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Ministry of Education

King Abdulaziz University

UNDERGRADUATE CATALOG

Faculty of Computing and Information Technology

Academic Year

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Contents

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Introduction

About the Faculty

Initially a part of the Mathematics Department, the computer group was transformed into the Department of Computer Science under the Faculty of Sciences at the beginning of academic year 1405/06 A.H (1985/86) offering a classic 4-year computer science program. For many years the Computer Science Department contributed to the preparation of computing specialists producing numerous generations of technical professionals who actively participated in disseminating e-culture in society. Department graduates played an important role in national economic development in both government and private sector through involvement in major information technology projects.

Twenty years later, Royal Decree in 1425 A.H (late 2004) founded the Faculty of Computing and Information Technology, (FCIT). A building located in the north side of the university was renovated to enable the college to launch in the academic year 2006/07. The new college started with the old Department of Computer Science as its first department. Soon two new departments followed, and FCIT started admitting students to its new programs, including a modernized computer science program. In the academic year 1432/33 (2011/12), the women moved to a new building. Currently the college offers its programs through three departments operating in both the Men's and Women's campuses. They are:

- Department of Computer Science
- Department of Information Technology
- Department of Information Systems

FCIT provides modern laboratories, smart class rooms, and other facilities. Students and faculty are encouraged to check the FCIT Safety Guide, and the FCIT Labs and Facilities Guide for their campus. Students are exposed to a variety academic and extracurricular activities. The college strives to attract talented staff both national and international to participate in advancing education and research in the college.

With new well-equipped buildings, international collaboration with highly-cited researchers, and prestigious academic accreditation for its bachelor programs, FCIT is well on its way to become a regionally prestigious school of computing.

FCIT Strategy

Vision

To become a leading regional institution, offering academic research and consultation programs in computing and information technology.

Mission

FCIT is an institute of higher learning specialized in computing, that strives to deliver high-quality academic research and consultation programs.

Goals

To serve the development plans of the nation by preparing qualified professional human resources to meet society's needs for computing specialists. FCIT additionally contributes to development of human knowledge in the field of Informatics, and to the adoption of

cutting-edge research programs that effectively contribute to serving society through consultations and solutions that address national, regional and local technology issues.

Industrial Advisory Board

The Industrial Advisory Board (IAB) is a 2-year term industry-based committee intended to help FCIT ensure that its bachelor programs' graduates better fit the needs of its employer stakeholders. The board members are leading non-academic professionals selected from a variety of backgrounds and industries that traditionally seek graduates of computing programs.

Board members generally advise FCIT on the needs of the job market, and the qualities that they seek when in prospective employees. One of the most important roles of IAB is to help FCIT review and develop valuable educational objectives for its programs. Another important role is to help provide students with opportunities to gain real world experience during their summer training and capstone coursework.

Student Focus Group

The student focus group is a one-year term student committee meant to help FCIT ensure that its bachelor programs and services better fit the needs of the very students that it intends to serve. The group members are students from a variety of backgrounds nominated by their departments.

Group members generally advise FCIT on student views, experiences and needs. One of the most important roles of the group is to help FCIT review the outcomes and educational objectives of its programs. As a focus group they provide direct input that augments survey-based assessments. Members are occasionally asked to attend department and college council meetings as student representatives.

Capstone Experience

Students in their last year of study are exposed to a significant 2-semester personal or group accomplishment capstone experience through the 498–499 senior project course sequence. This experience provides students with the opportunity to bring together knowledge and skills acquired during their studies. It also allows departments to assess the extent of achievement of their program outcomes. Students go through requirements development, design, implementation, testing, and documentation activities. Students are required to write a proposal, submit a final report, and give a final presentation.

Student Activity

FCIT offers a range of extra-curricular activities through its own student competitions, clubs and activity committees. Students can participate in their choice of activities related to computing, Islamic awareness, culture and arts, sports, and social activity. FCIT encourages its students to participate in various student events and competitions inside and outside the university.

