuration menu    * Device Schedules    * VPN Policy Manager    * Element Manager.    * CLI Configuration Manager. 2. Router and Switch    * Basic configuration    * Passwords    * Wildcard masks    * Access Control Lists    * Remote access    * Logging with syslog usage    * Miscellaneous 3. Routers    * Router basic configuration    * Static routing    * Dynamic routing    * Routing protocols matrix    * RIP    * IGRP    * EIGRP    * OSPF    * DHCP    * NAT and PAT    * PPP    * Frame Relay    * Router on the stick 4. Switches    * Switch basic configuration    * CAM table    * Port security    * VLANs    * STP    * VTP    * Inter VLAN communication    * Miscellaneous   Labs   * + RS0 - Router and Switch basic configuration   + S01 - Switch basic configuration   + S02 - Switch VLAN configuration   + R01 - Static routing   + R02 - RIP v.1   + R03 - RIP v.2   + R11 - PAT and DHCP   + R12 - PAT, DHCP and DHCP Relay   + R13 - NAT/PAT and DHCP   + R14 - PPP   + R15 - ACL   + R16 - Frame Relay   + RS01 - DHCP and VLANs | | | | |

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| **Assessments** | As per University Legislative |
| **References:** | * Rufi, Oppenheimer, Woodward and Brady, Network Fundamentals, CCNA Exploration Labs and Study Guide, CISCO Press, 2008. * Dye, McDonald and Riufi, Network Fundamentals, CCNA Exploration Companion Guide, CISCO Press, 2007. * [Top-Down Network Design (2nd Edition)](http://www.amazon.com/Top-Down-Network-Design-Priscilla-Oppenheimer/dp/1587051524/ref=dp_ob_title_bk) By [Priscilla Oppenheimer](http://www.ciscopress.com/authors/bio.asp?a=2814d565-e380-4927-a61e-310dfa7afd4e). Published by [Cisco Press](http://www.ciscopress.com/). Published: May 27, 2004.   Christina J. Hogan. The Practice of System and Network Administration, Addison-Wesley Professional, 2001. |

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| **--------------**  **---------------------**  **Information Technology Program** | | |
| **Module Number** | **10** | |
| **Module Name** | Artificial Intelligence and Multimedia | |
| **Module CP** | **10** | |
| **Mode of Delivery** | **Parallel** | |
| **Module Competences** | * After completion of this module the students will have the fundamental concepts of multimedia, get familiar with applicable areas of multimedia systems, understand design and code multimedia systems, and have core knowledge in different human computer interaction systems. | |
| **Module Description** | This module covers main topics such as Multimedia Authoring and Tools, Data Representations, Image and Video, Fundamental Concepts in Video, Basics of Digital Audio , Lossless Compression Algorithms, Basic Vidéo Compression Techniques and MPEG Video , Audio Coding, Human and computer HCI, Interaction Design and HCI in the Software Process, Design Rules , Implementation and user support, Evaluation Techniques and Universal Design. | |
| **Module Objectives** | At the end of the module students will :   * Enable students understand fundamental concepts of multimedia * Enable students know applicable areas of multimedia systems * Enable students understand design and code multimedia systems * Students enable to understand different human computer interaction systems | |
| ***Courses in the Module*** | | |
| **Course Code** | **Course Name** | **CP** |
| ITec3121 | Multimedia Systems | 5 |
| ITec4121 | Artificial Intelligence | 5 |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | Itec3121 | | | | |
| **Course Title:** | Multimedia Systems | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Artificial intelligence and Multimedia | | | | |
| **Module Number** | 12 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Target Group:** | 3rd year Information Technology Students | | | | |
| **Year /Semester** | Year: III, Semester: II | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | Multimedia technologies; multimedia storage models and structures; data models and interfaces; multimedia information systems; video/audio networking; media synchronization; image computing and information assimilation; conferencing paradigms and structured interaction support. | | | | |
| **Course Objective** | At the end of the course, students should:   * Understand the basic concepts of multimedia * Understand where and how to use multimedia systems * Design different kinds of multimedia systems * Write different kinds of code that are used in Multimedia Applications/perform multimedia functions | | | | |
| **Course Outline** | **Chapter One**  Introduction  1.1 What is Multimedia?  1.2 History of Multimedia  1.3 Multimedia and Hypermedia  1.4 Multimedia and World Wide Web  **Chapter Two**  Multimedia Authoring and Tools  2.1 What is Multimedia Authoring?  2.2 Some Useful Editing and Authoring Tools 2.3 Authoring Paradigms  **Chapter Three**  Data Representations  3.1 Graphics/Image Data Representation  3.2 Digital audio and MIDI  3.3 Popular File Formats  **Chapter Four**  Image and Video  4.1 Color Science  4.2 Colour Models in Images  4.3 Colour Models in Video  **Chapter Five**  Fundamental Concepts in Video 5.1 Types of Video Signals  5.2 Analogue Video  5.3 Digital Video  5.4 Different TV standards  **Chapter Six**  Basics of Digital Audio  6.1 Digitization of Sound  6.2 Quantization and Transmission of Audio  **Chapter Seven**  Lossless Compression Algorithms  7.1 Introduction  7.2 Basics of Information Theory  7.3 Run-Length Coding  7.4 Variable-Length Coding (VLC)  7.5 Dictionary Based Coding  7.6 Huffman Coding  7.7 Arithmetic Coding  7.8 Lossless Image Compression  **Chapter Eight**  Loss Compression Algorithms  8.1 Introduction  8.2 Distortion Measures  8.3 The Rate Distortion Theory  8.4 Quantization  8.5 Transform Coding  **Chapter Nine**  9.1 Image Compression Standards  9.2 the JPEG Standard  **Chapter Ten**  Basic Video Compression Techniques  10.1 Introduction to Video Compression  10.2 Video Compression Based on Motion Compensation  **Chapter Eleven**  MPEG Video and Audio Coding  11.1. Video Compression  11.2 MPEG Audio Compressions  **Lab content**   * Macromedia Author ware Basics: * The Author ware window; toolbars; shortcut; authoring; piece; icon; linking; image; video; sound; * Analyzing a completed Piece: * Navigating through completed piece – sound, picture and video; adding sound and picture in a completed piece * Creating a new project File using Knowledge objects: * steps to create a new project file using knowledge objects * Adding a knowledge objects to a file: * Exercise steps of adding knowledge objects to a file * Setting up icon properties, presentation windows * Saving, opening and Running a piece * Creating a title page * Create text using the toolbox * Adding Graphic Background and different buttons * Adding Sounds and Movie * Grouping Icons in to a map Icon * Creating Menu with hotspots * Inserting Map icons * Creating A master Framework * Editing an External RTF File * Creating A quiz using Knowledge objects * Using Quiz Knowledge Object * Video and Audio Editing; Using multimedia applications; scripting | | | | |
| **Teaching Strategy** | The course will be delivered in the form of lectures, demonstration, student presentations, group discussions, and individual and group project works. | | | | |
| Assessment Criteria | As per the academic regulation. | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | |
| **Role of Instructor(s)** | Deliver lectures, motivate students to participate in class, assign and guide individual and group assignments, and assess performance of learners | | | | |
| **Role of Students** | Attend lectures, participate in class discussions, do individual and group assignments, present individual and group assignment in class, and attend quiz, midterm and final examination. | | | | |
| **Required software and/or hardware** | * Macromedia Flash Player * Ulied Video Editor * Audacity * Wonder Share Filmora X Video Editor | | | | |
| **Reference** | 1) Ze-Nian Li and Mark S. Drew, Fundamentals of Multimedia, Prentice Hall, 2004.  2) Richard Brice, Multimedia and Virtual Reality Engineering, Newnes, 1997  3) Jon Crowcroft, Mark Handley, Ian Wakeman; Internetworking Multimedia,  Morgan Kaufmann Publishers, San Francisco, California, 1999  4) Doug Sahlin, Flash 5 Virtual Classroom, McGraw-Hill, 2001, California   1. Nielsen, J. (1993). Usability Engineering. 2. Shneiderman, B. (1997). Designing the User Interface | | | | |

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| **--------------**  **----------------------**  **Information Technology Program** | | | | | | | |
| **Program** | Information Technology | | | | | | |
| **Course Code** | ITec4121 | | | | | | |
| **Course Title:** | Artificial Intelligence | | | | | | |
| **Degree Program** | Information Technology | | | | | | |
| **Module Name** | Artificial Intelligence and Multimedia | | | | | | |
| **Module No.** | 12 | | | | | | |
| **CP** | 5 | | | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | | **Home Study** | | **Total** |
| 2 | 0 | 3 | | 5 | | 10 |
| **Target Group:** | 4th year Information Technology Students | | | | | | |
| **Year /Semester** | Year IV, semester I | | | | | | |
| **Pre-requisites** |  | | | | | | |
| **Status of the Course** | Major | | | | | | |
| **Course description**  The purpose of this course is to give students an understanding of Artificial Intelligence methodologies, techniques, tools and results. Students will use at least one AI-language [Lisp, Prolog]. Students will learn the theoretical and conceptual components of this discipline and firm up their understanding by using AI and Expert System tools in laboratory sessions, projCP and home assignments.  **Course Objective:**  At the end of this course the students will be able to:   * Understand reasoning, knowledge representation and learning techniques of artificial intelligence * Evaluate the strengths and weaknesses of these techniques and their applicability to different tasks * Assess the role of AI in gaining insight into intelligence and perception * know classical examples of artificial intelligence * know characteristics of programs that can be considered "intelligent" * understand the use of heuristics in search problems and games * know a variety of ways to represent and retrieve knowledge and information * know the fundamentals of artificial intelligence programming techniques in a modern programming language * consider ideas and issues associated with social technical, and ethical uses of machines that involve artificial intelligence | | | | | | | |
| **Content** | | | | **Week** | | **Reference book** | |
| CHAPTER 1:   1. Introduction to AI    1. Objectives/Goals of AI    2. What is AI?    3. Approaches to AI – making computer:       1. Think like a human ( Thinking humanly)       2. Act like a human (Acting humanly)       3. Think rationally (Thinking rationally)       4. Act rationally (Acting rationally)    4. The Foundations of AI    5. University s of History and the State of the Art | | | | week 1 and 2 | | Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall. | |
| CHAPTER 2:   1. Intelligent Agents    1. Introduction    2. Agents and Environments    3. Acting of Intelligent Agents (Rationality)    4. Structure of Intelligent Agents    5. Agent Types       1. Simple reflex agent       2. Model-based reflex agent       3. Goal-based agent       4. Utility-based agent       5. Learning agent    6. Important Concepts and Terms | | | | weeks 3 and 4 | | Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall. | |
| CHAPTER 3:   1. Solving Problems by Searching and Constraint Satisfaction Problem    1. Problem Solving by Searching    2. Problem Solving Agents    3. Problem Formulation    4. Search Strategies    5. Avoiding Repeated States    6. Constraint Satisfaction Search    7. Games as Search Problems | | | | Weeks 5,6,7 and 8 | | Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall. | |
| CHAPTER 4:   1. Knowledge and Reasoning    1. Logical Agents    2. Propositional Logic    3. Predicate (First-Order)Logic    4. Inference in First-Order Logic    5. Knowledge Representation    6. Knowledge-based Systems | | | | Weeks 9 and 10 | | Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall. | |
| 1. **Uncertain Knowledge and Reasoning (optional)**    1. Quantifying Uncertainty    2. Probabilistic Reasoning    3. Probabilistic Reasoning over Time    4. Making Simple Decisions    5. Making Complex Decisions | | | | weeks 11 and 12 | | Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall. | |
| **Chapter 5:**   1. Learning    1. Learning from Examples/Observation    2. Knowledge in Learning    3. Learning Probabilistic Models    4. Neural Networks | | | | Weeks 13 and 14 | | Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall. | |
| 1. **Communicating, Perceiving, and Acting**    1. Natural Language Processing    2. Natural Language for Communication    3. Perception    4. Robotics | | | | weeks 15 and 16 | | Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall. | |
| **Assessment Method :**  As per University Legislative  Text Book  Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach Prentice-Hall.  References   1. Luger, G. (2002) Artificial Intelligence, 4th ed. Addison-Wesley. 2. Bratko, Ivan (1990) PROLOG Programming for Artificial Intelligence, 2nd ed. Addison-Wesley, 1990 3. Winston, P.H. (1992) Artificial Intelligence Addison-Wesley. 4. Ginsberg, M.L. (1993) Essentials of Artificial Intelligence. Morgan Kaufman.   Software Requirement: PROLOG, LISP and PYTHON | | | | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | |
| Module Number | **13** | |
| Module Name | **Information Technology and Society** | |
| Module CP | **7** | |
| Mode of Delivery | **Parallel** | |
| Module Description | * This module includes courses related with security, professional ethics and current trends. It covers theory and practice of Information system security. In addition it includes a course about social and professional context of information technology and computing, and adheres to ethical codes of conduct. A seminar on current topics of Information Technology is also included. | |
| Module Competences | * After completion of this module the students will properly identify threats, Risks and vulnerabilities, data Security Policies/Admin Security, information Systems Security concepts, and designing secure systems. They will also describe professional ethics, professional communication, the legal issues in computing, the social context of computing and the responsibilities of IT professionals. | |
| Module Objectives | At the end of the module students will :   * Identify threats, Risks and Vulnerabilities * know Data Security Policies/Admin Security * know Information Systems Security concepts * Designing secure systems * Describe what professional ethics is * Describe professional communication * Describe the legal issues in computing * Describe the social context of computing * Describe the responsibilities of IT professionals | |
| ***Courses in the Module*** | | |
| **Course Code** | **Course Name** | **CP** |
| ITec4134 | Social and Professional Ethics in Information Technology | 3 |
| ITec3131 | Seminar on Current Trends in Information Technology | 1 |
| ITec4133 | Information Assurance and Security | 3 |

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| **--------------**  **--------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4132 | | | | |
| **Course Title:** | Information Assurance and Security | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Information Technology and Society | | | | |
| **Module Number** | 13 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 0 | 3 | 10 |
| **Target Group:** | 4th Year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: I | | | | |
| **Pre-requisites** | ITec2022, ITec3101 | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course covers theory and practice of Information system security. Students will learn the principles of information security, security architectures and models, aspCP and methods of information security such as physical security control, operations security, access control, security threats, risks, vulnerabilities, Data security Policies/Admin, Security Procedural Control, Designing secure systems, Cryptography-symmetric and asymmetric. Students will also learn how to plan and manage security, security policies, business continuity plans, disaster recovery plans, and social and legal issues of information security. | | | | |
| **Course Objective** | At the end of this course the students will be able to know   * Threats, Risks and Vulnerabilities * Data Security Policies/Admin. Security * Information Systems Security concepts   Designing secure systems | | | | |
| **Course Content** | **Chapter one**  Course Introduction   * 1. Enterprise Security   2. Cyber defense      1. Enterprise Security within an Enterprise Architecture Context   **Chapter Two**   1. Brief Overview of Commercial Issues    1. Cryptography    2. Web Services Security    3. Convergence       1. Communications and Information       2. Wired/Wireless PKI (Public Key Infrastructure)       3. Windows Vista Security: Internet: Protocol versions 4/6       4. Implementing Enterprise Security Architecture (ESA)       5. Intrusion Detection System/Prevention (IDS/IPS): Overview   **Chapter three**   1. Network Firewall Security    1. Definitions and Terminology    2. Internet Security Architecture    3. IPv6 Security Considerations    4. Host Security (authentication and authorization techniques)   **Chapter four**   1. Review of Shared Key Cryptography and Hash Functions    1. Basic Public Key Cryptography (DH, RSA, CAs, PKI)    2. Introduction to the TCP/IP Stack    3. Network Security (ports and protocols)    4. Firewalls and Firewall Rules   **Chapter Five**   1. Application Security (vulnerabilities of programming/scripting languages)    1. Malicious Code (virii, worms, malware)    2. Securing Services (shells, e-mail, web servers)    3. Identifying Vulnerabilities (tools and techniques)   **Assessment/Evaluation**  As per University Legislative | | | | |

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| **--------------**  **-------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4134 | | | | |
| **Course Title:** | Social, Professional and Ethical issues in Information Technology | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Information Technology and Society | | | | |
| **Module Number** | 13 | | | | |
| **CP** | 3 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 2 | 0 | 0 | 4 | 6 |
| **Target Group:** | 4th year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: II | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | In addition to technical skills, IT professionals must understand the social and professional context of information technology and computing, and adhere to ethical codes of conduct. This knowledge area covers the historical, social, professional, ethical and legal aspects of computing. It identifies how teamwork is integrated throughout IT and how IT supports an organization and society. | | | | |
| **Course Objectives** | After completing this course students will be able to:   * Describe what professional ethics is * Describe professional communication * Describe the legal issues in computing * Describe the social context of computing * Describe the responsibilities of IT professionals | | | | |

