



**FCIT**  
K A U

# COURSE CATALOG

IT Bachelor Program



Computing  
Accreditation  
Commission

## IT Courses

### CPIT-100 Computer Skills (3 Credits)

The course introduces the students to the main concepts and terminologies of information technology, and equips them with the knowledge to administer one of the widely-used operating systems. Topics include Computer Skills Introduction to information Technology, Operating Systems (Microsoft Windows), Word Processing (Microsoft Word), Data Sheets (Microsoft Excel), Databases (Microsoft Access), Presentations (Microsoft Power Point), Internet (Microsoft IE), E-Mails (Microsoft Outlook), E-Learning and Distance Learning.

### CPIT-201 Introduction to Computing (3 Credits)

The objective of this course is to present computer science subject areas and applications in ways that serve to motivate the study of computer science and to put into context the various subjects that students encounter later in their studies. Topics include an introduction to the discipline of computing, computer systems, number systems, data representation, basic computer organization, operating system functionality, basics of networking, the Internet, an overview of database systems, models, software engineering methodologies, and programming languages.

### CPIT-210 Computer Architecture (3 Credits)

The objective of this course is to provide an introduction to basic computer organization. Topics include binary, hexadecimal, and decimal number conversions, binary number arithmetic, laws of Boolean algebra, basic computer logic, gates, combinational circuits, sequential circuits, adders, counters, registers, decoder, encoder, comparator, multiplexer, computer organization buses and computer architecture, cache memory, computer arithmetic, instruction sets, and addressing modes.

*PREREQ: CPCS-202*

### CPIT-220 Introduction to IT (3 Credits)

The objective of this course is to provide an overview and understanding of the conceptual base of Information Technology, introducing the newly specialized IT students with the knowledge and skills related to understanding existing and emerging information technologies. Students will find this a helpful Bridge course to upper level courses in Information Technology. This course is supported with a laboratory that aims to equip students with practical knowledge and presentation skills. The purpose of this course is threefold: (1) to provide comprehensive and engaging overview of cutting edge information technologies, (2) to identify and discuss fundamental principles underlying these technologies, and (3) to relate these technologies to practical life. Topics include an introduction to information technology, digital and analog signals, inside the system unit, system software, databases and information systems, system analysis and design, information systems and databases, networking, privacy, crime and security.

*PREREQ: CPIT-201*

### CPIT-221 Technical Writing (2 Credits)

The objective of this course is to study the fundamentals of technical communication. Topics include the concepts of technical communication and its differences with academic writing, processes in technical communication, tools and techniques to perform collaborative projects and writing, formatting the technical documents with modern tools and techniques, techniques to write official letters, memos and e-mails, writing definitions and descriptions, writing informal reports to address immediate and intermediate tasks accomplishment, writing formal reports to portray the complex nature of issues, writing informal proposals to cover projects with limited scope, writing formal proposals to submit a detailed document, normally applied to large projects, developing presentation skills, preparing effective CV's and cover letters, developing skills for job interviews, learning styles in technical writing for effective revision, and practicing professional presentations in a seminar environment.

### **CPIT-240 Databases (I) (3 Credits)**

This course is the first in a series of courses on designing and implementing database information systems. The objective of this course is to prepare students to become able to implement a working database system using one of the popular commercial DBMSs. Topics include data and information, file system, database and database users, database system concepts and architecture, data modeling using the entity relationship (ER) model, the relational data model and relational database constraints, functional dependencies and normalization for relational databases, relational algebra and relational calculus, relational database design by ER and EER to relational mapping, disk storage, basic file structure and hashing, SQL-99 schema definition, constraints, queries, and views.

*PREREQ: CPCS-204*

### **CPIT-250 System Analysis and Design (3 Credits)**

The objective of this course is to provide a methodical approach to developing computer systems, including systems planning, analysis, design, and implementation. The course approaches the development of information systems from a problem-solving perspective, placing emphasis on the strategies and techniques of systems analysis and design for producing logical methodologies for dealing with complexity in the development of information systems.