Alumni

FCIT, through its Graduates Affairs Unit, works to keep in touch with its former students in order to make optimal use of their experiences and achievements to benefit current students. Alumni can help the college review and assess educational objectives for its programs, offering valuable insights from their own experiences.

Faculty Development

The college has a dedicated faculty development officer with a focused mission and adequate resources. A two year development plan has been formalized, based on on-going stakeholder feedback from faculty, college administrators, students and the Industrial Advisory Board. While development efforts focus primarily on faculty members, they also include supporting staff such as lab instructors and administrators, who are involved in academic operations. Development activities are expected to cover teaching and learning, research skills, and professional improvement.

Undergraduate Programs and Degrees

The faculty offers three 5-year bachelor-level programs leading to degrees as follows:

Program	Awarded Degree
Computer Science	Bachelor of Science in Computer Science
Information Systems	Bachelor of Science in Information Systems
Information Technology	Bachelor of Science in Information Technology

Admission

FCIT admits students to its general program after they successfully complete all University Preparatory Year courses. FCIT sets the following conditions for the admittance of interested students within the capacity set by the College Council:

1. Minimum grade of B in English 104
2. Minimum grade of C+ in Math 110

Program Outcomes

Bachelor's programs have educational objectives that have been reviewed with student and industry representatives. Program educational objectives (ABET[1]) are broad statements that describe what graduates are expected to attain within a few years of graduation. They are based on the needs of the program's constituencies. The objectives of each program are listed under its host department's section.

Student outcomes (ABET) are statements that describe what students are expected to know and be able to do by the time of graduation. These relate to skills, knowledge, and behaviors that students acquire as they progress through the program.

Bachelor programs share the following ABET outcomes adopted by FCIT:

ABET-A	An ability to apply knowledge of computing and mathematics appropriate to the discipline;
ABET-B	An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
ABET-C	An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs;
ABET-D	An ability to function effectively on teams to accomplish a common goal;
ABET-E	An understanding of professional, ethical, legal, security and social issues and responsibilities;
ABET-F	An ability to communicate effectively with a range of audiences;
ABET-G	An ability to analyze the local and global impact of computing on individuals, organizations, and society;
ABET-H	Recognition of the need for and an ability to engage in continuing professional development;

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[1] Formerly, Accreditation Board for Engineering and Technology (www.abet.org).

ABET-I   An ability to use current techniques, skills, and tools necessary for computing practice.

Program Assessment

FCIT is committed to meaningful and sustainable assessment of its bachelor's programs. To that end, FCIT developed a formal assessment plan that involves a variety of direct and indirect assessments of courses, programs, outcomes, and overall student and faculty experiences. The plan specifies which assessments to perform and identifies data sources, frequency and stakeholders of each assessment. A robust assessment process is in place to ensure consistent results. An Academic Assessment Unit is responsible for administering the assessments according to plan and delivering results to their respective stakeholders. Departments, administrators, and faculty members are free to concentrate on evaluation and improvement. Electronic academic systems are in-place to help facilitate performance assessment and independent review.

Degree Requirements

To obtain a bachelor's degree, all students must satisfy the following:

1. Have a minimum Grade Point Average (GPA) of 2.75.
2. Complete 140 credits according to the following table:

	Requirements		Credits
1	University		14
2	Preparatory Year		27
3	Collage	Required	24
		Free*	9
4	Department	Required	57
		Elective+	9
	Total 140		

*University-wide free electives: students are allowed to choose courses outside the department/college.

+Department electives: students choose courses from list of electives offered by their department.

University General Requirements

Code	Course Title	Credits	Prerequisite
ISLS-101	Islamic Culture (1)	2	---
ISLS-201	Islamic Culture (2)	2	ISLS-101
ISLS-301	Islamic Culture (3)	2	ISLS-201
ISLS-401	Islamic Culture (4)	2	ISLS-301
ARAB-101	Arabic Language (1)	3	ARAB-101
ARAB-201	Arabic Language (2)	3	---
	Total 14		