**Course content**

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| **Week** | **Lecture Topics** | **Reading/**  **Assignments** |
| 1-3 | **Part 1 - Morality, Ethics, Justice, Rights:**  1.1 What is "Critical Analysis"?  1.2 What are "Ethics" and "Morality"?  1.3 Moralities, Values, and Needs  1.4 Mill's Liberty Presumption  1.5 Discussion of Mill's "On Liberty"  1.6 Liberty-limiting principles  1.7 Comparative Justice and Distributive Justice  1.9 The Nature, Kinds, and Grounds of Rights  1.10 Human Rights, Derivative Moral Rights.  1.11 Kant's Ethical Formalism and Rawls Social Justice Ethics | **Reading:**  TB1 pp 4-11  TB2 pp 12-28  TB 1 pp29-38 |
| 4-8 | **Part 2 - Creativity: employer and employee rights in IT Matters**   * 1. Development of software: who owns the intellectual property (IP)?   2. Development of hardware: who owns the intellectual property (IP)?   3. What are "reasonable limitations" on IP ownership by an employee?   4. The Nature Of Digital Reliability And Failure:   5. Representing and communicating risk from software and hardware: who is responsible?   6. From medical software to "Star Wars" and the complexity of computer systems; origins of the Computer Professionals for Social Responsibility; what is "reasonable reliability in complex systems.   7. "Goofing off": who owns the "Easter eggs"? Why are they tolerated? | **Reading:**  TB1 pp 4-11  TB2 pp 12-28 |
| 9-12 | **Part 3: Civil issues and criminality in computing – Unethical and Illegal Activities:**   * 1. Theft of source code, misrepresentation of authorship / ownership   2. Misrepresentation of performance, reliability and risk   3. Theft of operating software (license avoidance, illegal duplication)   4. Denial of access (Microsoft versus Netscape)   5. Illegal entry methods (exploiting weakness in communication programs)   6. Denial of service attacks   7. Misrepresentation of identification   8. Cyber terrorism: the origins and development of viruses and malware. Types of internet disruption. Defenses   9. Websites, e-commerce and data: rights to access and to privacy, data banks, the growth of the electronic porn industry (what's on my hard drive?) | **Reading:**  TB1 pp 4-11  TB1 pp 12-28 |
| 13-16 | **Part 4: Commentary on Legal Frameworks and Enforcement:**   * 1. Federal Legislation: Privacy Act, Charter of Rights and Freedoms, Copyright Act, Amendments to Copyright Act to incorporate electronic retransmissions, Industrial Design Act, Integrated Circuit Topography Act, Personal Information Protection and Electronic Documents Act, Protection of children and other vulnerable persons and amendments to the Canada Evidence Act (2002-2003) and the Criminal Code of Canada   2. Ontario Legislation: Electronic Commerce Act   3. The Guardians: RCMP Commercial Crime: Computer Investigations and Support Section, International and other nations' efforts. Impersonation, tracking: do the ends justify the means? Standards for the examination of evidence: Law Enforcement Computer Evidence Suite. Is self policing and self-protection possible or even desirable? e.g P3P (Platform for Privacy Preferences)   **Assessment Methods**  Assignments…………………………………………20%  Quiz………………………………………………….20 %  Tests…………………………………………………20%  Final examination…………………………………..40%  **Reference book**   * 1. ***The Handbook of Information and Computer Ethics***: Kenneth EinarHemma and Herman T.Tavani, New Jersey, USA (2008)   2. ***Professional Issues in Information Technology***: Frank Bott, The British Computer Society, UK (2005)   ***Ethical and Social Issues in Information Systems***: 2005 | **Reading:**  TB1 pp 4-11  TB1 pp 12-28 |

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| **--------------**  **-------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4131 | | | | |
| **Course Title:** | Seminar on Current Trends in Information Technology | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | Information Technology and Society | | | | |
| **Module Number** | 13 | | | | |
| **CP** | 1 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 1 | 0 | 0 | 1 | 1 |
| **Target Group:** | 4th year Information Technology students | | | | |
| **Year /Semester** | IV/I | | | | |
| **Pre-requisites** |  | | | | |
| **Status of the Course** | Core | | | | |
| The content of the course is based on the current issues selected by the instructor and the assessment is determined based on the content selected. | | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | |
| Module Number | **14** | |
| Module Name | **Elective** | |
| Module CP | **20** | |
| Mode of Delivery | **Parallel** | |
| Module Competences | * This module has different courses that enable students to enrich their skill and knowledge in areas of the selected courses. | |
| Module Description | * This module includes three elective courses such as Artificial Intelligence, Computer graphics and Geographic Information System. The module introduces students with an understanding of Artificial Intelligence methodologies, techniques, tools and results. Topics related with design, development, and application of Geographic Information Systems (GIS) and the knowledge to build and manage spatial databases and perform spatial analysis using database management systems (DBMS) and GIS tools are included. In addition, the module provides a unified introduction to computer graphics, computer vision for students with an interest in imaging or digital visual arts, and to the highest extent creates animated objCP and video game development. | |
| Module Objectives | * Maximizes students reasoning ability in various areas of problem solving * Helps students to integrate and apply their knowledge in the area of Geographical Information System and remote sensing. * Students will visualize concepts of computer graphics and usage. | |
| ***Courses in the Module*** | | |
| **Course Code** | **Course Name** | **CP** |
| ITec4144 | Integrative programming and Technologies | 5 |
| ITec4144 | Introduction to Data mining | 5 |
| ITec4146 | E-commerce | 5 |
| ITec4142 | Computer Graphics | 5 |

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| **--------------**  **--------------------**  **Information Technology Program** | | | | | | | |
| **Program** | Information Technology | | | | | | |
| **Course Code** | ITec4142 | | | | | | |
| **Course Title:** | Computer graphics | | | | | | |
| **Degree Program** | Information Technology | | | | | | |
| **Module Name** | Elective | | | | | | |
| **Module No.** | ITec-M4152 | | | | | | |
| **CP** | 5 | | | | | | |
| **Contact Hours** | **Lecture** | | **Tutorial** | | **Lab/Practical** | **Home Study** | **Total** |
| 2 | | 0 | | 3 | 5 | 10 |
| **Target Group:** | 4th year Information Technology Students | | | | | | |
| **Year /Semester** | Year IV, semester II | | | | | | |
| **Pre-requisites** |  | | | | | | |
| **Status of the Course** | Elective | | | | | | |
| Course objectives and competence acquired | Up on the completion of the course, students will be able to:   * Have a knowledge and understanding of the structure of an interactive computer graphics system, and the separation of system components. * Understand the fundamental concepts of Perspective and other types of projections. * Learn geometrical transformations especially 3D transformation. * Be able to create interactive graphics applications. * Learn how to use OpenGL to perform items stated above. * Have a knowledge and understanding of techniques for representing 3D geometrical objCP. * Learn line generation and geometrical artifacts. * Have a knowledge and understanding of the fundamental principles of local and global illumination models. * Learn how to use image applications and use image format appropriately. * Differentiate the difference between Modeling and graphics. * Use openGL to manipulate lighting and shading. * Know how colors are maneuvered in computer. * Understand the fundamental concepts of rendering with openGL. * Model 3D objCP using polygons. * Understand non-polygon representation of objCP and realize the difference between the above. * Have a knowledge and understanding of the fundamental principles of application modeling. | | | | | | |
| Course Descriptions | The aim of this course is to provide a unified introduction to computer graphics and computer vision for students with an interest in imaging or digital visual arts and to the highest extent, create animated objCP and video game development.  The course primarily introduces both the hardware and software utilized in computer graphics. The emphasis is on creating a working graphics system from the ground up, but modern models and applications are also discussed and utilized.  The fundamentals of display hardware and applications, interactive techniques and color models, study of 3D viewing pipeline, drawing images in OpenGL, 3D polygon rendering and transformations are discussed shrewdly.  Course provides hands-on experience through programming assignments. Example code and lecture material will be presented in C++ or Java using the OpenGL API. It is highly recommended that assignments be completed in C++/Java. You are free to use whatever language you want, with four caveats discussed here under, unless and otherwise the lecturer wants the students to work on a selected language due to some reasons:   * + Setup and debugging help will not be offered for languages other than C or C++.   + Code other than C or C++ must run on all of the Windows OS   + Instructions for compilation and running of executables must be extra clear.   + Partial credit may not be assigned for ”partially working” code.   OpenGL should be installed on all laboratory Windows machines and Linux. Assignments may be done on either Windows (using Visual Studio .NET or Netbeans) or Linux (using gcc/g++).OpenGL does not have calls to deal with user interaction, like mouse clicks or opening windows. | | | | | | |
| Pre-requisite | ITec1042 | | | | | | |
| Semester | II | | | | | | |
| Status of the course | Elective | | | | | | |
| Summary of Teaching and learning methods | The mode of the delivery : parallel and combines   * **Lectures**- high-level orientation of concepts by instructor. * **Intensive laboratory practical activities-** Group ProjCP and Individual ProjCP. * **Home assignments-** Concept Based exercises * **Tutorials**- Orientation on concepts that needs extra effort | | | | | | |
| Expectations | * You MUST attend the lecture in which you are scheduled. Any work done in the wrong lecture will NOT count towards your grade. If you need to switch your lecture and/or lab section, you must fill out the appropriate paperwork and have it signed by the instructor or course coordinator. * If during this course, you experience a managerial problem with the conduct of the course (*i.e. instructor not available during office hours, inappropriate teaching behavior, discrimination, etc.*), you are expected to forward your due consideration to an appropriate personnel. | | | | | | |
| Policies | Students should note that completion of both the programming and theoretical assignments will be necessary to achieve good grades. There are two things students should be aware of before penalized for the crime they might commit.   * There will be a penalty for late assignments which may amount to 10% per day. * Unless intended to be done in group, assignments are to be completed by the student without assistance from or collaboration with other persons.   Students should make sure their code is debugged or come up without error (i.e., one should be able to compile and run without medications to the source code) Programming projCP will have their due dates announced in class or Laboratory session | | | | | | |
|  | End of week 4 | Assignment one | | The goal of this assignment is to get comfortable with the programming environment you will be using for this class, familiarize yourself with two simple libraries that we will use for linear algebra and images. It's an opportunity to know OpenGL Deeply  *Detail Description will be given* | | | |
| End of week 7 | Assignment two | | Apply the OpenGL transformations to some simple 3D line drawing (e.g. the unit cube or the house) and verify that what you expect to happen did indeed happen. Check your results by directly comparing the matrices you obtain for several combinations with ones produced by calls to various OpenGL transformations. This is a good way to understand exactly what the OpenGL operations do | | | |
| End of week 13 | Assignment three | | Assume the function void earth (); draws a three dimensional model of the earth with the south  pole at the origin, the north pole at the point (0; 1; 0), and the Greenwich meridian (0o longitude)  pointing in the z-direction. We are interested in drawing the earth as seen from a point in space  with a given longitude and latitude (specified in degrees) and given distance from the surface of  the earth. We want to be looking down into the direction of the earth's center and have a square  viewport that should cover a field of vision of 30o degrees. We are assuming the earth is a perfect  sphere.   * + Does the specification above uniquely determine the perspective viewing transformation? * Explain if there are additional degrees of freedom.   Give code for a function void viewEarth (float longitude, float latitude, float distance); and carefully explain the reasoning behind your solution. If there are additional degrees of freedom, set them to some reasonable values. Your function should call earth (); to draw the earth. | | | |
| Week 1 | **UNIT 1: Introduction to interactive computer graphics** | | * ***Brief History of Computer Graphics*** * ***3D Graphics Techniques and Terminology*** * ***Common Uses of Computer Graphics*** * ***Examples of application areas*** | | | |
| **End of week 1** | **Suggested Readings** | | 1. **Richard S. Wright et.el***. OpenGL® SuperBible: Comprehensive Tutorial and Reference, Fifth Edition* Addison-Wesley Professional **Chapter 1**   . | | | |
| Week 2, 3 | **UNIT 2: Graphics hardware** | | * ***Raster display systems*** * ***Introduction to the 3D graphics pipeline*** * ***The Z Buffer for hidden surface removal*** | | | |
| **Mid of week 3** | **Suggested Readings** | | 1. **Glen W Rowe, *Computer*** *Graphics with Java***,** PALGRAVE, 2001**. Chapter 2** | | | |
| Week 3,4 | **UNIT 3: Introduction to the rendering process with OpenGL** | | * The role of OpenGL in the reference model Coordinate systems * Viewing using a synthetic camera * Output primitives and attributes. | | | |
| **End of week 4** | **Suggested Readings** | | 1. **Richard S. Wright et.el***. OpenGL® SuperBible: Comprehensive Tutorial and Reference, Fifth Edition* Addison-Wesley Professional **Chapter 3** 2. **Glen W Rowe, *Computer*** *Graphics with Java***,** PALGRAVE, 2001**. Chapter 8** | | | |
| Week 5,6 | **UNIT 4: Geometry and Line Generation** | | * Point and Lines, Bresenham’s * algorithm Generating Circles * Plotting General Curves * Line Thickness * Line Style * Polygons * Filling * Text and Characters | | | |
| **End of week 6** | **Suggested Readings** | | 1. **Glen W Rowe, *Computer*** *Graphics with Java***,** PALGRAVE, 2001**. Chapter 3** 2. **Richard S. Wright et.el***. OpenGL® SuperBible: Comprehensive Tutorial and Reference, Fifth Edition* Addison-Wesley Professional **Chapter 2** | | | |
| Week 7,8 | **UNIT 5: Geometrical Transformations** | | * ***3D transformation*** * ***Matrix representation*** * ***Homogeneous coordinates*** * ***Combination of transformations*** | | | |
| **End of week 8** | **Suggested Readings** | | 1. **Glen W Rowe, *Computer*** *Graphics with Java***,** PALGRAVE, 2001**. Chapter 4 and 5** 2. **Richard S. Wright et.el***. OpenGL® SuperBible: Comprehensive Tutorial and Reference, Fifth Edition* Addison-Wesley Professional **Chapter 4** | | | |
| End of week 9 | Mid examination | | Mid examination will includes all the topics discussed up until now by giving more focus for topics that are not included on quizzes | | | |
| Week 10 | **UNIT 6:**  **State Management and Drawing Geometric ObjCP** | | * ***Basic State management*** * ***Displaying Points Lines and Polygons*** * ***Normal Vector*** * ***Vertex Array*s** | | | |
| **End of week 10** | **Suggested Readings** | | 1. **David Shreiner**OpenGL® Programming Guide: The Official Guide to Learning OpenGL®,Versions 3.0 and 3.1, Seventh Edition ***Chapter 2*** | | | |
| Week 11 | **UNIT 7: Representing 3D objCP** | | * ***Modeling using polygons*** * ***Techniques for creating representational polygonal meshes*** * ***Non-polygonal representations*** | | | |
| **End of week 11** | **Suggested Readings** | | 1. **James Foley, Andries van Dam, Steven Feiner, and John Huges***Computer Graphics: Principles and Practice (Second Edition in C.*) Addison-Wesley, 1997. ***Chapter 5, 6, 7*** | | | |
| Week 12 | **UNIT 8: Colors and Images** | | * ***Colour in Computer graphics RGB; CIE*** * ***mage formats and their applications: GIF, JPG, PNG.*** | | | |
| **End of week 12** | **Suggested Readings** | | 1. **David Shreiner**OpenGL® Programming Guide: The Official Guide to Learning OpenGL®,Versions 3.0 and 3.1, Seventh Edition ***Chapter 4*** | | | |
| Week 13, 14 | **UNIT 9: Viewing A local illumination model** | | * ***Using the camera model for viewing 3D scenes*** * ***Perspective and other types of projection*** * ***Viewing Types of light source*** * ***Reflectance models: diffuse (Lambert) and specular (Phong) Gouraud and Phong interpolation*** * ***Lighting and shading in OpenGL*** * ***Textures*** | | | |
| **Mid of week 14** | **Suggested Readings** | | 1. **David Shreiner**OpenGL® Programming Guide: The Official Guide to Learning OpenGL®,Versions 3.0 and 3.1, Seventh Edition ***Chapter 3*** | | | |
| Week 14, 15 | **UNIT 10: Application modeling** | | * ***Distinction between Modeling and graphics*** * ***Immediate mode versus retained mode Model*** * ***Storage Strategies*** * ***The matrix stacks*** * ***OpenGL display lists: traversal, Instancing*** * ***How the concepts are realized in specific systems: OpenGL, Java3D*** | | | |
| **End of week 15** | **Suggested Readings** | | **Any Graphics Books** | | | |
|  | week 16 | Final examination | | All chapters of the course included. Questions items are evenly distributed to all topics , especial focus made on the topics not covered under continuous assessments and mid examination | | | |
| Assessment:   * + As per University Legislative | | | | | | | |

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| **--------------**  **------------------**  **Information Technology Program** | | |
| **Module Number** | **15** | |
| **Module Name** | **Information Technology Research and Project** | |
| **Module CP** | **16** | |
| **Mode of Delivery** | **Parallel** | |
| **Module Description** | * In this module category three project related courses such as Basic Research Method in IT, Final year Project I, Final year Project II are included. The module will discover different topics of research and it attempts to define what research is, why we do research, and the various methods that researchers use to investigate problems. In addition different strategies and approaches to solve Industrial related problems will be exercised. | |
| **Module Competences** | * After completion of this module students will understand fundamental concepts and principles of writing research papers, enable students to apply their prior knowledge in identifying real world problems, analyze, design, implement, test and deploy IT projCP. It also enables them to identify recent research topics in IT, prepare and present seminars on such issues and develop the necessary skills of preparing and presenting IT seminars. | |
| **Module Objectives** | At the end of the module students will :   * Enable students to understand fundamental concepts and principles of writing research papers * Enable students to apply their prior knowledge in identifying real world problems, analyze, design, implement, test and deploy IT projCP * Enable students to identify recent research topics in IT, prepare and present seminars on such issues * Enable students to understand the basic skills of preparing and presenting IT seminars | |
| ***Courses in the Module*** | | |
| **Course Code** | **Course Name** | **CP** |
| ITec4151 | Internship | 3 |
| ITec4155 | Basic Research Method in IT | 3 |
| ITec4153 | Final year Project I | 5 |
| ITec4154 | Final year Project II | 5 |