*PREREQ: CPCS-204*

### **CPIT-251 Software Engineering (I) (3 Credits)**

The objective of this course is to study software engineering principles and techniques used in the specification, design, and testing of software systems. Major software development methodologies are reviewed including requirements, analysis and specification, design, testing, and documentation.

*PREREQ: CPIT-250*

### **CPIT-252 Software Design Patterns (3 Credits)**

The objective of this course is to study the principles behind the patterns of software and to then apply a number of basic patterns. This course covers fundamental aspects of large scale software architecture, defined frameworks, design patterns,

and ways of developing and establishing systems based on components. The purpose of this course is: (1) to know the classical styles of software pattern and the need for a language to describe the architecture, (2) to understand how to express the qualities we want our architecture to provide to the system or systems we are building from it, and (3) to know how to achieve software qualities using TACTICS. Topics include envisioning architecture (architecture business cycle), architectural patterns, reference models, reference architectures, understanding quality attributes, achieving qualities using tactics, and how to document software architecture.

*PREREQ: CPIT-251*

### **CPIT-260 Operating Systems (3 Credits)**

The objective of this course is to provide an introduction to the basic concepts of modern operating systems. The course covers the design of operating systems and the way they work, in terms of efficiency and reliability, in addition to comparing between the techniques used inside the operating systems, in terms of time and space complexity. Topics include the basic components of different operating systems, organizing and managing processes, computing synchronization, different scheduling techniques for processors, storage devices, memory management, file systems, and input/output systems.

*PREREQ: CPCS-204, CPIT-210*

### **CPIT-280 Human-Computer Interaction (3 Credits)**

The objective of this course is to study the fundamentals and principles of human computer interaction. Also, it is intended to develop the student's ability to explore and implement a usable design, in addition to measure, analyze, and evaluate the human computer interaction systems

*PREREQ: CPIT-250*

### **CPIT-285 Computer Graphics (3 Credits)**

The objective of this course is to study the hardware and software principles of interactive raster graphics. Topics include an introduction to the basic concepts of computer graphics, vector and pixel displaying system, basic computer graphics techniques, graphical software, the use of

API(s) for computer graphics, color models, coordinates homogeneous, transformation, rotation, clipping, representation of objects through polygons, two-dimensional and three-dimensional computer graphics techniques, coordinate transformations, drawing curves and surfaces, shading and lighting models, graphics devices, animation techniques, ray tracing, and the design and drawing of two-dimensional and three-dimensional graphics objects in OpenGL in C++.

*PREREQ: CPCS-204*

### **CPIT-305 Advanced Programming (3 Credits)**

The objective of this course is to study advanced techniques in Java programming. Topics include how to build applications for different purposes, methods for Java programs to interact with other existing technologies, exception and error handling, streams and files operations, concurrent programming, network and socket programming, and Java Database Connectivity (JDBC).

*PREREQ: CPCS-204*

### **CPIT-323 Summer (workplace) Training (0 Credit)**

This is mandatory, 200-hour internship program for all students in FCIT. The objective of this course is to provide students the opportunity to apply their academic education with hands-on, real world experience in a work setting. Students are sent to different companies to get the real flavor of work group, communications, and professional development experiences.

### **CPIT-330 IT Issues and Management (3 Credits)**

The objective of this course is to study the concepts and application of Agile and Scrum techniques to manage software development projects. Topics include an introduction to agile project management, fundamentals of Scrum for dealing with uncertainty and risk, identifying the roles and their responsibilities, managing releases, tools for tracking and monitoring a project, planning an agile project, establishing the business reasons for the project, clarifying the business vision, identifying features for development in an iteration, fostering self-management within the development team, creating the optimal working environment, transitioning to self-management, running iterations, managing change, reviewing the iteration through a sprint review, closing the

project using a sprint retrospective, applying agile throughout your organization, dealing with the legacy organization, and scaling for large projects.

