



## COURSE DESCRIPTION FOR THE COMPUTER INFORMATION SYSTEMS CURRICULUM

<b>Course Code</b>	<b>2505100</b>
<b>Course Name</b>	<b>Computing Fundamentals</b>
<b>Credit Hours</b>	<b>Pass/ Fail</b>
<b>Prerequisite</b>	<b>None</b>

This course includes an introduction to the use of the computer for those students in areas where the computer is a useful tool. Covers general problem solving, Computer hardware and software, data handling, binary system. Covers operating systems (windows), MS-Office and internet (searching and Email)

**Lab Session:** Electronic Spreadsheet, Basics of Ms-Office components. Internet surfing, e-mail managers.

<b>Course Code</b>	<b>2505221</b>
<b>Course Name</b>	<b>Fundamentals of Computer Programming</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505100</b>

This course introduces problem solving top – down algorithmic development, the fundamental concepts of procedural programming, program development using a procedural programming like C++ programming language topics include data types, control structures, functions, arrays, String manipulation, pointers and structures, file processing, and the mechanics of running, testing, and debugging. Programming implementation should be taken in the Computer Labs.

**Lab Session:** Programming assignments to exercise the use of various features of the programming language taught in the course.

<b>Course Code</b>	<b>2505222</b>
<b>Course Name</b>	<b>Discrete Mathematics</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 1 tutorial)</b>
<b>Prerequisite</b>	<b>2505100</b>

This course examines the propositional logic, logical connectives, truth tables, normal forms (conjunctive and disjunctive), validity, predicate logic, universal and existential quantification, Modus ponens and modus tollens, Limitations of predicate logic, Functions (surjection, injection, inverse, composition); Relations (reflexivity, symmetry, transitivity, equivalence relations), Sets (Venn diagrams, complements, cartesian products, power sets), pigeonhole principle, cardinality and counting, the structure of formal proofs, direct proofs, proof by counterexample, Proof by contraposition, proof by contradiction, mathematical induction, strong induction, Recursive mathematical definitions, basics of counting, graphs and trees, discrete probabilities.

<b>Course Code</b>	<b>2505223</b>
<b>Course Name</b>	<b>Computer Information System</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures)</b>
<b>Prerequisite</b>	<b>2505100</b>

This course covers conceptual foundations of information systems, information requirements for decision making and problem solving, types of information systems (TPS, MIS, DSS, GIs, ES, IRS, ...etc.), information systems hardware and software, systems development (analysis, design, and implementation), data management and database development, acquiring and managing information systems, quality and performance considerations, ethical, societal and global issues.

<b>Course Code</b>	<b>2505224</b>
<b>Course Name</b>	<b>Information Technology Infrastructure</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures)</b>
<b>Prerequisite</b>	<b>2505100</b>

Information technology strategies, infrastructure planning, technology standards and organizations, basic components of an IT infrastructure (architecture, resources, budgeting, strategic and capacity planning, organizational structure, security measures, metrics, vendor relations, etc.), global information infrastructures and the globalization of IT infrastructures (local vs. regional and global), IT service management, legal aspects of managing IT infrastructures, IT transfer problems, future trends.

<b>Course Code</b>	<b>2505225</b>
<b>Course Name</b>	<b>Data Structures &amp; Algorithms</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505221</b>

This course focuses on topics that help students to structure and store data in an efficient way. Logical and physical data representation, algorithms, complexity and efficiency, data structure operations, dense lists, and matrix representations, linked lists and their different variations, string storage representation and manipulation, queues and stacks and their applications, tree structures and their different variations, graphs and networks, sorting techniques, searching techniques. Students should also program what they learned by using a high-level programming language in order to enhance their understanding of the main data structures concepts including stacks, queues, linked list, trees, graphs etc.

**Lab Session:** Programming assignments of applications that use the data structures studied in class. The use of abstract data types concept in programming is stressed. Implementation of well known algorithms.

<b>Course Code</b>	<b>2505231</b>
<b>Course Name</b>	<b>Security and Privacy of Information</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures)</b>
<b>Prerequisite</b>	<b>2505224</b>

This course includes ethical uses of information and information systems, privacy considerations, policies and standards, security measures (protection, detection and reaction, attacks and threats, intrusion prevention, encryption and credentials identification and authentication, hacking security, access controls, identity management, etc.), security tricks and the human factor, data recovery, security risk analysis and assessment, security management. Viruses and anti-viruses programs

<b>Course Code</b>	<b>2505232</b>
<b>Course Name</b>	<b>Principles of Object-Oriented Programming</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505221</b>

This course introduces design concepts of Object-oriented, programming principles, features ,foundations of the model, classes and objects, relationships among classes, relationships among objects, interplay of classes and objects, approaches to identifying classes and objects, object-oriented design methodologies, methodology notation (elements of UML or any other selected notation, class and object diagrams, interaction diagrams, state transition diagrams, process and module diagrams, etc. ), the object-oriented software development process (analysis, design and implementation), code reusability, management issues. Student practice OOP in the software development life cycle by using Java or **C++**.