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| **--------------**  **-------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4151 | | | | |
| **Course Title:** | Internship | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | **Information Technology Research and Project** | | | | |
| **Module Number** | 15 | | | | |
| **CP** | 3 | | | | |
| **Contact Hours (p** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 0 | 0 | 3 | 3 | 6 |
| **Target Group:** | 4th year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: I | | | | |
| **Pre-requisites** | ITec4141 | | | | |
| **Status of the Course** | Core | | | | |
| **Course Description** | This course helps the students to apply their knowledge acquired during the degree program. The students have to work practically and solve real time problems. During this internship the students should develop some projCP and develop their skills in the practical environment. After having successfully participated in this internship the students will learn how to solve the problems required in Industry and be sound in real technical problems. They can adopt him/her to the Industry standards and can work as a real life problem solver required from time to time in their later life. They should also acquire managerial skills in real working environments and other skills in running industries. | | | | |
| **Course Objective** | At the end of this course, students will be able to:   * Solve real world problem. * Familiarize with problem solving approaches. * Have managerial skills. | | | | |
| **Course content** | Depends on the industry and the type of project the student choose | | | | |
| **Methodology** | Students are eligible for Internship after they have successfully finished third year II semester. The internship will be carried out during the coming summer after third year accomplishment for 2 months. | | | | |
| **Assessment** | Students will submit the report and demonstration of what they have done during the Internship. A presentation of the project will be made before the beginning of the first semester of the fourth year. An assessment will be made based on:   * Jury evaluation * Advisor evaluation | | | | |
| **Reference** | Relevant books, Internet, company resources | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | | | |
| **Program** | Information Technology | | | | | | |
| **Course Code** | ITec4155 | | | | | | |
| **Course Title:** | Basic Research Methods in Information Technology | | | | | | |
| **Degree Program** | Information Technology | | | | | | |
| **Module Name** | **Information Technology Research and Project** | | | | | | |
| **Module Number** | 15 | | | | | | |
| **CP** | 3 | | | | | | |
| **Contact Hours (p** | **Lecture** | **Tutorial** | **Lab/Practical** | | **Home Study** | | **Total** |
| 2 | 0 | 0 | | 4 | | 6 |
| **Target Group:** | 4th year Information Technology Students | | | | | | |
| **Year /Semester** | Year: IV, Semester: I | | | | | | |
| **Pre-requisites** | None | | | | | | |
| **Status of the Course** | Core | | | | | | |
| **Course Description** | This course concerns us with the topic of research. It attempts to define what research is, why we do research, and the various methods that researchers use to investigate problems.  It is designed as an under-graduate introduction to research methodology. Students are assumed to be familiar with statistics (such as mean, standard deviation, percentiles, and other such terms). The course provides a framework for conceptualizing research and is meant to underpin the research project for the final year as well as for the projCP delivered for each subject. | | | | | | |
| **Course Objective** | At the end of this course, students will be able to understand:   * The terminologies used by professional researchers employing scientific thinking. * How to formulate a solid research hypothesis (research question). * the basic stages of research design * types of proposals and the contents of each * the issues covered in research ethics   the relationships that exist between variables in research design and the steps for evaluating those relationships | | | | | | |
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| **Content** | | | | **Lesson weeks** | | **Reference book** | | |
| **Brief Introduction about the Course** | | | | 1st Week | | Course guide book | | |
| **Chapter 1. THE NATURE AND SCOPE OF RESEARCH**   * What is research? * Research and theory * The Scientific approach * Stages of the research process * Components of a Research Proposal * Writing a Research Proposal | | | | 2nd,3rd week | | -Donald H. (PP 3-3)  -McBurney,(pp17-22)  -Marczyketal (pp19-32)  -Kothari (pp.1-24) | | |
| **Project will be given** | | | |  | |  | | |
| **Chapter 2: FORMULATION OF THE RESEARCH PROBLEM**   * Selection of a general topic * Literature review and the exploratory study * Specification of objectives and hypotheses * Concepts and variables | | | | 4th and 5th week | | Cooper, Donald  G. Marczyk  etal (pp 34-37)  -Kothari (pp.24-29) | | |
| * **Project Proposal Submission to the Instructor** * **Assignment I will be given to students** | | | |  | |  | | |
| **Chapter 3: The Research Process**   * **Major Steps in the Research process** | | | | 6th week | | Sing (pp.62-88) | | |
| **Chapter 4: The Research Design**   * Research Design * Sampling Methods * Measurement * Measurement scales * Instrument Design | | | | 7th, 8th and 9th week | | -Cooper, Donald  (pp306-326 and pp. 356-387)  -Kothari (pp.31-121 and pp.152-180)  -Sing (pp.88-121) | | |
| **Chapter 5: Analysis and Presentation of Data**   * Data presentation and description * Exploring, displaying , and examining data * Hypothesis testing * Measures of association * Report witting : Presenting insights and findings; Written and oral reports | | | | 10th , 11th and 12th week | | -Cooper, Donald  (Pp 437-570)  -Sing (pp.122-270)  - Kothari (pp.122-151 and pp. 184-360) | | |
| * Presentation of Assignments by students in Class will start (a random group may be asked to Presentation) | | | |  | |  | | |
| **Chapter 6: Current Research Topics in IS** | | | | 13th week | | -The Internet | | |
| **Chapter 7: Ethics in Research** | | | | 14th week | | Donald H. (pp.319-340) | | |
| Project Presentation | | | | 15th -16th Week | | ------ | | |
| Final Examination | | | |  | |  | | |
| **Assessment** | | | | * As per university Legislative | | | | |
| **References** | | | | 1. Cooper, Donald (2006). Business research methods, 9th Ed, McGraw-Hill 2. G. Marczyk, D. Demattoe, D. Festinger(2005). Essentials of research methodology and design. John Wiley and Sons, Inc. 3. Donald H. McBurney(1998). Research methods, 4th Redbooks/Cole Publishing Company. University of Pittsburgh. 4. Kothari, C.R. (2004), Research Methodology: Methods and Techniques, Second edition(Available in Soft Copy) 5. Sing, K. (2007), QUANTITATIVE SOCIAL RESEARCH METHODS, Sage Publications | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4153 | | | | |
| **Course Title:** | Final year Project I | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | **Information Technology Research and Project** | | | | |
| **Module Number** | 15 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 0 | 0 | 5 |  | 10 |
| **Target Group:** | 4rd year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: I | | | | |
| **Pre-requisites** | ITec4155 | | | | |
| **Status of the Course** | Core | | | | |
| Course Objective   * Identify problem areas in the industry * Learn how to gather requirement, analysis and design, a project and research on it. * During this internship the students should develop some project and develop their skills in the practical environment will learn how to solve the problems required in Industry and be sound in real technical problems   **Chapter one:** INTRODUCTION   1. Background  * Background of the organization * Mission, vision and objective of the organization for which you are going to develop the new system, etc…  1. Existing System Study    1. Describe how the existing system functions (manual, semi –automated, automated )    2. List and describe the problems in the existing system 2. Proposed System    1. Brief description of the proposed solutions for the problems mentioned in 3.b 3. OBJECTIVES OF THE PROJECT    1. General and specific objectives of the project. 4. Scope   Clearly show the functions (boundary) of your system that is expected to cover   1. Methodology    1. State how the requirements are gathered, the tools used for analysis and design, etc. ….   **Chapter Two:** SYSTEM FEATURES   1. Functional requirements    * + 1. User requirements  * List out all user requirements of the system. Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind. You may provide a short description of the feature/requirement and indicate whether it is of High, Medium, or Low priority. * Group the requirements into coherent set of categories like   + - 1. System requirements * Detail the requirements in section A using fully dressed use cases. This section should include a use case diagram and detailed use case descriptions.  1. Non Functional requirements    * + 1. List all the non functional requirements which are relevant to your system 2. Analysis Models   Select appropriate analysis model to understand the problems stated as requirements. Each model should include an introduction and a narrative description. Furthermore, each model should be traceable to the SRS’s requirements. Some of the models that you could use includes: DFD, activity diagram, sequence diagram etc  **Chapter Three:** SYSTEM DESIGN   1. Deployment Diagram   The deployment diagram should show   1. The physical communication links between hardware items (machines and other sources, such as printers) 2. The relationship between physical machine and processes – what runs where 3. Architectural Design   A software system is a set of communicating entities that collaborate to perform a task. The Architectural Design is a top level design which shows these entities, their relationships and the relationships. Each entity of the architectural design needs an abstract specification. The specification is a description of its purpose, its functionality, its attributes (including dependency on other entities) and the constraints under which it must operate. Class diagrams or structure charts may be used to represent architecture of a system.  **User Interface Design**  Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed.  **Data Structure Design**  Design in detail and specify the data structures to be used in the implementation. If these include databases, define the table structure of all databases including full field descriptions and all relations. Graphical languages like ER diagram are appropriate.  Algorithm Design  For the elements found in architectural design define the algorithm required for each element to accomplish its tasks  **Assessment**   * **Advisor evaluation** * **Jury evaluation** | | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | ITec4154 | | | | |
| **Course Title:** | Final year Project II | | | | |
| **Degree Program** | Information Technology | | | | |
| **Module Name** | **Information Technology Research and Project** | | | | |
| **Module Number** | 15 | | | | |
| **CP** | 5 | | | | |
| **Contact Hours** | **Lecture** | **Tutorial** | **Lab/Practical** | **Home Study** | **Total** |
| 0 | 0 | 5 | 5 | 10 |
| **Target Group:** | 4rd year Information Technology Students | | | | |
| **Year /Semester** | Year: IV, Semester: II | | | | |
| **Pre-requisites** | ITec4153 | | | | |
| **Status of the Course** | Compulsory | | | | |
| Final year Project II is implementation phase of Final year Project I.  **Assessment**   * **Advisor evaluation** * **Jury evaluation** | | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | Stat2171 | | | | |
| **Course Title:** | Introduction to Statistics | | | | |
| **Degree Program** | **Information Technology** | | | | |
| **Module Name** | **Basic Statistics** | | | | |
| **Module Number** | 17 | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | ***Lecture*** | ***Tutorial*** | ***Lab/Practical*** | ***Home Study*** | ***Total*** |
| 3 | 2 | 0 | 5 | 10 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: I | | | | |
| **Pre-requisites** | None | | | | |
| **Status of the Course** | General/Supportive | | | | |
| **Course Description** | History of statistics, Meaning of statistics; Methods of data collection; Methods of data presentation; Measures of location; Measures of variation; Moments, skewness and kurtosis; Sampling techniques; Simple linear regression, correlation and rank correlation. | | | | |
| **Course Objectives** | * To introduce students to the basic statistical knowledge (data collection and presentation methods, measures of central tendency and variation, regression and correlation). * To demonstrate the importance and usefulness of statistics in real life. * To show how to present data informatively and clearly. | | | | |
| **Course contents** | **Chapter 1.Introductions**  1.1) Definition & classifications  1.2) Method of data collection and organization  1.3) Method of data representation  **Chapter 2. Measures of Central Tendency**  2.1) Mathematical measures.  2.2) Positional measures.  2.3) The mode.  **Chapter 3.Measurs of Variation**  3.1) Positional measures  3.2) Mathematical Measures  3.3) Relative measures of variation  Solving all worksheets about three chapters  **Test one**  **Chapter 4. Elementary Probability theory.**  4.1)Introduction  **Mid –Exam**  4.2) Counting Rules.  4.3) Probability  4.4) Total of probability and Baye’sthoerem.  4.5) Random variables and probability distribution  **Chapter 5. Discrete Probability Distributions**  5.1) Mean & Variance of discrete probability distributions.  5.2) The binomial distribution  5.3) The Poisson distribution  **Chapter 6**. Continuous probability distribution.  6.1. Mean & variance of continuous variable  6.2. The normal distribution.  Tutorial Class about chapter 5.  **Chapter 7. Sampling Theory.**  7.1. Introduction to sampling theory  **Chapter 8. Statistical Inference**  8.1.Statistical Estimation of mean ( one sample mean & proportion)  8.2.Test of hypothesis ( one sample mean & proportion)  8.3. Tests of Association of attributes | | | | |
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| Assessment | As per University Legislative | | | | |
| Reference | 1. David, S.M., McCabe, P. and Craig, B. (2008). Introduction to the Practice of Statistics (6th edition). W.H. Freeman. 2. Freund, J.E and Simon, G.A. (). Modern Elementary Statistics (9th Edition). 3. Moore, D. S. (2007). The Basic Practice of Statistics (4th edition). W.H. Freeman and Company. 4. Spiegel, M.R. and Stephens, L.J. (2007). Schaum's Outline of Statistics, Schaum'sOutline Series (4th edition). McGraw-Hill. | | | | |

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| **--------------**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | Math2182 | | | | |
| **Course Title:** | Discrete Mathematics | | | | |
| **Degree Program** | **Information Technology** | | | | |
| **Module Name** | Discrete Mathematics | | | | |
| **Module Number** | **18** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | ***Lecture*** | ***Tutorial*** | ***Lab/Practical*** | ***Home Study*** | ***Total*** |
| 3 | 2 | 0 | 5 | 10 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: II, Semester: II | | | | |
| **Pre-requisites** | None | | | | |
| **Status of the Course** | General/Supportive | | | | |
| **Course Description** | Topics include Mathematical logic, set theory, relations and functions ,Boolean algebra, machine languages, fundamental principles of counting, principle of Inclusion-Exclusion, generating functions, recurrence relation, introduction to graph theory, trees. | | | | |
| **Course Objectives** | At the end of this course the students will be able to:   * Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations. * Learn various counting methods to solve complex problems. * Demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole principle. * Establish and solve recurrence relations that arise in counting problems * Illustrate by example basic terminology of graph theory and model problems in computer science using graphs and trees | | | | |
| **Course contents** | **Chapter 1**: **Introductory logic(8 hrs)**  1.1 Logical connectives  1.2 Tautology, contradiction and logicalequivalence  1.3 Quantified propositions  1.4 Argument and validity  **1.5** Methods of proof  Tutorial  **Chapter 2: Set theory (12 hrs)**   * 1. Introductory examples   2. Set operations   3. Relations and functions   4. Equivalence relations   5. Partially ordered sets   6. Introduction to Boolean Algebra   2.7 Formal machines and languages  Tutorial  **Chapter 3:Counting Methods (12hrs)**   * 1. Sum and product Rules   2. Permutations   3. Combinations   4. Binomial Theorem   5. Pigeon hole principle   6. Generating functions   Tutorial  **Chapter 4: Advanced counting methods**(**8 hrs)**  4.1 Inclusion-exclusion principle  4.2 Recurrence relations  4.3 Methods of solving recurrence relations  Tutorial  **Chapter 5: Introduction to graph theory (16 hrs)**   * 1. Definition and Examples   5.2 Matrix representation of graphs  5.3 Paths & connectivity  5.4 Planar Graphs  5.5 Graph coloring and chromatic polynomials  5.6 Eulerian and Hamiltonian graphs  5.7 Trees  5.8 Minimum spanning trees  5.9 Prim’s and Kruskal’s Algorithm  5.10 Dijkstra’s shortest path Algorithm  Tutorial | | | | |
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| Assessment | As per University Legislative | | | | |
| Reference | **Text**: R.Ellis and D.Gulick: Calculus with Analytic Geometry 5th edition  **Reference Materials**:   1. Leslie Hogben: Elementary Linear Algebra 2. Howard Anton: Elementary Linear Algebra 3. Howard Anton: Calculus with Analytic Geometry 5th edition | | | | |