*PREREQ: CPIT-220, CPIT-250*

### **CPIT-340 Database (II) (3 Credits)**

The objective of this course is to study advanced topics in the domain of databases. Topics include distributed databases and client-server architectures, concepts for object databases, enhanced data models for advanced applications, database tuning in relational database systems, concurrency control techniques, and database security.

*PREREQ: CPIT-240*

### **CPIT-345 Database Administration (3 Credits)**

The objective of this course is to explore a variety of topics in Database Administration. Using hands-on training, students will learn about installation, configuration, administration, performance, security, backup and recovery, and enterprise services of databases. Additional topics include an introduction to DBMS, schemas objects, partitioned tables and indexes, built in data types, backup and recovery, enterprise tools, services and connectivity, locking, and concurrency.

*PREREQ: CPIT-240*

### **CPIT-370 Computer Networks (3 Credits)**

The objective of this course is to provide a wide background of computer networks, giving students the basic knowledge of data communication, medium accessing protocols, local area networks, and an overview of the higher level protocols. Topics include principles of computer networks, network standard models, analog and digital signals, multiplexing schemes, transmission media, multiple access techniques, wired and wireless lans, network devices, IP addressing, domain name system, and laboratory experiments.

*PREREQ: CPIT-201*

### **CPIT-375 Data Network Design and Evaluation (3 Credits)**

The objective of this course is to study the concepts and practical skills to design and evaluate

data networks. Topics include technical concepts related to the data networks design, managerial aspects of the design, and technical skills needed to evaluate different network technologies, thereby enabling students to compare and contrast different alternatives for network designs.

*PREREQ: CPIT-370*

### **CPIT-380 Multimedia Technologies (3 Credits)**

The objective of this course is to study multimedia technologies and programming methods to manipulate multimedia. Topics include creating and modifying images, modifying sounds, splicing words into sentences, reversing sounds, writing programs to generate dynamic web-pages from databases, and creating animations and movies with special effects.

*PREREQ: CPIT-285*

### **CPIT-405 Internet Applications (3 Credits)**

The objective of this course is to study internet programming and web-application development. Students will learn basic principles and techniques for building internet applications. It provides students with the basic web-page development technologies and an introduction to dynamic web-page development using client-side scripting. Topics include introduction to HTTP protocol and client side programming, XHTML, Cascading Style Sheets, JavaScript DOM, XML (Name space, DTD, Schema, XSLT, XPATH), RSS, and AJAX.

*PREREQ: CPIT-252, CPIT-370*

### **CPIT-425 Information Security (3 Credits)**

The objective of this course is to provide basic knowledge on the technical and operational issues of modern cryptosystems and the related standards. Topics include threats to network security and schemes for breaking security, classical encryption techniques, block ciphers and stream ciphers, DES and triple DES, AES, block cipher operation modes, asymmetric ciphers: RSA, Diffie-Hellman key exchange, ElGamal cryptosystem, hash functions, MAC functions, digital signature, key management and distribution, X.509 certificates, transport level security: SSL and TLS, Intrusion, and types and configurations of firewalls.

*PREREQ: CPIT-370*

### **CPIT-430 Decision Support Systems (3 Credits)**

The objective of this course is to explore the concept of decision support systems and components. It gives knowledge of decision-making models under different circumstances, as well as identifies the intelligent systems and their role in the process of decision support. It also teaches how to deal with crises and disasters using decision support systems.

*PREREQ: CPIT-330*

### **CPIT-435 Needs Assessment and Technology Evaluation (2 Credits)**

The objective of this course is to explore the methods of identifying organizational needs. Topics include the types of the questions expected in personal interviews, the needed skills in how to identify and assess appropriate technology to meet the needs of the business, and how to follow up, make changes, and find updated technical solutions with the development and renewal requirements in the future.