**Lab Session:** Using an Object oriented programming language for project realization.

<b>Course Code</b>	<b>2505233</b>
<b>Course Name</b>	<b>Human-Computer Interaction</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505225</b>

This course covers historical development, task-centered and user-centered design. Functionality and usability. Communication human-human, human-machine. Ergonomics, cognitive ergonomics. Software/interface guidelines. Psychology memory, short and long-term; closure; control, choice reaction time experiments, perception; learning, experimental method. Engineering: bandwidth; channel capacity; information quantification. Physiology: human sense modalities. Classification of styles, their characteristics and application. Command language, menus, form-filling, direct manipulation etc. Natural language. Adaptive/non-adaptive interfaces. Hardware (keyboards, pointing devices, screens. speech synthesis, speech recognition). Interface specification and design. Implementation Issues. Interface evaluation

**Lab Session:** Designing interface according to the theoretical specifications.

<b>Course Code</b>	<b>2505311</b>
<b>Course Name</b>	<b>System Analysis &amp; Design</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures)</b>
<b>Prerequisite</b>	<b>2505223</b>

This course includes the foundations of system development tools, cost benefit analysis, prototyping, alternate system design strategies, human interface designing, application development and CASE tools. The course also includes systems development lifecycle: systems planning and selection, system analysis, system design, system implementation and operation.

<b>Course Code</b>	<b>2505312</b>
<b>Course Name</b>	<b>Computer Organization and Architecture</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505100</b>

This course focuses on fixed- and floating-point systems, signed and twos-complement representations, representation of nonnumeric data (character codes, graphical data), Basic organization of the Von Neumann machine, control unit; instruction fetch, decode, and execution, Instruction sets and types (data manipulation, control, I/O), assembly / machine language programming, Instruction formats, Addressing modes, Subroutine call and return mechanisms, I/O and interrupts, memory hierarchy, main memory organization and operations, Latency, cycle time, bandwidth, and interleaving, Cache memories (address mapping, block size, replacement

and store policy), virtual memory (page table, TLB), I/O fundamentals, control unit: hardwired realization vs. micro-programmed realization, Instruction pipelining, multiprocessing and alternative architectures.

**Lab Session:** Assembly language programming

<b>Course Code</b>	<b>2505313</b>
<b>Course Name</b>	<b>Electronic Commerce</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505223</b>

The target of this course is to let students understand the electronic conduction of the commercial activities. Explore the use of information technologies and concepts, key features of E-commerce and methodologies, electronic fund transfer, Internet and the world wide web, main applications of e-business and e-commerce, process of implementing ecommerce in organizations, infrastructure and architecture of ecommerce systems, development environments and methods for e-commerce, security of business transactions on the Internet.

**Lab Session:** Hands-on experience in developing an e-commerce Application

<b>Course Code</b>	<b>2505314</b>
<b>Course Name</b>	<b>Multimedia Systems</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505223</b>

This course includes multimedia concepts and terminology, interactive multimedia technology, multimedia data types and formats (graphics, images, animation, audio, video, etc.), integrated multimedia authoring techniques, techniques for designing and producing multimedia applications using multimedia-authoring tools, industry standards, future directions in interactive multimedia technology, design and implementation considerations of multimedia systems, storage issues of multimedia systems.

**Lab Session:** Hands on developing multimedia applications by integrating different authoring techniques.

<b>Course Code</b>	<b>2505321</b>
<b>Course Name</b>	<b>Fundamentals of Database System</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505223</b>

This course introduces the concepts and techniques of database systems, Information models and systems (relational databases, hierarchical, network, temporal, etc), relational database design, data modeling, normalization, data definition languages, data manipulation languages, database query languages, transaction processing, physical database design, storage and file structure; indexed files; hashed files; signature files; b-trees; files with dense index; files with variable length records; database efficiency and tuning, data integrity, security, backup and recovery. This course will also cover briefly the concepts of object-oriented database, expert database and distributed databases.