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| **--------------**  **---------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | Eeng2161 | | | | |
| **Course Title:** | Fundamentals of Electricity and Electronics Device | | | | |
| **Degree Program** | **Information Technology** | | | | |
| **Module Name** | Electricity and Electronics | | | | |
| **Module Number** | **16** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | ***Lecture*** | ***Tutorial*** | ***Lab/Practical*** | ***Home Study*** | ***Total*** |
| 2 | 2 | 3 | 5 | 12 |
| **Target Group:** | 2nd year Information Technology Students | | | | |
| **Year /Semester** | Year: II Semester: I | | | | |
| **Pre-requisites** | None | | | | |
| **Status of the Course** | General/Supportive | | | | |
| **Course Description** | Introduction to metals, semiconductors, and insulators based on energy bands; Semiconductor theory; Types of Semiconductor Diodes: PN-junction diodes, Zener diodes, Other types of diodes; Bipolar Junction Transistors: Construction, Configuration, Input-output characteristics, and Equivalent circuit of transistors, Applications, Low frequency and high frequency analysis of transistors, Transistor biasing, Oscilloscopes, Function generators ,introduction to IC family, Characteristics of Digital ICs, Voltage , and Current Rating , Noise Margin , Propagation Delay , Power dissipation, TTL logic Family and Other Families, CMOS. | | | | |
| **Course Objectives** | Upon completion of this course, the students should have an understanding of:   * Fundamental concepts of electricity * The basic circuit parameters and variables * How to apply the fundamental circuit laws and theorems to analyze different electrical networks * Understand basic concepts of electronic circuits with the aid of lectures and laboratories * Understand sample applications and design guidelines of electronic circuits | | | | |
| **Course contents** | 1. **Basics of electricity**   1.1 Basic electricity and circuit theory  1.2 Circuit elements (Sources, Capacitor, Inductors, Resistors)  1.3 Electrical quantities  1.4 Resistor Combinations (**S,P,S-P, Y-Δ)**  1.5 Ohm’s law  1.6 Kirchhoff’s Voltage and Current law  1.7 Source Conversion and Other Basic Laws   1. **Network Analysis Theorems**   2.1 Nodal Analysis  2.2 Mesh Analysis   1. Alternating current and voltage 2. **Basic semiconductor theory**    1. Atomic theory, atomic structure    2. Semiconductor materials and their types,   atomic structure   * 1. Energy band gap diagram   2. Types of currents in semiconductor and current mechanisms   P and N type semiconductors   1. **Semiconductor diodes and their applications**    1. PN junction diode    2. Unbiased PN junction diode    3. Biased PN junction diode and Characteristics, ideal diode chxcs    4. Break down of a PN junction    5. Analysis of diode circuits,    6. Diode types,    7. Applications of diode circuits,       1. Rectification       2. Power supplies & Voltage regulators,   Clippers and clampers   1. **Bipolar junction transistors**    1. Introduction, Types of Transistors    2. Transistor structure/construction    3. Current components in transistors(principle of operation)    4. BJT Transistor circuit configuration and characteristics,    5. Transistor applications | | | | |
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| Assessment | As per University Legislative | | | | |
| Reference | **Text Books:**   1. **Boylestad,** Introduction to Circuit Analysis 2. **Boylestad**, Electronics Devices and Circuit Theory   **Others:**   1. Bogart, Electronic devices and circuit 2. Boylestad, Electronic device and circuit theory 3. Boylestad ,Introductory circuit analysis 4. Sedra, Microelectronic circuit | | | | |

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| **Course Title** | Anthropology of Ethiopian Societies and Cultures | | | | | | |
| **Module Title** | Common course | | | | | | |
| **Module Code** | 01 | | | Course Code: Anth1012 | | | |
| **CP** | 4 | | | | | | |
| **Study Hour** | Lecture: 2 | Laboratory: 0 | Tutorial: 0 | | | | Home Study: 6 |
| Mode of Delivery | Semester wise | | | | | | |
| Course Description | This course is designed to introduce the anthropology of Ethiopian societies and cultures to first year students' of Higher Learning Institutions (HLIs). It covers basic concepts of anthropology such as culture, society and humanity. It also discusses themes including unity and diversity, kinship, marriage and family; indigenous knowledge systems and local governance, identity, multiculturalism, conflict, conflict resolution and peacemaking system; intra and inter-ethnic relations of Ethiopian peoples. In addition, the course explores culture areas of Ethiopia such as plough culture, enset culture and pastoralism. The course further covers marginalized minority and vulnerable groups in terms of age, gender, occupation and ethnicity by taking ethnographic case studies into account and discuss ways of inclusive growth. | | | | | | |
| Learning Outcomes | Intended Learning Outcome: Up on the successful completion of thecourse, students will be able to:   * Develop an understanding of the nature of anthropology and its broader scope in making sense of humanity in a global perspective; ⎫ * Understand the cultural and biological diversity of humanity and unity in diversity across the worldand in Ethiopia;⎫ * Analyze the problems of ethnocentrism against the backdropof cultural relativism; ⎫ * Realize the socially constructed nature of identities & social categories such as gender, ethnicity, race and sexuality; ⎫ * Explore the various peoples and cultures of Ethiopia;⎫ * Understand the social,cultural, political, religious& economic life of different ethno-linguistic & cultural groups of Ethiopia; ⎫ * Understand different forms marginalization and develop skills inclusiveness;⎫ * Appreciate the customary systems of governance and conflict resolution institutions of the various peoples of Ethiopia;⎫ * Know about values, norms and cultural practices that maintain society together; ⎫ * Recognize the culture area of peoples of Ethiopia and the forms of interaction developed over time among themselves; and⎫ * Develop broader views and skills to deal with people from a wide variety of socio-economic and cultural backgrounds | | | | | | |
| **Course Content** | | | | | | | |
| **Topic** | | | | | Duration | References | |
| **Chapter 1: Introducing Anthropology and its Subjects**   * 1. What is anthropology–a Mirror for Humanity? * Sketching the subject matter, scope and concerns of anthropology * Anthropological imagination: asking questions and seeing the world anthropologically.   •Q-What does it mean by using the anthropological lens when looking at the world   * Defining Features of Anthropology-holism, relativism & comparative perspectives⎫ * Methods of Research in anthropology: ethnography & ethnographic methods   1. Sub-fields of Anthropology: Four Mirrors for Understanding Humanity   2. The relation between anthropology and other disciplines | | | | | **1-2** | **Text1** | |
| **Chapter 2:** **Human Culture and Ties that Connect**   * 1. Conceptualizing Culture: What Culture Is and What Culture Isn’t?   2. Characteristicsfeatures of culture: what differentiates culture from other traditions?   3. Aspects of Culture –Material & Non-material (values, beliefs & norms)   4. Levels of culture: universality, generality and particularity (cultural diversity)   5. Ethnocentrism, Cultural relativism, and human rights   6. Cultural Change: what is cultural change?   7. Ties that Connect: Marriage, Family and Kinship ⎫   8. Cultural practices, norms and values that maintain society together | | | | | **3-4** | **Text2: Chapter 1&2** | |
| **Chapter 3: Human Diversity, Culture Areas, and Contacting Ethiopia**   * 1. Human Beings & Being Human: What it is to be human? –(a bio-cultural animal?)   2. Origin of the Modern Human Species: Homo sapiens sapiens (that’s you!)   3. The Kinds of Humanity: human physical variation   4. Human Races: the history of racial typing Why is Everyone Different? Human Cultural Diversity -anthropological explanations   5. Culture areas and cultural contacts in Ethiopia      1. Plough culture area      2. Enset culture area      3. Pastoral societies culture area      4. Historical and social interactions between culture areas | | | | | **5-6** | **Text2: Chapter 3** | |
| **Chapter 4. Marginalized, Minorities, and Vulnerable Groups**  4.1.Gender based marginalization  4.2.Occupational cast groups  4.3.Age based vulnerability (children and old age issues)  4.4.Religious and ethnic minorities  4.5.Human right approaches and inclusive growth, anthropological perspectives | | | | | **7-8** | **Text2: Chapter 4** | |
| **Chapter 5: Theories of inter-ethnic relations and multiculturalism in Ethiopia**  5.1.The Scales of Human Identity: Who amI?-Understanding ‘self’ & ‘other’  5.2.Ethnicity and Race:What’s in a name?  5.3.Ethnic Groups & Ethnic Identity  5.4.Race–the social construction of racial identity 5.5.Primordialism; Instrumentalism; Social constructivism  5.6.Debates on inter-ethnic relations and identities | | | | | **9-10** | **Text2: Chapter 6** | |
| **Chapter 6:** Customary and local governance systems and peace making  6.1.Indigenous knowledge systems and local governance 6.2.Intra and inter-ethnic conflict resolution institution  6.3.Customary/Local governance systems  6.4.Legal pluralism: interrelations between customary, religious and state legal systems | | | | | **11** | **Text2: Chapter 7** | |
| Teaching Strategy | The course will be delivered in the form of lectures, demonstration, student presentations, group discussions, and individual and group project works. | | | | | | |
| Assessment Criteria | As per the academic regulation. | | | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | | | |
| Role of Instructor(s) | Delivers lectures, prepares reading assignments and topics for group discussion, prepares projects by discussion with student, gives consultation and advises students on project works and assignments, prepares and evaluates quiz, assignment, midterm and final examination. | | | | | | |
| Role of Students | Attend lectures and presentation, work in team on group work, participate in group discussion, discusses with the instructor on topics of interest for project work, delivers and presents project work, attend quiz, midterm and final examination. | | | | | | |
| Required software and/or hardware | None | | | | | | |
| **References** | 1.Asmarom Legesse (2006). Oromo Democracy: an Indigenous African Political System. The Red Sea Press, Inc.  2.Cameron, M. Smith and Evan T. Davies (2008). Anthropology for Dummies.Wiley Publishing, Inc., Indianapolis, Indiana.  3.Clifored Geertz . (1973). The Interpretation of Cultures. A division of Harper Collins Publishers.  4.Donald Donham . (1986). Marxist Modern. The Ethnographic History of Marxist Ethiopia.  5.Donald N. Levine. (1974). Greater Ethiopia: The Evolution of A Multiethnic Society. Chicago & London., University of Chicago.  6.Dunif-Hattis and Howard C. (1992). Anthropology: Understanding Human Adaptation. New York: Harper Collins, Inc.  7.Eriksen, T. H. (2001). Small Places, larger Issues: An introduction to social and cultural anthropology. London: Pluto Press.  8.Eriksen, T. H. (2004). What is anthropology? London: Pluto Press.  9.Eriksen, T. Hylland. (2002). Ethnicity and Nationalism. London; Pluto Press.  10.Eriksen, T.H. and Nielsen, F.S. (2001). A History of Anthropology. London: Pluto Press. | | | | | | |

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| Course Title | **Communicative English Skills II** | | | | | |
| **Module Title** | Common course | | | | | |
| **Module Code** | 01 | | | Course Code: EnLa 1012 | | |
| **CP** | 5 | | | | | |
| **Study Hour** | Lecture: 3 | Laboratory: 0 | Tutorial: 0 | | Home Study: 7 | |
| Mode of Delivery | Semester wise | | | | | |
| Course Description | Communicative English Skills I is a course designed to enable students to communicate in English intelligibly with acceptable accuracy, fluency and ability to use English appropriately in different contexts. The course exposess tudents to English language learning activities designed to help students use English for their academic and social needs. Students would be engaged in language learning development activities through doing and reflection on action. This includes grammar and vocabulary as used in communicative events and all skills and their sub-kills: speaking, listening, reading and writing. The language and skills are integrated where one becomes a resource to the other. There are six units covering topics related to the life world of students as well as of societal relevance | | | | | |
| Learning Outcomes | At the end of this course, students will be able to:  •Express themselves in social and academic events in English--Use English intelligibly with reasonable level of curacy and fluency  •Listen and comprehend to talks related to social and academic events given in English  •Read and understand texts written in English –texts on academic and social matters  •Write in English as academically and socially desirable.  •Learn and develop their English on their own—learning to learn: the language and the skills7 | | | | | |
| **Course Content** | | | | | | |
| **Topic** | | | | | | Duration |
| **Chapter 1:** Unite 1: Introducing Oneself   * 1. Section 1: Listening   Activity one  Introducing oneself (who you are, where you came from, where you finished your primary and secondary school), what you intend to study and why   * 1. Section 2: Reading   Activity one  Reading a short biography written in simple English: using background knowledge, reading with comprehension, making notes while reading, guessing meanings, attending to reference words & discussing notes,  Activity two  Reading a short deductive essay: taking notes while reading, discussing notes, guessing meaning while reading, identify ing descriptive words, using descriptive words in sentence writing | | | | | | **1-2**  **Text1** |
| **Chapter 2:**: Study Skills   * 1. Section 1: Listening   Activity one-  listening to a talk on haUniversity s of successful students: reflecting on one’s study skills, taking notes while listening, discussing notes, answering listening comprehension questions, discussing answers  Activity two-  Giving advice using tips from the listening text: using the language of giving advice   * 1. Section 2: Reading   Activity one-  Reading an expository essay on study skills: reading with comprehension, attending to new vocabulary, writing notes while reading, writing brief summaries from notes  Activity two  Studying the present perfect tense and the past perfect tense: form, use and meaning of conditionals | | | | | | **3-4**  **Text2: Chapter 1&2** |
| **Chapter 3:** Sports and Health   * 1. Section 1: Listening   Activity one-  Listening about ZinedineZidan (who he is, his childhood, his professional career): using prior knowledge (talking about a famous football player), predicting what comes next and checking prediction, taking notes while listening, discussing notes, presenting oral summary), asking and answering Wh-question  Activity two-  Studying conditionals (form,use and meaning)   * 1. Reading   Activity one-  Reading a short expository passage on sports and health: discussing how sports improve health, reading for main ideas, making notes while reading, developing notes into short summaries, comparing summaries  Activity two-  Working on vocabulary: using word formations | | | | | | **5-6**  **Text2: Chapter 3** |
| **Chapter 4.** Cultural Values   * 1. Section 1: Listening   Activity one-  Listening about cultural tourism: discussing how culture attracts tourists, listening with comprehension, taking notes while listening, discussing notes, developing notes into one-paragraph summaries   * 1. Section 2: Reading   Activity one-  Reading an expository text on cultural values: reading with comprehension, writing notes while reading, answering comprehension questions, summarizing the text based on notes made while reading, discussing summaries  Activity two-  Revision simple present, simple past, present perfect and past perfect tenses: revising form, use and meanings of these tenses, writing short meaningful sentences using simple present, simple past, present perfect and past perfect forms of verbs | | | | | | **7-8**  **Text2: Chapter 4** |
| **Chapter 5:** Tourism and Wildlife   * 1. Section 1: Listening-Listening about human-wildlife conflict (argumentative text):using prior knowledge, listening with comprehension, making notes while reading, writing summaries using the notes, discussing the summaries   2. Section 2: Reading   Activity one-Reading a text on tourism and wildlife: using visual, reading with comprehension, guessing meanings of words based on context, writing brief notes while reading, discussing notes and developing them into summaries, discussing summaries  Activity two-  Working on denotative and connotative meanings  Activity three-Revising conditionals: constructing meaningful sentences based on pictures | | | | | | **9-10**  **Text2: Chapter 6** |
| **Chapter 6:** Population   1. Section 1: Listening   Activity one-  Listening about population density: learning the meanings of ‘population’, ‘density’ and ‘population density’, predicting what comes in the talk and checking prediction, listening with comprehension, taking notes while listening, discussing notes, writing short paragraphs using the notes and discussing them Reading  Activity one-  Reading a text on population pyramid: interpreting tables, graphs and pie charts, reading with comprehension, making notes while reading, discussing notes, developing notes into paragraphs, discussing and improving paragraphs  Activity two-  Studying collocation: learning the definition of collocation, identifying words that collocate with ‘population’, doing exercise on collection, using collection in vocabulary study  Activity three-  Working on active and passive constructions (form, use, meaning): noticing grammar pattern in example sentences, listening to a brief lecture, writing lectures notes, discussing notes, identifying active and passive constructions, completing contextualized exercise, reading independently and compiling portfolio on passive constructions | | | | | | **11**  **Text2: Chapter 7** |
| Teaching Strategy | Short lectures •Pair and group work•Discussions•Presentations•Independent learning | | | | | |
| Assessment Criteria | As per the academic regulation. | | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | | |
| Role of Instructor(s) | Delivers lectures, prepares reading assignments and topics for group discussion, prepares projects by discussion with student, gives consultation and advises students on project works and assignments, prepares and evaluates quiz, assignment, midterm and final examination. | | | | | |
| Role of Students | Attend lectures and presentation, work in team on group work, participate in group discussion, discusses with the instructor on topics of interest for project work, delivers and presents project work, attend quiz, midterm and final examination. | | | | | |
| Required software and/or hardware | None | | | | | |
| References | 1. Alfassi, M. 2004. Reading to learn: Effects of combined strategy instruction on high schoolstudents. Journal of Educational Research, 97(4):171-184. 2. Anderson, N. 1999. Exploring second language reading: Issues and strategies.Toronto:Heinle&Heinle Publisher. 3. Bade, M. 2008. Grammar and good language learners.In C. Griffiths(Eds.). Lessons from good language learners(pp. 174-184). Cambridge University Press.https//doi.org/10.107/CBO9780511497667.016 4. Bouchard, M. 2005. Reading comprehension strategies for English language learners: 30research-based reading strategies that helpstudents read, understand and really learncontent from their textbooks and other nonfiction materials. New York: Scholastic. 5. Cameron, L. 2001. Teaching languages to young learners. Cambridge: Cambridge University Press. 6. Chamot, A.U. 1987. The learning strategies of ESL students. In A. Wenden & J. Rubin (Eds.). Learnerstrategies in language learning (PP 71-85). Prentice-Hall: Hemel Hempstead. 7. Gairns, R. & Redman, S. 1986. Working with words: A guide to teaching and learningvocabulary. Cambridge University Press. 8. Department of Foreign Language and Literature. 1996. College English (Volume Iand Volume II). Addis Ababa University Press. 9. McNamara, D.S. (Ed.). 2007. Reading comprehension strategies: Theories, interventions, andtechnologies. New York: Erlbaum. 10. Tilfarlioğlu, Y.2005. An Analysis of the relationshipbetweenthe use of grammar learning strategiesandstudent achievement at English preparatory classes.Journal of Language and Linguistic Studies 1:155-169. 11. Murphy R. (?). Essentials of English grammar in use: A self-study reference and practice book for intermediate students of English(2ndEd.).Cambridge University Press. 12. Murphy R. 2004. English grammar in use: A self-study reference and practice book for intermediate students of English(3rdEd.). Cambridge University Press. 13. Zhang, L. J. 2008.Constructivist pedagogy in strategic reading instruction:Exploring pathways to learner development in the English as a second language (ESL) classroom. Instructional Science, 36(2):89-116.https://doi.org/10.1007/s11251-007-9025-6Instructional Science, 36(2):89-116.https://doi.org/10.1007/s11251-007-9025-6 | | | | | |

