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| **Course Code** | CS211 Credit Hours **5** |
| **Course Title** | ICT Fundamentals / Fundamentals of Software Engineering |
| **Programme** | BSc. In Computer Science / BSc. in Software Engineering |
| **Course Description** | This course introduces the concept of ICT and its applications in the wide range of everyday life and our work environment. It addresses concepts related to the components of a computer system, data representation and encoding, computer networking and data transmission, introductory software engineering concepts, computer system architecture, and future trends in ICT.  The aim of this course is to introduce you to the basics of ICT and help you develop a culture of learning current technology trends so that you are able to harness the potentials of Information and Communications Technology.  This course is intended for students with little or no background in computer and communication technologies. |
| **Objectives** | Upon successful completion of this course students are expected to:   * Define Information, and Information Communications Technology * Understand the concept of a system and how it relates to information systems. * Understand the unification of computer & communication technologies * Understand computer program execution steps and organization of the CPU * Identify the basic components of the system unit and the way they interact to form a single computing system * Identify and describe different types of computer software * Understand data representation techniques and computer arithmetic * Understand computer-based communications and networking concepts * Know the processes and considerations of Business Process Engineering * Appreciate the concepts surrounding the Internet, e-commerce / e-business activities, and the World Wide Web * Understand the enabling/pervasive features of ICT * Identify major trends in ICT |
| **Textbook** |  |
| **References** | * Introduction to Information Systems. O’Brien & Marakas, Fifteenth Edition * Computer Science an overview, 11th edition by J. Glenn Brookshear * Using Information Technology; Williams, Sawyer, Hutchinson * A Balanced Introduction to Computer Science by David Reed, 3rd Edition * Introduction to Computers, Peter Norton * Computers and information systems, Hutchinson/sawyer * Introduction to computers and information Systems. Donald a. Morris * Fundamentals of Information Technology. ALAGAPPA University Karaikudi, Directorate of Distance Education * Vickery, Brain and Alina Vickery. Information science in theory and practice. Bowker-Saur, 1987 * Modern systems Analysis. Jeffery A. Hoffer * Perrole, Judith, Computers and Social Change: Information, Property, and power (web Edition), 1997 |
| **Assessment Method** | |  |  | | --- | --- | | * Assignments: 10% | * Mid. Exam: 20% | | * Lab: 20% | * Final Exam: 50% | |
| **Term - Year** | * Autumn 2020 |
| **Instructor** | Abdella E. Mohammed [abedris@yahoo.com](mailto:abedris@yahoo.com) www.github.com/abedris |

**COURSE CONTENT**

1. Introduction
   1. Overview of ICT and CS
   2. Knowledge Hierarchy (and Knowledge Management\*)
   3. Components of Information Systems
   4. Applications of ICT/IS/Computers
   5. Information Systems in Business
2. The Development of Computer Hardware and Software
   1. Evolution of Computers
   2. Computer Generations
   3. Milestones in Computer HW & SW Development
   4. Types and Characteristics of Computers\*
   5. Components of the Computer System
   6. Software Generations
   7. System Software and Application Software\*
3. Data Representation and Computer Arithmetic
   1. Number Systems and Conversion
   2. Binary Arithmetic And Complements
   3. Fixed and Floating Point Numbers
   4. Units of Data Representation and Coding Methods
   5. Boolean Algebra and Logic Circuits\*
4. Computer Organization and Architecture
   1. Microcomputer Architecture
   2. Computer Program execution and the CPU organization
   3. Hierarchical (Layered) Organization of the Computer System
   4. Functions and components of the Operating System\*
   5. Programming Languages and Programming Paradigms\*
5. Business Process Engineering
   1. Steps in Software Systems Development
   2. Phases of SDLC
   3. SDLC Models
6. Data Communications and Computer Networks
   1. Data Transmission Concepts
   2. Data Transmission Software
   3. Data Communication Channels and Technologies
   4. Types of Computer Networks
   5. Network Topologies
   6. Networking Components (Devices, Software, …)
7. Internet, Intranet and Extranet
   1. History
   2. How it works
   3. Electronic Communication tools (e-services)
   4. Services (www, Telnet, email, ftp, IRC, internet telephony, …)
   5. Cloud Computing\*
8. Future Trends in ICT **[Reading Assignment]**
   1. Artificial Intelligence
   2. Ubiquitous (Pervasive) Computing
   3. Grid Computing
   4. Internet of Things