**Lab Session:** Developing simple application using a data base package.

<b>Course Code</b>	<b>2505322</b>
<b>Course Name</b>	<b>Information Networks</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505312</b>

This course provides basic concepts of computer networks, the network model components, network operating system, local area networks, design and Implementation Issues of computer networks, responsibilities of a network administrator, using network operating system (designing the user community, permissions and rights, groups and domains, adding workstations), sharing of Information across the network. fundamentals of LANs, MANS and WANs, LAN topologies and types, WAN technologies (circuit switching, packet switching, ATM, ISDN, DSL, etc), performance issues, networking protocols (OSI, TCPIIP), multiple-access and flow control, error correction and detection, emphasis on lower four layers of IS0 reference model.

**Lab Session:** Network management, protocols programming, network simulation using packages and use of network analysis tools.

<b>Course Code</b>	<b>2505411</b>
<b>Course Name</b>	<b>Web Development and Programming</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505225</b>

This course reviews the Internet programming concepts, web servers, design methodologies, client-side & server-side programming, web applications in the software development life cycle, web development basic concepts, develop dynamic web pages, web development languages, JSP and servlets to coldfusion code, flash emoting. Develop web applications by integrating different web technologies, using HTML, SML, XML, CFMX, flash. Monitoring system performance, Working with XML, Manipulating XML with XSLT and XPath, Using WDDX, Using Server-Side HTTP and FTP. Programming common gateway Interfaces, programming User Interface for the web applications.

**Lab Session:** Hands on Developing web applications by integrating different web technologies.

<b>Course Code</b>	<b>2505412</b>
<b>Course Name</b>	<b>Intelligent Information Systems</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505225</b>

This course includes modeling cognitive processes using the Artificial Intelligence (AI) approach includes heuristic methods, knowledge representation, inference engines, forward and backward reasoning, intelligent information systems and learning, planning of actions, programming for Intelligent information systems, applications and case studies. The course also includes programming in one of the artificial intelligence languages like Prolog, LISP, etc.

**Lab Session:** Use of artificial intelligence language to implement known cases.

<b>Course Code</b>	<b>2505413</b>
<b>Course Name</b>	<b>Computer Operating Systems</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505312</b>

This course focuses on operating system structure and services, processor scheduling, concurrent processes, synchronization techniques, deadlocks, memory management, virtual memory, cache memory, input/output, secondary storage management, and file systems.

**Lab Session:** Use of Unix and Windows NT as examples of general purpose operating systems for Laboratory assignments.

<b>Course Code</b>	<b>2505431</b>
<b>Course Name</b>	<b>Advanced Database Systems</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505321</b>

This course introduces students to advanced topics in database systems such as transaction management, concurrency control, security; optimization, Object-Oriented Databases, distributed databases, specialized topics such as data warehousing/mining, current developments in database technology, and the integration of databases to the Internet-worked environment will also be explored.

**Lab Session:** Implementing advanced database applications.

<b>Course Code</b>	<b>2505432</b>
<b>Course Name</b>	<b>Distributed Systems Applications</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures)</b>
<b>Prerequisite</b>	<b>2505321</b>

This course provides basic concepts of distributed systems, design and Implementation issues of Distributed Applications, enterprise client-server architectures, distributed objects architecture, Object Request Brokers (ORB), software performance engineering, design principles and techniques of distributed applications (workload, efficiency, locality, sharing, data base, parallelism), distributed applications types (Middleware and performance, architecture and design for high performance), performance tools, DBMS Technology, transaction managers and transaction monitors.

<b>Course Code</b>	<b>2505498</b>
<b>Course Name</b>	<b>Special Topic in Computer Information Systems</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 2 labs)</b>
<b>Prerequisite</b>	<b>2505225</b>

This course gives the students an opportunity to have an exposure to the state of the art in advanced computer information systems topics.

**Lab Session:** projects are used to practice the concepts and techniques described in the course

<b>Course Code</b>	<b>2505499</b>
<b>Course Name</b>	<b>Senior Project</b>
<b>Credit Hours</b>	<b>3 credit hours (3 lectures + 3 labs)</b>
<b>Prerequisite</b>	<b>2505321</b>

This is a capstone course that will provide students the opportunity to incorporate the conceptual knowledge and the practical skills in computer information systems that they have learned throughout the course of study and apply them in a project. Such project would give the students the chance to experiment the whole life cycle of information system phases of development as well as experimenting effectively different roles of project management team. It aims at providing the students an increasing range of diverse technical skills, including those for systems analysis, design, development, implementation, testing and maintenance. This course emphasizes teamwork on a substantial project.