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| Course Title | Introduction to Civics and Ethics | | | | | |
| **Module Title** | Common course | | | | | |
| **Module Code** | 01 | | | Course Code: CESt1011 | | |
| **CP** | 4 | | | | | |
| **Study Hour** | Lecture: 2 | Laboratory: 0 | Tutorial: 0 | | Home Study: 6 | |
| Mode of Delivery | Semester wise | | | | | |
| Course Description | This course is designed for undergraduate students with the aim of producing good citizens. It emphasizes on equipping learners with the necessary civic competence and active participation in public life. It will also help them to exercise their democratic rights and discharging their responsibilities effectively by familiarizing them with necessary civic knowledge and skills. In countries such as ours, where the process of cultivating modern constitutional and democratic values in the minds of citizens is experiencing seriouschallenges,largely because the country had no established civic culture and partly because these values and principles are not yet well-institutionalized,civics and ethicaleducation remains to be imperative. To this end, the course introduces learners to the basics of civics and ethics, citizenship, moralityand the goals of studying civics and ethics. It exposes studentsto the meanings, foundations, approaches, values and principles of ethics and civic virtue that learners must be equipped with both as citizens and professionals in their encounter with real life situations bothto be morally matured and responsible whilemaking decisions and taking actions. The course also elucidatethe nature, purpose and forms of state and government,constitution, democracy and human rights, the nature of democratic citizenship, modes of cultivating civic-virtues in our citizensmainly within the context of Ethiopia. | | | | | |
| Learning Outcomes | Upon a successful completion of this course, students will be able to:  •Understand the subject matter of Civics and Ethics;  •Cultivate certain moral values and civic virtues that enable them to be morally matured and competent in their professional and citizenry lives by practically exposing them to moral and civic debates/discussions and engagements.  •Develop such values/ virtues as recognition, appreciation and tolerance towards diversity and also build culture of peace  •Gain knowledge about the theoretical discourses and practices of state, government and citizenship, and their mutual interplay especially in the context of Ethiopia;  •Develop individual and/or collective potential of becoming self-confident citizens who can effectively participate in their legal-political, socio-economic and cultural lives;  •Understand the essences of such values and principles as democracy and human rights, multiculturalism and constitution and constitutionalism with especial reference to Ethiopia;  •Develop analytical and reflective skill of identifying global or national level development, democracy/governance and peace related issues of civics and ethics and then be able to produce or evaluate policies and practices in a civically and ethically responsible manner. | | | | | |
| **Course Content** | | | | | | |
| **Topic** | | | | | | Duration |
| **Chapter 1:** Understanding Civics and Ethics  1.1Defining Civics, Ethics, Morality and amorality  1.2The Origin and Development of Civics and ethical education  1.3The purpose of civics and ethical education  1.4Citizen: Rights and responsibilities  1.5Competences of good citizen | | | | | | **1-3** |
| **Chapter 2:** Approaches to Ethics  2.1Normative ethics  2.1.1Teleological Ethics (Consequentialist)  2.1.2Deontological Ethics (Non-Consequentialist  2.1.3Virtue Ethics and Civic Virtues  2.2Non-Normative Ethics  2.3Issues in Applied Ethics  2.3.1Development Ethics  2.3.2Environmental Ethics  2.3.3Professional Ethics | | | | | | **4-6**  **Text2: Chapter 1&2** |
| **Chapter 3:** Ethical Decision Making and Moral Judgments  3.1 Ethical Principles and Values of Moral Judgments  ♣The principle of equal consideration of interest  ♣Conflicting goals and ethical Justifications  ♣Ethical values and Justifiable exceptions  3.2Why Should I act ethically? | | | | | | **7-9** |
| **Chapter 4.** State, Government and Citizenship  ]4.1 Understanding State  ♣What is a state?  ♣Attributes of State  ♣State Structures  4.2 Understanding Government  ♣Major Function and Purpose of Government  ♣Types of Government: Limited and Unlimited  ♣Systems of Government 4.3 Understanding Citizenship  ♣What is Citizenship  ♣Inclusion and exclusion in Citizenship  ♣Ways of Acquiring Citizenship  ♣Ways of Losing Citizenship  ♣Citizenship in Ethiopian Context: Past and Present4.4State Formation and Nation-building in Ethiopian Context | | | | | | **10-11** |
| **Chapter 5:** Constitution, Democracy and Human Rights  5.1Constitution and Constitutionalism  ♣Peculiar features of Constitution  ♣Major Purpose and Functions of Constitution  ♣Classification of Constitutions  ♣The Constitutional Experience of Ethiopia: pre and post 1931  5.2Democracy and Democratization  ♣Definitions and Forms of Democracy  ♣Views on Democracy: Substantive and Procedural Views  ♣Fundamental Values and Principles of Democracy  ♣Democratization and Its Waves  ♣Major actors in Democratization Process  ♣Democracy and Good Governance in Ethiopia5.3Human Rights  ♣Definitions and Nature of Human Rights  ♣Basic Characteristics of Human Rights  ♣Dimensions of Human Rights  ♣The Protection and Promotion of Human Rights  -Human Rights Instruments: Documents  -Oversight Mechanisms: Institutions | | | | | | **12-16** |
| Teaching Strategy | Lectures, Group discussions, debates &Reflections | | | | | |
| Assessment Criteria | As per the academic regulation. | | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | | |
| Role of Instructor(s) | Delivers lectures, prepares reading assignments and topics for group discussion, prepares projects by discussion with student, gives consultation and advises students on project works and assignments, prepares and evaluates quiz, assignment, midterm and final examination. | | | | | |
| Role of Students | Attend lectures and presentation, work in team on group work, participate in group discussion, discusses with the instructor on topics of interest for project work, delivers and presents project work, attend quiz, midterm and final examination. | | | | | |
| Required software and/or hardware | None | | | | | |
| References | 1. Alexander, Larry (eds.).(1998). Constitutionalism: Philosophical Foundations. Cambridge: Cambridge University Press. 2. Assefa Fisseha. (2006). Federalism and Accommodation of Ethnic Diversity in Ethiopia: Comparative Study. Utrecht: Wolf Legal Publishers.Charles F. Kettering Foundation. & Harwood Group.1991. Citizens and politics: a view from Main Street America. 3. Dayton, Ohio: The Foundation. David S. Oderberg and Timothy Chapel. (2004). Human values , new essays on ethics and natural law palgravemacmillan, Great Britain. 4. Fasil Nahum. 1997. Constitution for a Nation of Nations: The Ethiopian Prospect. Lawrenceville,NJ: Red Sea Publishers. 5. FDRE. (1995). The Constitution of the Federal Democratic of Ethiopia. Federal NegarritGazeta: Addis AbebaFrancis Snare (1992). The Nature of Moral Thinking.Rutledge, U.S.A and Canada 6. Frechette,S. (1981). Environmental Ethics. U.S.A.: The Boxwood Press. 7. Goodin, Robert E. 2005. Reflective Democracy.Oxford University Press: New York. 8. James Paul and Clapham .1972. Ethiopian Constitutional Development: A source book.Haile Selassie I university: Addis Ababa. 9. Jeavons, T. (1991). Learning for the common good: liberal education, civic education,and teaching about philanthropy. Washington, DC: Association of American Colleges. 10. John M.Rist Real Ethics. (2004).Reconsidering the Foundations of MoralityCambridge university press U.K and U.S.A 11. Macedo, S. (2000). Diversity and distrust: civic education in a multicultural democracy. Cambridge, Mass: Harvard University Press.Melzer, A. M., education. Newark: University of Delaware Press. | | | | | |

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| Course Title | History of Ethiopia and the Horn | | | | | |
| **Module Title** | Common course | | | | | |
| **Module Code** | 01 | | | Course Code: Hist. 1012 | | |
| **CP** | 5 | | | | | |
| **Study Hour** | Lecture: 3 | Laboratory: 0 | Tutorial: 0 | | Home Study: 7 | |
| Mode of Delivery | Semester wise | | | | | |
| Course Description | This course isa common course given to Higher Learning Institutions Students/HLIS. Students will learn about the roleof history in human lifeand goals of studying history. Students will also learn the importance of history in nation building and the making of identity in time and space. This course covers the major historical processesin Ethiopia and the Horn. The course isalso concerned with how the socio-cultural, religious, economicandpoliticalexperiences of the past are interwoveninthe making of the current Ethiopiaand the Horn. It is useful to know howpersonalitieshelped change the scenario, and how societies, peoples and the world that we live in havechanged over time and its implication forhistory of Ethiopiaand the Horn.It is helpful to understand history as a base for shaping and bettering of the future. | | | | | |
| Learning Outcomes | The general objective of the course is to acquaint students with historical processes in Ethiopia. Specifically, after completing the course, students will be able to:   * ¬distinguish meaning, nature and uses of history * ¬identify pertinent sources for the history of the peoples of Ethiopia and the Horn * ¬describe changes & continuities that unfolded in Ethiopia and the Horn * ¬elucidate the causes, courses and consequences of events happened in the region * ¬explain the nature of the region’s external contacts and their effects * ¬appreciate peoples‟ achievements, heritages and cultural diversities of the region | | | | | |
| **Course Content** | | | | | | |
| **Topic** | | | | | | Duration |
| **Chapter 1: I**ntroduction  1.1.Concepts of History: Meaning, Nature and Uses  1.2. Sources & Methods of Historical Study  1.3. Origin and Development of Historiography of Ethiopia and the Horn  1.4. Introducing and Understanding Ethiopia and the Horn | | | | | | **1** |
| **Chapter 2:** Peoples and Cultures in Ethiopia and the Horn  2.1.Human Evolution  2.2.Neolithic Revolution  2.3.The Peopling of the Region  2.3.1.Languagesand Linguistic Processes: Afro-Asiatic Super Family (Cushitic, Semitic & Omotic Families) and Nilo-Saharan (Chari-Nile & Koman families)  2.3.2.Settlement Patterns  2.3.3.Economic Formations  2.4.Religion and Religious Processes  2.4.1.Indigenous  2.4.2.Judaism  2.4.3.Christianity  2.4.4.Islam | | | | | | **2-3** |
| **Chapter 3:** Polities, Economy & Socio-Cultural Processes in Ethiopia & the Horn to end of13thCentury  3.1.Evolution of States  3.2.Ancient Polities  3.2.1.North and Northeast  3.2.1.1.Punt  3.2.1.2.Damat  3.2.1.3.Axum  3.2.1.4.Zagwe  3.2.2.East, Central,SouthernandWestern  3.2.2.1.Agaw, Bizamo, Damot, Enaraya, Gafat.  3.2.2.2.Muslim Sultanates (Shewa, Ifat, Dawaro, Fatagar, Bali, Hadiya, Arebabani, Shirka, Dera...)  3.3.External Contacts  3.4.Economic Formations (Agriculture, Handicraft, Trade...)  3.5.Socio-cultural achievements (Architecture, Writing ...) | | | | | | **4-6** |
| **Chapter 4.** Politics, Economy &Socio-Cultural Processes from Late 13th–the beginning of16thCentury  4.1.“Restoration” of the “Solomonic‟‟ Dynasty  4.2.Power Struggle, Consolidation, Territorial and Religious Expansion of the Christian Kingdom  4.2.1.Succession Problem and the Establishment of Royal Prison  4.2.2.Territorial Expansion towards Agaw, Bizamo, Damot, Red Sea, Bete-Israel/“Falasha...”  4.2.3.Evangelization and Religious Movements  4.3.Social, Economic and Political Dynamics of Muslim Sultanates  4.3.1.Political Developments in the Muslim Sultanates and the Rise of Adal  4.3.2.Trade and the Expansion of Islam  4.4.Rivalry between the Christian Kingdom and the Muslim Sultanates  4.5.External Relations | | | | | | **7-8** |
| **Chapter 5:** Politics, Economy &Socio-Cultural Processes from Early 16th–the End of the 18thCentury  5.1.Interaction and Conflicts of the Christian Kingdom and the Sultanate of Adal  5.2.Foreign Interventions and Religious Controversies  5.3.Population Movements  5.3.1.Population Movements of the Afar, Somali and Argobba  5.3.2.Gadaa System and Oromo Population Movement (1522-1618)  5.4.Interaction and integration across ethnic and religious diversities  5.5.Peoples and States in Eastern, Central, Southern and Western Regions  5.5.1.Kushitic: Afar, Somali, Oromo, Sidama, Hadya, Kembata, Konso, Gedeo, Burji...  5.5.2.Semitic: Harari Emirate, Shewa Kingdom, Gurage Polity...  5.5.3.Omotic: Kaffa, Wolayita, Gamo Gofa, Dawro, Konta, Yem...  5.5.4.Nilotic: Anuak, Nuer, Berta, Gumuz...  5.6.The Period of Gondar (1636-1769) and “Zamana Mesafint/Era of Princes” (1769-1855)  5.6.1.The Revival of the Christian Kingdom  5.6.2.Gondar achievements: architecture, painting, music, literature, urbanization, trade etc.  5.6.3.Gondar Political Developments: “Close Door Policy,” Reforms, “Byzantine Politics”...  5.6.4.Major Features of Era of Princes (1769-1855) and Yejju Dynasty (1786-1853) | | | | | | **9-10** |
| **Chapter 6: Internal Interactions and External Relations from the 1800–1941**  6.1. The Nature of Interactions among peoples and statesof Ethiopia and the Horn  6.1.1. Peoples and sates of Kafa,Wollaitta, Gibe, Leqa, Qabena, Shawa...  6.1.2. The Role Trade and Trade Routes in the interaction  6.2. Power Rivalry  6.3. The Making of Modern Empire State (Territorial Expansion,Centralizationprocess...)  6.4. Modernization Attempts: administration, military, innovation, education, road construction, railway, transportation & communication, constitution...  6.5. Socio-Economic Issues/Processes: agriculture, disease & famine, trade, slavery, manufacturing...  6.6. External Relations, Challenges and Threats  6.6.1. ExternalDiplomatic Relationsand Treaties  6. 6. 2. The Major Battles (Meqdela, Gundet, Gura, Dogali, Mattama, Adwa, Maychew...)  6. 6. 3. Italian Occupation and thePatriotic Resistance | | | | | | **10-12** |
| **Unit 7: Internal Interactions and External Relations from the 1941–1994**  7.1. Post 1941 Imperial Period  7.1.1. Political Scene: Restoration &Consolidationof Imperial Power and External Relations  7.1.2. Socio-economic Conditions:agriculture & tenancy,famine, factories,education, health, transportation, religion, welfare institutions (idir, iqub...)  7.1.3.Opposition: Conspiracies, Revolts and Downfall of the Monarchical Regime  7.2. The DergRegime (1974-1991).  7.2.1. The Rise of Dergand the Political Momentum  7.2.2.Attempts at Reforms: Land Reform, Development through Cooperation Campaign,Collectivization, Agricultural Marketing Corporation, Resettlement, Villagization, Literacy...  7.2. 3.Internal oppositions, Ethio-Somali War, International Changes&End of the Derg  7.3.Historical Developments, 1991-1994(transitional charter:language & identityissues...) | | | | | | **13-14** |
| Unit 8: **Cross-Cutting Issues in History of Ethiopia and the Horn**  8.1. The Role of Women in Ethiopian History(economic, political, cultural and social)  8.2. Environmental Dynamics: changes and continuities (deforestation, drought, pollution...)  8.3. Indigenous Knowledge: education, folk medicine, conflict resolutionmechanisms(Makabanto, Shimigilinna, Yejoka, Samugnit, Guma, Luwa, Byto, Heer, Seera...) | | | | | | **15-16** |
| Teaching Strategy | This course will be delivered based on learner centered approach. Therefore, the main instructional strategies of the course are pair & group discussions; interactive teaching; brainstorming; icebreaker; debating & role-play. | | | | | |
| Assessment Criteria | As per the academic regulation. | | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | | |
| Role of Instructor(s) | Delivers lectures, prepares reading assignments and topics for group discussion, prepares projects by discussion with student, gives consultation and advises students on project works and assignments, prepares and evaluates quiz, assignment, midterm and final examination. | | | | | |
| Role of Students | Attend lectures and presentation, work in team on group work, participate in group discussion, discusses with the instructor on topics of interest for project work, delivers and presents project work, attend quiz, midterm and final examination. | | | | | |
| Required software and/or hardware | None | | | | | |
| References | 1. .Abir, Mordechai. Ethiopia and the Red Sea: The Rise and Decline of theSolomonic Dynasty and Muslim-European Rivalry in theRegion. Frankcass, 1980. 2. \_\_\_\_\_\_\_\_\_\_\_\_. Ethiopia:The Era of The Prince;The Challenge of Islam and The Re-unification of The Christian Empire 1769-1855.Institute of Asian & African Studies the Hebrew University, 1968. 3. Alberto, Sbacchi. Ethiopia under Mussolini: Fascism and the Colonial Experience.1985. 4. Alemayehu Haile et al. History of the Oromo to the Sixteenth Century. Finfinne: OCTB, 2006. 5. Andargachew Tiruneh. The EthiopiaRevolution 1974-1987: Transformation from Aristocracyto Totalitarian Autocracy. Cambridge University Press, 1993. 6. Asmarom Legesse. Gada: Three Approaches to Study of African Society. London: Free Press. 7. Bahru Zewde. A History of Modern Ethiopia, 1855-1991. Addis Ababa University Press. \_\_\_\_\_\_\_\_\_\_. Society, State and History, Selected Essays.Addis Ababa: AAU Pres, 2008. 8. Bender, M. L. and etal. Eds. The Languages of Ethiopia.London, 1976.Clark, J.D. The Prehistoric Cultures of the Horn of Africa.Cambridge University Press, 1954. 9. Crabtree J Pam &Campana V. Douglas.Archaeology and Pre-history.Gebru Tareke. Ethiopia Power and Protests: The Ethiopian Peasants Revolts in the 20thCentury.Cambridge University Press, 1991. 10. Gadaa Melbaa. Oromia. Minneapolis, 1999.Haberland,Eike. “Notes on the History of Southern Ethiopian Peoples.” Paris, 1975. 11. Marcus, Harold G. A History of Ethiopia. University of California Press: Berkeley, 1992. Mohammed Hassen. The Oromo of Ethiopia 1570-1860. Cambridge, 1990. 12. Pankhrust, Richard. 1997. The Ethiopian Borderlands: Essays in Regional History from AncientTimes to the end of the 18thCentury. Red Sea Press. 13. Rubenson, Sven. Survival of Ethiopian Independence. 1972. 14. Sergew Hable Selassie.Ancient and Medival Ethiopian History to 1270. Addis Ababa, 1972. 15. Shiferaw Bekele. EconomicHistory of Modern Ethiopia:Imperial Era 1941-1974. Vol. I. Dakar, 1995. Taddesse Tamrat. Church and State in Ethiopia, 1270-1527. Oxford, 1972.Teshale Tibebu. The Making of Modern Ethiopia, 1855-1974. The Red Sea Press, 1995. 16. Trimingham, J.Spencer. Islam in Ethiopia. London: Frankcass and Company LTD, 1965. | | | | | |