*PREREQ: CPIT-220, CPIT-250*

### **CPIT-436 E-Business Technology (3 Credits)**

The objective of this course is to explore e-business technology and the use of computer techniques in updating business processes, which are designed to improve performance and reduce costs.

*PREREQ: CPIT-435*

### **CPIT-440 Data Mining and Warehousing (3 Credits)**

The objective of this course is to explore the different knowledge extraction methods and their representation techniques as well as knowledge engineering. It also introduces the different basic artificial intelligence theories that qualify the students to understand the course contents. Topics include an introduction to data mining and warehousing, data warehousing and OLAP technology, classification and prediction, mining frequent patterns, associations and correlations,

review of probability and statistics, and data preprocessing.

*PREREQ: CPIT-240*

### **CPIT-445 Knowledge Engineering (3 Credits)**

The objective of this course is to explore the different knowledge extraction methods and their representation techniques as well as knowledge engineering. It also introduces the different basic artificial intelligence theories that qualify the students to understand the course contents.

*PREREQ: CPIT-440*

### **CPIT-455 Software Engineering (II) (3 Credits)**

The objective of this course is to explore software advanced engineering principles and techniques used in the specification, design, and testing of software systems. Topics include software engineering confirmation and authentication, methods and ways of software testing building and managing software development teams, scientific and practical methods for calculating the costs of software development, quality management in software development, processes development in software production, and reconstruction management in software production.

*PREREQ: CPIT-251*

### **CPIT-456 Software Economics (3 Credits)**

The objective of this course is to explore concepts in software economics. Topics include important economic concepts in the process of software development, building and empowering software development teams, continuous improvement of procedures in building software process, production tasks in the process of applications development, economies of scale operations related to software development, optimizing restricted operations and cost estimation to build software, models of integrated operations, spiral model to build software, and risk management in building software.

*PREREQ: CPIT-251*

### **CPIT-470 Networks Administration (3 Credits)**

The objective of this course is to explore the principles of network administration. Topics include network OSI layers and CISCO IOS configuring devices, IP addressing and subnetting, introduction to routing, static routing, default routing, dynamic routing, RIP1 and RIP2, troubleshooting, routing table lookup process, OSPF, switching & switch configuration, switch security, VLANs, spanning tree protocol, VTP, inter VLAN routing, and network troubleshooting.

*PREREQ: CPIT-370*

### **CPIT-475 Wireless Data Networks (3 Credits)**

The objective of this course is to explore principles of IT Infrastructure, Networking and System Administration. Topics include cellular architecture, GSM, GPRS, UMTS, 802.11 WLAN infrastructure designing, and planning and administration.

*PREREQ: CPIT-370*

### **CPIT-480 Fundamentals of Instructional Techniques (3 Credits)**

The objective of this course is to study the planning, organization and development of educational materials. Also, it uses the instructions system design model (ISD) to analyze, design, deliver, and evaluate instructions.

*PREREQ: CPIT-380*

### **CPIT-485 User-Centered System Design (3 Credits)**

The objective of this course is to explore the concepts of instruction between humans and computers and how to apply the rules of design and quality assurance in interactive systems.

*PREREQ: CPIT-280*

### **CPIT-490 Selected Topics in IT (3 Credits)**

The objective of this course is to explore selected topics on the latest advances in the field of Information Technology (topics determined by the Council of the Information Technology Department).



### **CPIT-498 Senior Project (I) (1 Credit)**

This course is the first part of a sequence of two courses that constitute the graduation capstone project. In this course the students integrate the knowledge areas of IT into a development-based project in which they deliver proposals, reports, and oral presentations. The course topics cover planning, analysis, and design phases of the projects.

### **CPIT-499 Senior Project (II) (3 Credits)**

This course is the second part of a sequence of two courses that constitute the graduation capstone project. This course aims to execute what was presented in CPIT-498 – the students present two reports and two presentations of the graduation project. The courses topics cover detail design, coding, testing, and project implementation.