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| Course Title | Critical thinking | | | | | |
| **Module Title** | Common course | | | | | |
| **Module Code** | 01 | | | Course Code: LoCt 1011 | | |
| **CP** | 5 | | | | | |
| **Study Hour** | Lecture: 3 | Laboratory: 0 | Tutorial: 0 | | Home Study: 6 | |
| Mode of Delivery | Semester wise | | | | | |
| Course Description | Logic and Critical Thinking is an inquiry that takes arguments as its basic objects of investigation. Logic is concerned with the study of arguments, and it seeks to establish the conditions under which an argument may be considered acceptable or good. Critical thinking is an exercise, a haUniversity , a manner of perception and reasoning that has principles of logic as its fulcrum, and dynamically involves various reasoning skills that ought to be human approach to issues and events of life. To think critically is to examine ideas, evaluate them against what you already know and make decisions about their merit. The aim of logic and critical thinking course is to maintaining an ‘objective’ position. When you think critically, you weigh up all sides of an argument and evaluate its validity, strengths and weaknesses. Thus, critical thinking skills entail actively seeking all sides of an argument evaluating the soundness of the claims asserted and the evidence used to support the claims. This course attempts to introduce the fundamental concepts of logic and methods of logical reasoning. The primary aim of this course is to teach students essential skills of analyzing, evaluating, and constructing arguments, and to sharpen their ability to execute the skills in thinking and writing. | | | | | |
| Learning Outcomes | At the end of the course, studentsshould be able to:  ¬Understand the relationship of logic and philosophy,  ¬Recognize the core areas of philosophy,  ¬Appreciate the necessity learning logic and philosophy  ,¬Understandbasic logical concepts, arguments,  ¬Understand deductivness, inductiveness, validity, strength, soundness, and cogency,  ¬Develop the skill to construct sound argument and evaluate arguments;  ¬Cultivate the haUniversity s of critical thinking and develop sensitivity to clear and accurate usage of language;  ¬Differentiate cognitive meanings from emotive meanings of words,  ¬Apply symbols to denote standard forms of categorical propositions to form further logical assertions among them.  ¬Develop logical and open-mind that weighs ideas and people rationally;  ¬Develop confidence when arguing with others  ,¬Demonstrate logical argumentative ability,  ¬Develop logical reasoning skill in their day to day life, and  ¬Appreciate logical reasoning, disproving mob-mentality and avoid social prejudice.  ¬Understand the basic concepts and principles of critical thinking. ¬Understand the criterion of good argument.  ¬Identify the factors that affect critical thinking. ¬Apply critical thinking principles to real life situation. | | | | | |
| **Course Content** | | | | | | |
| **Topic** | | | | | | Duration |
| **Chapter 1:** Logic and Philosophy  1.1Introduction.  1.2Meaning and Definition of philosophy  1.3Core Branches of Philosophy.  1.4Importance of Learning Logic and Philosophy | | | | | | **1-2** |
| **Chapter 2:** Basic Concepts of Logic  2.1Introduction  2.2Basic Concepts of Logic  2.3Techniques of recognizing arguments.  2.4Types of Arguments  2.4.1Deductive Arguments  2.4.2Inductive Arguments  2.5Evaluation of Arguments  2.5.1Evaluating Deductive Argument  2.5.2Evaluating Inductive Arguments | | | | | | **3,4** |
| **Chapter 3:** Logic and  3.1Introduction  3.2Logic and Meaning  3.2.1Cognitive and Emotive Meaningof Words  3.2.2Intensional and Extensional Meaning of Terms  3.3Logic and Definition  3.3.1Types and Purposes of Definition  3.3.2Techniques of Definition  3.3.2.1Extensional Techniques of Definition  3.3.2.2Intensional Techniques of Definition Comment [G1]: added Comment [G2]: modified  3.4Criteriafor Lexical Definitions | | | | | | **5,6** |
| **Chapter 4.** Basic Concepts of Critical Thinking  4.1. Introduction  4.2. Meaning and Definition of Critical Thinking.  4.3. Principles of Critical Thinking.  4.4. Criterion/Standard of Argument Good Argument  .4.5. Factors Affecting Critical Thinking.  4.5. Relevance of Critical Thinking. | | | | | | **7,8,9** |
| **Chapter 5:** Logical Reasoning and Fallacies   * 1. 4.1Induction   2. 4.2Types of Fallacies: Formal and Informal4.3Categories of Informal Fallacies   3. 4.3.1Fallacies of Relevance   4. 4.3.2Fallacies of Weak Induction   5. 4.3.3Fallacies of Presumption   6. 4.3.4Fallacies of Ambiguity   7. 4.3.5Fallacies of Grammatical Analogy | | | | | |  |
| **Chapter 6:** Categorical Propositions   * 1. 5.1Introduction   2. 5.2Categorical Propositions   3. 5.2.1The Components of Categorical Propositions   4. 5.2.2Attributes of Categorical Propositions: Quality, Quantity, and Distribution   5. 5.2.3Representing Categorical Propositions   6. 5.2.3.1Venn Diagrams   7. 5.2.3.2Boolean and AristotelianSquare of Oppositions   8. 5.2.4Evaluating Immediate Inferences: Venn Diagrams and Square of Oppositions   9. 5.2.5Logical Operations: Conversion, Obversion, and Contraposition | | | | | | **9,11** |
| Teaching Strategy | The success of this course and students learning experience is dependent on active engagement and participation of the students in all the spectrum of the course. Students are expected to come well prepared/dressed and constructively engage in class. | | | | | |
| Assessment Criteria | As per the academic regulation. | | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | | |
| Role of Instructor(s) | Delivers lectures, prepares reading assignments and topics for group discussion, prepares projects by discussion with student, gives consultation and advises students on project works and assignments, prepares and evaluates quiz, assignment, midterm and final examination. | | | | | |
| Role of Students | Attend lectures and presentation, work in team on group work, participate in group discussion, discusses with the instructor on topics of interest for project work, delivers and presents project work, attend quiz, midterm and final examination. | | | | | |
| Required software and/or hardware | None | | | | | |
| References | **Textbook**   1. Hurley, Patrick J. (2014) A Concise Introduction to Logic,12th Edition, Wadsworth, Cengage Learning. 2. Hurley, Patrick J. (2012) A Concise Introduction to Logic,11th Edition, Wadsworth, Cengage Learning.   **Reference**   1. BooksCopi, Irving M.and Carl Cohen, (1990) Introduction to Logic,New York: Macmillan Publishing Company. 2. Damer, Edward. (2005). Attacking faulty reasoning. A practical guide to fallacy free argument. 3. Wadsworth Cengage learning, USA. Fogelin, Robert, J, (1987) Understanding Arguments: An Introduction to Informal Logic,New York: Harcourt Brace Jvanovich Publisher. 4. Guttenplan, Samuel: (1991) The Language of Logic. Oxford: Blackwell Publishers Stephen, C.(200) The Power of Logic. London and Toronto: Mayfield Publishing company. 5. Simico, N.D and G.G James. (1983) Elementary Logic,Belmont, Ca: Wadsworth Publishing Company.Walelign, Emuru, (2009) Freshman Logic, Addis Ababa. | | | | | |

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| Course Title | Physical fitness | | | | | |
| **Module Title** | Common course | | | | | |
| **Module Code** | 01 | | | Course Code: SpSc 1011 | | |
| **CP** | 5 | | | | | |
| **Study Hour** | Lecture: 0 | Laboratory: 2 | Tutorial: 0 | | Home Study: 6 | |
| Mode of Delivery | Semester wise | | | | | |
| Course Description | This course will provide the students with basic concepts of the five components of health related physical fitness (cardiovascular, muscular strength and endurance, flexibility, and body composition), conditioning, hypokinetic disease and general principles of training. It is mainly practical oriented. As a result, the students will be exposed to various exercise modalities, sport activities, minor and major games, and various training techniques as a means to enhance health related physical fitness components. In addition, they will develop the skills to assess each component of fitness and will practice designing cardiovascular, muscular strength and endurance, and flexibility programs based on the fitness assessment. The course serves as an introduction to the role of exercise in health promotion, fitness, performance including the acute and chronic responses of the body to exercise | | | | | |
| Learning Outcomes | 1. Recognize the immediate and long term responses of the body to various types of exercise. 2. Understands the basic concepts of physical fitness and conditioning exercises. 3. Understand the concept of hypokinetic disease and conditions. 4. Distinguish the general principles of fitness training 5. Develop conditioning programs to enhance the components of health related physical finesses. 6. Participate in conditioning programs which may help to develop the components of health related physical finesses. 7. Understand health issues in relation to excess body fatness and excessively low body fat. 8. Develop skills to assess health related physical fitness components. 9. Develop healthy body weight management skill. 10. Appreciate and value the benefits of regular physical exercise to healthy living. 11. Develop interest to engage in a regular physical exercise program as a life time activity. 12. Develop self-confidence and effective communication skills in and out of the school environment. | | | | | |
| **Course Content** | | | | | | |
| **Topic** | | | | | | Duration |
| **Chapter 1:** Concepts of physical fitness and conditioning  1.1.Meanings and definitions of terms  1.1.1.physical fitness  1.1.2.physical conditioning  1.1.3.Physical Activity,  1.1.4.Physical exercise and  1.1.5.Sport  1.2.General principles of fitness training | | | | | | **1-2** |
| **Chapter 2:** The Health Benefits of Physical Activity  2.1. Physical Activity and Hypokinetic Diseases/Conditions  2.2. Physical Activity and Cardiovascular Diseases  2.3. physical activity and postural deformity | | | | | | **3,4** |
| **Chapter 3:** Making Well-Informed Food Choices  3.1. Sound Eating Practices  3.2. Nutrition and Physical Performance | | | | | | **5,6** |
| **Chapter 4.** Health related components of fitness   * 1. Cardiovascular fitness      1. Meaning and concepts of cardiovascular fitness      2. Means and methods of developing cardiovascular fitness   2. Muscle fitness      1. Meaning and concepts of muscle fitness      2. Means and methods of developing muscle fitness   3. Flexibility      1. Meaning and types of flexibility      2. Means and methods of developing flexibility   4. Body composition      1. Meaning of body composition      2. Health risks associated with over fatness      3. .Health risks associated with excessively low body fatness | | | | | | **7,8,9** |
| **Chapter 5:** Assessment of fitness components  3.1. Assessment of cardiovascular fitness  3.2. Assessment of muscle fitness  3.3. Assessment of flexibility  3.4. Assessment of body composition | | | | | | **9,11** |
| **Chapter 5:** Development and Assessment of the health related components of fitness | | | | | | **12-16** |
| Teaching Strategy | The success of this course and students learning experience is dependent on active engagement and participation of the students in all the spectrum of the course. Students are expected to come well prepared/dressed and constructively engage in class. | | | | | |
| Assessment Criteria | As per the academic regulation. | | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | | |
| Role of Instructor(s) | Delivers lectures, prepares reading assignments and topics for group discussion, prepares projects by discussion with student, gives consultation and advises students on project works and assignments, prepares and evaluates quiz, assignment, midterm and final examination. | | | | | |
| Role of Students | Attend lectures and presentation, work in team on group work, participate in group discussion, discusses with the instructor on topics of interest for project work, delivers and presents project work, attend quiz, midterm and final examination. | | | | | |
| Required software and/or hardware | None | | | | | |
| References | 1. Schott k. Powers, Stepheen L. Dod and Virginia J. (2006), Total Fitness and Wellness. 2. Paul M, and Walton T. (2006), Core Concepts in Health, 10thedit. 3. Charles B. Corbin and Ruth Lindsey (1990), Fitness for life, 3rdEdition, Scott | | | | | |

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| Course Title | Basic Mathematics for Natural Sciences | | | | | |
| **Module Title** | Common course | | | | | |
| **Module Code** | 01 | | | Course Code: Hist. Math1014 | | |
| **CP** | 5 | | | | | |
| **Study Hour** | Lecture: 3 | Laboratory: 0 | Tutorial: 2 | | Home Study: 5 | |
| Mode of Delivery | Semester wise | | | | | |
| Course Description | The course intends to prepare natural science students with the basic concepts and materials from mathematics that necessitate a good foundation to treat fundamental mathematical tools in science. This course rigorously discusses the basic concepts of logic and set theory, the real and complex number systems, mathematical induction, least upper bound and greatest lower bound, functions and types of functions, polynomial and rational functions, logarithmic and exponential functions, trigonometric functions, hyperbolic functions and their graphs and analytic geometry. | | | | | |
| * Course objectives Learning Outcomes | * After completion of the course, students will be able to: * ⎫apply propositional logic in reasoning, * ⎫use quantifiers in open propositionsin mathematical logic * ⎫understand concepts of sets and set operations, * ⎫understand the fundamental properties of real numbers * ⎫use mathematical induction in proofs, * ⎫analyzeleast upper bound and greatest lower bound, * ⎫understand the fundamental properties of complex numbers * ⎫express complex numbers in polar representation * ⎫explaindifferent types of functions, their inverses andtheir graphs * ⎫evaluate zeros of polynomials * ⎫Understandbasic properties of logarithmic, exponential, hyperbolic, and trigonometric functions * ⎫Understand basic concept of analytic geometry * ⎫derive equations of conic sections | | | | | |
| **Course Content** | | | | | | |
| **Topic** | | | | | | Duration |
| **Chapter 1:** Propositionallogic and Set Theory  1.1.Definition and examples of proposition  1.1.1Logical connectives  1.1.2Compound (or complex) propositions  1.1.3Tautology and contradiction  1.1.4Open proposition and quantifiers  1.2. Set theory  1.2.1 The concept of a set  1.2.2Description of sets  1.2.3. Set operations and Venn diagrams | | | | | | **1-2** |
| **Chapter 2:** The realand complex number systems  2.1 The real number system  2.1.1. The natural numbers, Principle of mathematical induction and the Well ordering Principle 2.1.2. The integers, rational numbersand real numbers.  2.1.3. Upper bound and lower bound: least upper bound and greatest lower bound; Completeness property of real numbers  2.2. Complex number system  2.2.1. Definition of complex numbers and theiroperations  2.2.2. Polar representation of complex numbers and the De-Moivere’s formula  2.2.3. Extraction of roots | | | | | | **3-5** |
| **Chapter 3:** Functions  3.1. Review of relations and functions  3.2. Real-valued functions and their properties  3.3. Types of functionsand inverse of a function  3.4. Polynomials, zeros of polynomials, rational functions, and their graphs  3.5. Definitions and basic properties oflogarithmic, exponential,trigonometricand hyperbolic functions, and their graphs. | | | | | | **6-9** |
| **Chapter 4.**  Analytic Geometry  4.1 The straight-line: Division of segments and various forms of equation of a line.  4.2. Circles  4.2.1. Definition of circle and examples  4.2.2. Equation of a circle centre at the origin and different from the origin.  4.2.3. Intersection of a circle andaline  4.3. Parabola  4.3.1. Definition of parabola and standard form of equation of parabola.  4.3.2. Equation of parabola parallel to the x-axis (the y-axis)  4.4. Ellipse  4.4.1. Definition of Ellipseand examples  4.4.2. Equation of ellipse centre at the origin and different from the origin  4.5 Hyperbola  4.5.1. Definition of circle and examples  4.5.2. Equation of hyperbola of center at the origin transverse axis to x-axis (the y-axis | | | | | | **10-14** |
| Teaching Strategy | This course will be delivered based on learner centered approach. Therefore, the main instructional strategies of the course are pair & group discussions; interactive teaching; brainstorming; icebreaker; debating & role-play. | | | | | |
| Assessment Criteria | As per the academic regulation. | | | | | |
| Attendance | Lecture: 85%, Laboratory : 100% | | | | | |
| Role of Instructor(s) | Delivers lectures, prepares reading assignments and topics for group discussion, prepares projects by discussion with student, gives consultation and advises students on project works and assignments, prepares and evaluates quiz, assignment, midterm and final examination. | | | | | |
| Role of Students | Attend lectures and presentation, work in team on group work, participate in group discussion, discusses with the instructor on topics of interest for project work, delivers and presents project work, attend quiz, midterm and final examination. | | | | | |
| Required software and/or hardware | None | | | | | |
| References | 1. Abera Abay, An Introduction to Analytic Geometry, AAU,1998 2. Alemayehu Haile and Yismaw Alemu, Mathematics an Introductory Course, Department of Mathematics, AAU | | | | | |

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| **Course Code** | | EmTe1012 | | | | | | | |
| **Course Title:** | | **Introduction to Emerging Technology** | | | | | | | |
| **Degree Program** | | Information Systems | | | | | | | |
| **Module Code** | | **01** | | | | | | | |
| **Module Name** | | **Common course** | | | | | | | |
| **ECTS Credits (CP)** | | 5 | | | | | | | |
| **Contact Hours (per week)** | | **Lecture** | **Tutorial** | **Lab/Practical** | | **Home Study** | | **Total** | |
| 2 | 3 | 0 | | 5 | | 10 | |
| **Pre-requisites** | |  | | | | | | | |
| **Mode of delivery** | | Semester wise | | | | | | | |
| **Status of the Course** | | Compulsory | | | | | | | |
| Course description | | This course will enable students to explore current breakthrough technologies in the areas of Artificial Intelligence, Internet of Things and Augmented Reality that have emerged over the past few years. Besides helping learners become literate in emerging technologies, the course will prepare them to use technology in their respective professional preparations. | | | | | | | |
| Course objective | | Upon completing this module, you will be able to: ➢ Identify different emerging technologies ➢ Differentiate different emerging technologies ➢ Select appropriate technology and tools for a given task ➢ Identify necessary inputs for application of emerging technologies | | | | | | | |
| **week** | | **Content & sub-content** | | | **Methods and strategies** | | **Students Task** | | |
| 1-2 | | UNIT 1: Introduction to Emerging Technologies  1.1. Evolution of technologies  1.1.1. Introduction to Industrial  revolution  1.1.2. Historical background (IR 1.0, IR 2.0, IR 3.0)  1.1.3. Fourth industrial revolution (IR 4.0)  1.2. Role of data for Emerging technologies  1.3. Enabling devices and networks for technologies (programmable devices)  1.4. Human to Machine Interaction  1.5. Future trends in emerging technologies | | | • Listening  • Note-taking  • Brainstorming  • Reading  •Individual work  •Group discussion  • Reflections  •Gapped Lecture | | • Attend the lesson • Listen and take notes  • Answer questions • Read  •Doing class works and  home works,  • Reflects | | |
| 3-4 | | Unit 2: Introduction to Data Science  2.1. Overview for Data Science  2.1.1. Definition of data and information  2.1.2. Data types and representation  2.2. Data Value Chain  2.2.1. Data Acquisition  2.2.2. Data Analysis  2.2.3. Data Curating  2.2.4. Data Storage  2.2.5. Data Usage  2.3. Basic concepts of Big data | | | * Listening * Note-taking * Brainstorming * Gapped Lecture * Group discussion * Class work * Tutorials | | * Attend the lesson * Listen and take short notes, * Asking and answering questions, * Doing class works and home works, * Participating in group discussions. * Reflects | | |
| 5-7 | | Unit 3: Artificial Intelligence (AI)  3.1. Introduction to AI  3.1.1. What is AI  3.1.2. History of AI  3.1.3. Levels of AI  3.1.4. Types of AI  3.2. Applications of AI  3.2.1. Agriculture  3.2.2. Health  3.2.3. Business (Emerging market)  3.2.4. Education  3.3. AI tools and platforms (eg: scratch/object tracking)  3.4. Sample application with hands on activity (simulation based) | | | * Listening * Note-taking * Brainstorming * Gapped Lecture * Group discussion * Class work * Tutorials * Reflections | | * Listening * Note-taking * Brainstorming * Gapped * Lecture * Group discussion * Class work * Tutorials Reflections | | |
| 8-10 | | Unit 4: Internet of Things (IoT)  4.1. Overview of IoT  4.1.1. What is IoT?  4.1.2. History of IoT  4.1.3. Advantage of IOT  4.1.4. Challenges of IOT  4.2. How IOT works  4.2.1. Architecture of IOT  4.2.2. Devices and network  4.3. Applications of IOT  4.3.1. Smart home  4.3.2. Smart grid  4.3.3. Smart city  4.3.4. Wearable devices  4.3.5. Smart farming  4.4. IOT tools and platforms (eg: KAA IoT /Device Hive/Zetta/Things Board…)  4.5. Sample application with hands on activity (eg IOT based smart farming) | | | * Listening * Note-taking * Brainstorming * Reading * Individual work * Group discussion \ * Reflections * Gapped Lecture | | •Attend the lesson  • Listen and take short notes,  •Asking and answering questions,  • Doing class works and home works,  • Participating in group discussions. • Reflects | | |
| 11-12 | | Unit 5: Augmented Reality (AR)  5.1. Introduction to AR  5.2. Virtual reality (VR), Augmented Reality (AR) vs mixed reality (MR)  5.3. Architecture of AR systems.  5.4. Application of AR systems (education, medical, assistance, entertainment) workshop-oriented hands demo | | | * Listening * Note-taking * Brainstorming * Reading * Individual work * Group discussion * Reflections * Gapped Lecture | | • Attend the lesson • Listen and take short notes,  • Asking and answering questions,  • Doing class works and home works,  • Participating in group discussions. • Reflect | | |
| 13 | | Unit 6: Ethics and professionalism of emerging technologies  6.1. Technology and ethics  6.2. Digital privacy  6.3. Accountability and trust  6.4. Treats and challenges | | | * Listening * Note-taking * Brainstorming * Reading * Individual work * Group discussion * Reflections * Gapped Lecture | | • Attend the lesson • Listen and take short notes,  • Asking and answering questions,  • Doing class works and home works,  • Participating in group discussions. • Reflect | | |
| 14-15 | | Unit 7: Other Emerging Technologies  7.1. Nanotechnology  7.2. Biotechnology  7.3. Blockchain technology  7.4. Cloud and quantum computing  7.5. Autonomic computing  7.6. Computer vision  7.7. Embed systems  7.8. Cyber security  7.9. Additive manufacturing (3D Printing) Etc. … | | | * Listening * Note-taking * Brainstorming * Reading * Individual work * Group discussion * Reflections * Gapped Lecture | | • Attend the lesson • Listen and take short notes,  • Asking and answering questions,  • Doing class works and home works,  • Participating in group discussions. • Reflect | | |
| 13-16 | |  | | |  | |  | |  |
| Assessment Criteria | | Quiz ….12%  Individual Assignment …….11%  Group Assignment……12%  Mid exam…………….25%  Final Exam…………..40% | | | | | | | |
| Attendance | | Lecture: 85%, Laboratory : 100% | | | | | | | |
| **Course Policy:** | | All students are expected to abide by the code of conduct of students (article 166 and 166.1.1, of The Senate Legislation of University Name May 20, 2005) throughout this course. Academic dishonest including cheating, fabrication, and plagiarism will not be tolerated at any stage during your studies and will be reported to concerned bodies for action. If you need it you can get a copy (to be copied by yourself) of it from your academic advisor.  It is expected that all work handed in by a student will be original work that has been done by the individual. If it is not, then this act of intellectual dishonesty will be dealt with severely.  While students are expected to work reasonably independently, I do not expect you to work in isolation. Often you learn best when working with others on an assignment. So what degree of collaboration is expected and, indeed, encouraged, and what is deemed to be cheating? If you are having problems with the assignments or tests, contact the instructor as soon as possible. It will NOT be possible to earn extra credit to improve a poor grade at the end of the semester.  In general, we encourage things like bouncing ideas off one another, discussing which of two alternate solutions might be better (and why), and getting another's ideas on how to resolve a difficulty that you have already spent time on. However, you should not be working so closely together that someone else's solution becomes incorporated into your answer, computer program or other submission. These general guidelines apply to any type of assignment and project.  You are expected to attend class regularly. I will take attendance on random days during the semester to ensure that the students are coming to class and if you miss class repeatedly, your grade will be affected. If you miss more than 80% of the class attendance you will not sit for final exams. Please try to be on time for class. I will not allow you enter if you are late for more than five minutes. | | | | | | | |
| Textbook | |  | | | | | | | |
| **Reference Materials** | | * Follett, J. (2014). Designing for Emerging Technologies: UX for Genomics, Robotics, and the Internet of Things: O'Reilly Media. * Vong, J., & Song, I. (2014). Emerging Technologies for Emerging Markets: Springer Singapore. * Francesco Corea. Artificial Intelligence and Exponential Technologies: Business Models Evolution and New Investment Opportunities, 2017. | | | | | | | |

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| **Course Code** | | GeES 1012 | | | | |
| **Course Title:** | | **Geography of Ethiopia and the Horn** | | | | |
| **Degree Program** | | Information Systems | | | | |
| **Module Code** | | **01** | | | | |
| **Module Name** | | **Common course** | | | | |
| **ECTS Credits (CP)** | | 5 | | | | |
| **Contact Hours (per week)** | | **Lecture** | **Tutorial** | **Group Work/ Discussion and Presentation** | **Home Study** | **Total** |
| 48 hrs | 0 | 35 hrs | 52 | 135 hrs |
| **Pre-requisites** | |  | | | | |
| **Mode of delivery** | | Semester wise | | | | |
| **Status of the Course** | | Compulsory | | | | |
| Course description | | This course attempts to familiarize students with the basic geographic concepts particularly in relation to Ethiopia and the Horn of Africa. It is also intended to provide students a sense of place and time (geographic literacy) that are pivotal in producing knowledgeable and competent citizens that are able to comprehend and analyze problems and contribute to their solutions. The course consists of four parts. The first part provides a brief description on the location, shape and size of Ethiopia as well as basic skills of reading maps. Part two introduces the physical background and natural resource endowment of Ethiopia and the Horn which includes its geology and mineral resources, topography, climate, drainage and water resources, soil, fauna and flora. The third part of the course focuses on the demographic characteristics of the country and its implications on economic development. The fourth component of the course offers treatment of the various economic activities of Ethiopia and the Horn which include agriculture, manufacturing and service sectors. Moreover, Ethiopia in a globalizing world is treated in the perspectives of the pros and cons of globalization on its natural resources, population and socio economic conditions. | | | | |
| Course objective | | Upon completion of this course the students will be able to:   * Describe the location, shape and size of Ethiopia and the Horn * Explain the implications of location, shape and size of Ethiopia and the Horn on the physical environment, socioeconomic and political aspects. * Elaborate the major geological events; the resultant landforms and mineral resources of Ethiopia and the Horn. * Identify the major drainage systems and water resources of Ethiopia and their implications for regional development and integration. * Develop an understanding of the climate of Ethiopia, its dynamics and implications on the livelihoods of its inhaUniversity ants. * Examine the spatio-temporal distribution and abundance of natural vegetation, wildlife and Soil resources of Ethiopia. * Discuss the demographic attributes and dynamics as well as the ethnic diversity of Ethiopia. * Read maps as well as compute basic demographic and climatic rates * Appreciate the biophysical and socio-cultural diversities in Ethiopia and the Horn * Explicate the major types of economic activities in Ethiopia; discern their spatiotemporal distributions and their contributions to the overall development of the country. * Comprehend the effects of globalization on the socioeconomic development of Ethiopian and the Horn. | | | | |
| Learning outcome | | * Acquire basic knowledge on the geographic attributes of Ethiopia and Horn * Develop a sense of appreciation and tolerance of cultural diversities and their interactions * Acquire general understanding of physical geographic processes, and human-environment relationships * Develop ethical aptitudes and dispositions necessary to live in harmony with the natural environment * Develop an understanding of national population distributional patterns and dynamics * Conceptualize the comparative advantages of economic regimes; and understand the impacts of globalization. * Understand their country’s overall geographic conditions and opportunities; and be proud of the natural endowments and cultural richdom that help them develop a sense of being an Ethiopian. | | | | |
| **week** | | **Content & sub-conte** | | | | |
| 1 & 2 | | **I. INTRODUCTION (5 hrs)**  1.1. Geography: Definition, scope, themes and approaches  1.2. Location, Shape and Size of Ethiopia and the Horn  1.2.1. Location and its effects 1.2.2. The shape of Ethiopia and its implication  1.2.3. The size of Ethiopia and its implications  1.3. Basic Skills of Map Reading | | | | |
| 3&4 | | CHAPTER TWO: THE GEOLOGY OF ETHIOPIA AND THE HORN (5hrs)  2.1. Introduction  2.2. The Geologic Processes: Endogenic and Exogenic Forces  2.3. The Geological Time scale and Age Dating Techniques  2.4. Geological Processes and the Resulting Landforms  2.4.1. The Precambrian Era geologic processes and resultant features  2.4.2. The Paleozoic Era geologic processes and resultant features  2.4.3. The Mesozoic Era geologic processes and resultant features  2.4.4. The Cenozoic Era geologic processes and resultant features  2.5. Rock and Mineral Resources of Ethiopia | | | | |
| 5&6 | | CHAPTER THREE: THE TOPOGRAPHY OF ETHIOPIA AND THE HORN (3hrs) 3.1. Introduction  3.2. Physiographic Divisions  3.2.1 The Western Highlands and Lowlands  3.2.2 The Southeastern Highlands and Lowlands  3.2.3 The Rift Valley  3.3. The Impacts of Relief on Biophysical and Socioeconomic Conditions | | | | |
| 5-6 | | CHAPTER FOUR: DRAINAGE SYSTEMS AND WATER RESOURCES OF ETHIOPIA AND THE HORN (5hrs)  4.1. Introduction  4.2. Major Drainage Systems of Ethiopia  4.3. Water Resources: Rivers, Lakes, and Subsurface Water  4.4. General Characteristics of Ethiopian Rivers  4.5. Water Resources Potentials and Development in Ethiopia | | | | |
| 7-9 | | CHAPTER FIVE: THE CLIMATE OF ETHIOPIA AND THE HORN (7hrs)  5.1. Introduction  5.2. Elements and Controls of Weather and Climate  5.3. Spatiotemporal Patterns and Distribution of Temperature and Rainfall in Ethiopia 5.4. Agro-ecological Zones of Ethiopia  5.5. Climate and its Implications on Biophysical and Socioeconomic Aspects  5.6. Climate Change/Global Warming: Causes, Consequences and Response Mechanisms | | | | |
| 9-11 | | CHAPTER SIX: SOILS, NATURAL VEGETATION AND WILDLIFERESOURCES OF ETHIOPIA AND THE HORN (6hrs)  6.1. Introduction  6.2. Ethiopian Soils: Types, Degradation and Conservation  6.3. Types and Distribution of Natural Vegetations in Ethiopia  6.4. Natural vegetation: Uses, Degradation and Conservation Strategies  6.5. Wildlife Resources of Ethiopia: Types, Importance, and Conservation Strategie | | | | |
| 12 &13 | | CHAPTER SEVEN: POPULATION OF ETHIOPIA AND THE HORN (8hrs)  7.1. Introduction  7.2. Population Data: Uses and Sources  7.3. Population Dynamics: Fertility, Mortality and Migration  7.4. Population Distribution and Composition  7.5. Sociocultural Aspects of Ethiopian Population: Education, Health and Languages  7.6. Settlement Types and Patterns | | | | |
| 14-16 | | CHAPTER EIGHT: ECONOMIC ACTIVITIES IN ETHIOPIA (9hrs)  8.1. Introduction  8.2. Mining, Fishing and Forestry  8.3. Agriculture in Ethiopian  8.3.1. Contributions, potentials and characteristics of agriculture in Ethiopia  8.3.2. Agricultural systems in Ethiopia  8.3.3. Major problems of Ethiopian agriculture  8.4. Manufacturing in Ethiopia  8.4.1. Manufacturing: essence and contributions  8.4.2. Types, characteristics and distribution of manufacturing  8.4.3. Industrial development in Ethiopia: Challenges and Prospects  8.5. The Service Sector in Ethiopia  8.5.1. Transportation and communication in Ethiopia: types, roles and characteristics 8.5.2. Trade in Ethiopia: types, contributions and characteristics  8.5.3. Tourism in Ethiopia: Types, major tourist attraction sites, challenges and prospects | | | | |
| Teaching methodology | | Gap Lecture, Peer/ group Discussion and Reflection, Reading Assignment | | | | |
| Assessment Criteria | | Quiz ….12%  Individual Assignment …….11%  Group Assignment……12%  Mid exam…………….25%  Final Exam…………..40% | | | | |
| Attendance | | Lecture: 85% | | | | |
| **Course Policy:** | | All students are expected to abide by the code of conduct of students (article 166 and 166.1.1, of The Senate Legislation of University Name May 20, 2005) throughout this course. Academic dishonest including cheating, fabrication, and plagiarism will not be tolerated at any stage during your studies and will be reported to concerned bodies for action. If you need it, you can get a copy (to be copied by yourself) of it from your academic advisor.  It is expected that all work handed in by a student will be original work that has been done by the individual. If it is not, then this act of intellectual dishonesty will be dealt with severely.  While students are expected to work reasonably independently, I do not expect you to work in isolation. Often you learn best when working with others on an assignment. So what degree of collaboration is expected and, indeed, encouraged, and what is deemed to be cheating? If you are having problems with the assignments or tests, contact the instructor as soon as possible. It will NOT be possible to earn extra credit to improve a poor grade at the end of the semester.  In general, we encourage things like bouncing ideas off one another, discussing which of two alternate solutions might be better (and why), and getting another's ideas on how to resolve a difficulty that you have already spent time on. However, you should not be working so closely together that someone else's solution becomes incorporated into your answer, computer program or other submission. These general guidelines apply to any type of assignment and project.  You are expected to attend class regularly. I will take attendance on random days during the semester to ensure that the students are coming to class and if you miss class repeatedly, your grade will be affected. If you miss more than 80% of the class attendance you will not sit for final exams. Please try to be on time for class. I will not allow you enter if you are late for more than five minutes. | | | | |
| Textbook | |  | | | | |
| **Reference Materials** | | * A.D. Tathe.(2012). Lecture Notes on Climatology: For Intermediate Met Training Course, Indian Meteorological Department. * Addis Ababa University (2001). Introductory Geography of Ethiopia, Teaching Text, Department of Geography. * Assefa M., Melese W., Shimelis G.(2014). Nile River Basin; Ecohydrological Challenges, Climate Change and Hydropolitics. Springer International Publishing, Switzerland. * B. D, Ray (1989). Economics for Agriculture: Food, Farming and the Rural Economy. Macmillan. * CSA 1994 & 2007. Population and Housing Census Results. CSA: A.A. Diao, Xinshen,. 2007. The Role of Agriculture in Economic Development: Implications for Sub Saharan Africa. Sustainable Solutions for ending Hunger and Poverty, Research Report 153. IFPRI.Ethiopia. * Engdawork Assefa(2015). Characterization and classification of major agricultural soils in CASCEP intervention weredas in the central highlands of Oromia Region, Ethiopia, Addis Ababa University * FDRE.2001 Ministry of Water Resources, National Metrological Survey, A.A. Girma Kebede(2017). Society and Environment in Ethiopia * Hartshorne, T. & J. Alexander (1988). Economic Geography, 3rd Ed. Hooguelt, A (2001). Globalization and the post-colonial world. The New political Economy of Development. * Basingstoke plagrave. Hurni. H. 1988. Ecological Issues in the Creation of Ethiopia. Paper presented in the National Conference on Disaster prevention and preparedness Strategy for Ethiopia, A.A International Centre for Migration Policy Development (ICMPD) (2008). East Africa Migration Route Initiative Gaps & Needs Analysis Project Country Reports: Ethiopia, Kenya, Libya. * Vienna Laurence G., Jeremias M., Tilahun A., Kenneth M.(2012). Integrated Natural Resource Management in The Highlands of Eastern Africa; From Concept to Practice. New York, Earthscan. Lloyd, P. & P. Dickens (1977). Location in Space. Harper @ Row. Mesfin Woldemariam (1972). Introduction to Ethiopian Geography, Addis Ababa, Ministry of Agriculture/MOA/ (1998). Agro-ecological zones of Ethiopia: Natural Resources Management and Regulatory Department, Addis Ababa * Morgan R.P.C (2005). Soil Erosion and Conservation. National Soil Resources Institute, Carnfield University. Blackwell Publishing, Oxford, UK. OXFAM(2018). * Horn of Africa climate crisis response. Regional summary Pausewang, Siegfried (1990), Ethiopian Rural Development Options. Plant genetic resource center (1995). Ethiopia: country report to the FAO International Technical Conference on Plant Genetic Resource, Addis Ababa Robert, E.G, James, F.P & L. MichaelT.(2007). Essentials of Physical Geography. Thomson Higher Education, Belmont, 8th edition. * UNDP, FAO (1984) Ethiopia Forest Resources and Potential for Development; An assistance to land use planning. United Nations Framework Convention on Climate Change (2007). Climate * Change; Impacts Vulnerabilities and Adaptations in Developing Countries. http://www.preventionweb.net/publications/view/2759 Waugh, D. (1990). Geography: An Integrated Approach. Nelson: London | | | | |

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| **Course Code** | | PsyL 1011 | | | | |
| **Course Title:** | | **General Psychology and Life Skills** | | | | |
| **Degree Program** | | Information Systems | | | | |
| **Module Code** | | **01** | | | | |
| **Module Name** | | **Common course** | | | | |
| **ECTS Credits (CP)** | | 5 | | | | |
| **Contact Hours (per week)** | | **Lecture** | **Lab** | **Tutorial** | **Home Study** | **Total** |
| 2 | 0 | 3 | 5 | 10 |
| **Pre-requisites** | |  | | | | |
| **Mode of delivery** | | Semester wise | | | | |
| **Status of the Course** | | Compulsory | | | | |
| Course description | | This introductory course will provide students with an overview of the current body of knowledge and the science of psychology. This course examines the role of environmental factors and the interaction of nature and nurture in determining behaviors and mental processes. Areas to be discussed will include; the essence psychology, human development, theories of learning, memory and forgetting, motivation and emotion, psychological disorder and treatments. The course will also focus on how to develop life skills based on the theories and principles of psychology where self-development, academic and social skills shall be given due attention. | | | | |
| Course objective | | Upon completion of this course the students will be able to:   * Describe basic psychological concepts. * Compare and contrast the major theoretical perspectives in psychology. * Discuss different aspects of human development * Compare and contrast different learning theories * Summarize motivational and emotional processes * Demonstrate social and interpersonal skills in everyday life. * Set an adaptive goal and plan for future. * Apply knowledge of psychology to one’s own life & to develop life skills. * Explain ways how self-confidence, self-esteem, self-efficacy, assertiveness, responsible behaviors, interpersonal skills will be strengthened. * Apply different stress coping mechanisms. | | | | |
| **week** | | **Contents** | | | | |
| 1 | | Chapter One: Essence of Psychology  1.1. Definition of Basic Concepts  1.2. Goals of Psychology  1.3. Historical Background of Psychology  1.4. Theoretical Perspectives in Psychology  1.5. Branches of Psychology  1.6. Research Methods in Psychology  1.7. Applications of Psychology | | | | |
| 2&3 | | Chapter Two: Human Development  2.1.Definition and Concepts of Human Development  2.2. Facts and Principles of Human Development  2.3. Aspects of Human Development  2.4. Theories of Human Development  2.4.1. Cognitive Theories  2.4.2. Psychosexual Theory  2.4.3. Psychosocial Theory  2.4.4. Moral Development Theory  2.5. Personality Development  2.5.1. Meaning of Personality  2.5.2. Trait theories of Personality  2.5.3. Humanistic theories of Personality | | | | |
| 4 &5 | | Chapter Three: Learning and Theories of Learning  3.1 Definition, Principles and Characteristics of Learning  3.2 Factors Influencing Learning  3.3 Theories of Learning and their Applications  3.3.1. Behavioral Theory of Learning  3.3.2. Social Learning Theory  3.3.3. Cognitive Learning Theory | | | | |
| 6 | | Chapter Four: Memory and Forgetting  4.1. Memory  4.1.1. Meaning and Process Of Memory  4.1.2. Stages of Memory  4.1.3. Factors Affecting Memory  4.2. Forgetting  4.2.1. Meaning and Concepts of Forgetting  4.2.2.Theories of Forgetting  4.3. Improving Memory | | | | |
| 7&8 | | Chapter Five: Motivation and Emotion  5.1. Motivation  5.1.1. Definition and Types of Motivation  5.1.2. Theories of Motivation and their Applications  5.1.3. Conflict of Motives and Frustration  5.2. Emotion  5.2.1. Definition of Emotion  5.2.2. Components of Emotion  5.2.3. Theories of Emotion and their Applications | | | | |
| 9 | | Chapter Six: Psychological Disorders and Treatment Techniques  6.1. Nature of Psychological Disorders  6.2. Causes of Psychological Disorders  6.3. Types of Psychological Disorders  6.4. Treatment Techniques | | | | |
| 10 | | Chapter Seven: Introduction to Life Skills  7.1. Nature and Definition of Life skills  7.2. Goals of Life Skills  7.3. Components of Life Skills | | | | |
| 10-12 | | Chapter Eight: Intra-personal and Personal Skills  8.1. Self-Concept and Self-Awareness  8.2. Self-Esteem and Self-Confidence  8.3. Self-Control  8.4. Emotional Intelligence and Managing Emotion  8.5. Resilience and Coping with Stress  8.6. Anger Management  8.7. Critical and Creative Thinking  8.8. Problem Solving and Decision Making | | | | |
| 13 | | Chapter Nine: Academic Skills  9.1. Time Management  9.2. Note-taking and Study Skills  9.3. Test-Taking Skill  9.4. Test Anxiety and Overcoming Test Anxiety  9.5. Goal Setting  9.6. Career Development Skill | | | | |
| 14-15 | | Chapter Ten: Social Skills  10.1. Understanding Intercultural Diversity and Diversity Management  10.2. Gender and Social Inclusion  10.3. Interpersonal Communication Skills  10.4. Social Influences and Peer Pressure  10.5. Assertiveness  10.6. Conflict and Conflict Resolution  10.6. Team Work  10.7. Overcoming Risky Behavior | | | | |
| Teaching methodology | | * Gapped Lecturing * Brainstorming * Collaborative learning * Discussion Independent learning Reading assignment and presentation * Role play | | | | |
| Assessment Criteria | | Quiz ….12%  Individual Assignment …….11%  Group Assignment……12%  Mid exam…………….25%  Final Exam…………..40% | | | | |
| Attendance | | Lecture: 85% | | | | |
| **Course Policy:** | | All students are expected to abide by the code of conduct of students (article 166 and 166.1.1, of The Senate Legislation of University Name May 20, 2005) throughout this course. Academic dishonest including cheating, fabrication, and plagiarism will not be tolerated at any stage during your studies and will be reported to concerned bodies for action. If you need it, you can get a copy (to be copied by yourself) of it from your academic advisor.  It is expected that all work handed in by a student will be original work that has been done by the individual. If it is not, then this act of intellectual dishonesty will be dealt with severely.  While students are expected to work reasonably independently, I do not expect you to work in isolation. Often you learn best when working with others on an assignment. So what degree of collaboration is expected and, indeed, encouraged, and what is deemed to be cheating? If you are having problems with the assignments or tests, contact the instructor as soon as possible. It will NOT be possible to earn extra credit to improve a poor grade at the end of the semester.  In general, we encourage things like bouncing ideas off one another, discussing which of two alternate solutions might be better (and why), and getting another's ideas on how to resolve a difficulty that you have already spent time on. However, you should not be working so closely together that someone else's solution becomes incorporated into your answer, computer program or other submission. These general guidelines apply to any type of assignment and project.  You are expected to attend class regularly. I will take attendance on random days during the semester to ensure that the students are coming to class and if you miss class repeatedly, your grade will be affected. If you miss more than 80% of the class attendance you will not sit for final exams. Please try to be on time for class. I will not allow you enter if you are late for more than five minutes. | | | | |
| Textbook | |  | | | | |
| **Reference Materials** | | * Coon, D. & Mitterer, J.O. (2008). Introduction to psychology: Gateways to mind and behavior (12th ed). New York, NY: McGraw Hill. * Feldman, R.S. (2018). Essentials of understanding psychology (13th ed). New York, NY: McGraw Hill. * Gray, P. & Bjorklund, D.F. (2017). Psychology (7th ed). New York, NY: Worth Publishers. * Kalat, J.W. (2013). Introduction to psychology (13th ed). New York, NY: McGraw Hill. * Lahey, B.B. (2008). Psychology: An introduction (10th ed). New York, NY: McGrawHill. * Lilienfeld, S.O., Lynn, S.J., Namy, L.L. & Woolf, N.J. (2017). Psychology: From Inquiry to understanding (3rd ed). Upper Saddle River, NJ: Pearson Education. * Meyers, D.G. & DeWall, C.N. (2016). Exploring psychology in modules (10th ed). New York, NY: Worth publishers. * Weiten, W. (2014). Psychology: Themes and variations (briefer version, 9th ed). Belmont, CA: Wadsworth Publishing. * Burnard, P. (1989). Teaching interpersonal skills: A handbook of experiential learning for health professionals. London, UK: Chapman and Hall. * Cotnell, S. (2013). The study skills handbook. New York, NY: Palgrave MacMillan. * Haddon, P.F. (1990). Mastering personal and interpersonal skills: Key techniques and personal success. London, UK: Thorogood Ltd. * Hays, J. (2002). Interpersonal skills at work (2nd ed). New York, NY: Routledge. * Pavord, E. & Donnely, E. (2015). Communication and interpersonal skills (2nd ed). Banbury, UK: Lantern publishing. | | | | |

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| **University Name**  **---------------------**  **Information Technology Program** | | | | | |
| **Program** | Information Technology | | | | |
| **Course Code** | Math1014 | | | | |
| **Course Title:** | Applied Mathematics | | | | |
| **Degree Program** | **Information System** | | | | |
| **Module Name** | Common course | | | | |
| **Module Number** | **01** | | | | |
| **CP Credits (CP)** | 5 | | | | |
| **Contact Hours (per week)** | ***Lecture*** | ***Tutorial*** | ***Lab/Practical*** | ***Home Study*** | ***Total*** |
| 3 | 3 | 0 | 4 | 10 |
| **Target Group:** | 1st year | | | | |
| **Year /Semester** |  | | | | |
| **Pre-requisites** | None | | | | |
| **Status of the Course** | General/Supportive | | | | |
| **Course Description** | This course contains the following contents: Vectors, Matrices, Determinants and system of Linear equations, Derivative and its applications, some transcendental functions with inverses, Integration and its applications. | | | | |
| **Course Objectives** | **At the end of this course students should be able to**:   * Understand the concept of vectors and matrices. * Find the equation of lines and planes in space. * Find the distance between two lines (two planes). * Solve system of linear equations by using an appropriate method. * Determine eigenvalues and eigenvectors of a matrix. * Appreciate the applications of eigenvalues and eigenvectors in real problems. * Interpret physical and Geometrical meaning of derivative of function at a given point. * Find the global or relative extreme values of a function. * Sketch the graph of a function. * Evaluate the limits of functions by using L’Hopital’s Rule. * Find the derivative of a function defined implicitly. * Evaluate the integral of a function by using an appropriate method. * Evaluate the improper integral. * Find the volume of solid region generated by revolving a plane region about a certain suitable axes. * Find the arc length of a curve determined by a function * Find the surface area of solid region. | | | | |
| **Course contents** | **Chapter 1: Vectors**   * 1. Definition   2. Operations on vectors   3. Cartesian Coordinates in space   4. Vector in space   5. Norm of a vector   6. Scalar and Cross product   7. Equations of lines and planes in space   **Chapter 2:Matrices and Determinants**  2.1 Definition  2.2 Matrix operations and their       properties  2.3 Elementary row  operations and        Echelon forms  2.4 Rank of a Matrix  2.5 Inverse of a Matrix  2.6 Determinant of a square matrix  2.7 Inverse using determinant  2.8 System of linear equations      (Gauss Jordan method and      Cramer’s rule)  2.9 Eigenvalues and eigenvectors  **Chapter 3: Derivatives and its applications**  3.1 Definition  3.2 Differentiable function  3.3 Derivatives of differentiable       function  3.4 Derivatives of combination of       Functions  3.5 Chain rule  3.6 Higher derivatives  3.7 Implicit differentiation  3.8 Applications of derivatives  3.8.1 Max.&Min.value  3.8.2 Mean value theorem & its          application  3.8.3 Derivative test (1st& 2nd tests)  3.8.4 Extreme values  3.8.5 Concavity and inflection pts  3.8.6 L’Hopital’s rule  **Chapter 4:SomeTranscendental  unctions with inverses**  4.1 Definition of inverse of a       function &their properties  4.2 Derivative of inverse function  4.3 Trigonometric  functions  4.4 Hyperbolic functions  **Chapter 5: Integrals**  5.1 The indefinite integral and        integration rules  5.2 Techniques of integration  5.2.1 Integration by substitution  5.2.2 Integration by parts  5.2.3 Integration by partial fraction  5.2.4 Integration by Trigonometric          substitution  5.3 Trigonometric integrals  5.4 Definite integral and its       properties  5.5 Fundamental theorem of        Calculus  5.6 Improper integrals  5.7 Applications of integrals  5.7.1 Volume  5.7.2 Arc length  5.7.3 surface Area | | | | |
|  |
| Assessment | As per University Legislative | | | | |
| Reference | **Text**: R.Ellis and D.Gulick: Calculus with Analytic Geometry 5th edition  **Reference Materials**:   1. Leslie Hogben: Elementary Linear Algebra 2. Howard Anton: Elementary Linear Algebra 3. Howard Anton: Calculus with Analytic Geometry 5th edition | | | | |