University Preparatory Year Requirements

Code	Course Title	Credits	Prerequisite
PHYS-110	General Physics (1)	3	---
MATH-110	General Mathematics (1)	3	---
STAT-110	General Statistics (1)	3	---
CHEM-110	General Chemistry I	3	---
BIO-110	General Biology (1)	3	---
COMM-101	Communication Skills	3	---
CPIT-100	Computer Skills	3	---
ELI-101	English Language I	0	---
ELI-102	English Language II	2	---
ELI-103	English Language III	2	ELI-102
ELI-104	English Language IV	2	ELI-103
	Total 27		

College General Requirements

Code	Course Title	Credits	Prerequisite
STAT-210	Probability Theory	3	STAT-110
CPIT-201	Introduction To Computing	3	---
CPCS-202	Programming I	3	---
CPCS-203	Programming II	3	CPCS-202
CPCS-204	Data Structures I	3	CPCS-203
CPIT-221	Technical Writing	2	---
CPIS-334	Introduction To Software Project Management	2	---
CPIS-428	Professional Computing Issues	2	CPXX-323
CPCS-222	Discrete Structures I	3	---
	Total 24		

Department Requirements

In addition to the university and college requirements, departments require the following.

1. Completion of 57 credits listed by department as required.
2. Completion of at least 9 credits selected from department's elective course list.

Required and elective courses for each program are listed under *Program Courses* in the corresponding department's section.

Specialization Tracks

Students are generally free to take any offered elective courses that they choose to satisfy the department's elective requirement. However, they can be issued a Track Certificate

from the department if they complete 2-3 elective courses from the same group. Details are listed under *Program Tracks* in the corresponding department's section.

Course Numbering

The left-most digit indicates the level of the course while the middle digit indicates the topic area. The right-most digit indicates the sequence of the course within the topic area. The course code of the department is added to designate its courses as follows:

Department	Course Code
Computer Science	CPCS
Information Technology	CPIT
Information Systems	CPIS

Common Degree Plan

University Preparatory Year Plan

All students admitted to King Abdulaziz University's Science Track Preparatory Year Program take the following courses in their first year.

First Semester

Code	Title	Cr	Pre.
CPIT-100	Computer Skills*	3	---
ELI-101	English Language I	0	---
ELI-102	English Language II	2	---
MATH-110	General Mathematics (1)	3	---
PHYS-110	General Physics (1)	3	---
	Total 11		

Second Semester

Code	Title	Cr	Pre.
COMM-101	Communication Skills+	3	---
ELI-103	English Language III	2	ELI-102
ELI-104	English Language IV	2	ELI-103
STAT-110	General Statistics (1)	3	---
CHEM-110	General Chemistry I	3	---
BIO-110	General Biology (1)	3	---
	Total 16		

*Alternatively, the course "Communication Skills" (COMM 101).
+Alternatively, the course "Computer Skills" (CPIT-100).

College Freshman Plan

All students admitted to FCIT take these courses on their first semester in college.

Third Semester

Code	Title	Cr	Pre.
ISLS-101	Islamic Culture (1)	2	---
CPIT-201	Introduction to Computing	3	---
STAT-210	Probability Theory	3	STAT-110
CPCS-202	Programming I	3	---
CPIT-221	Technical Writing	2	---
	Total 13		

Academic Regulations and Policies

Academics are largely governed by the regulations of undergraduate studies and exams in the Kingdom of Saudi Arabia issued by the Ministry of Higher Education, and rules of King Abdulaziz University published by its Deanship of Admission and Registration. Both students and faculty are encouraged to check relevant academic rules and procedures in the latest FCIT *Undergraduate Student Guide* available from the Academic Affairs Unit. The most important information is highlighted next.

Academic Integrity

Scholastic Honesty Policy

We are serious about creating an honest and ethical learning environment. FCIT will not tolerate dishonest actions such as cheating and plagiarism, or disruptive behavior that violates its rules and conduct expectations. Offenders will be subject to disciplinary measures in accordance with student disciplinary regulations as issued by the University Council. FCIT reserves the right to use various means to detect and document dishonest conduct.

Code of Student Conduct

FCIT expects all of its students to conduct themselves in a respectful, ethical, and professional manner. In addition to guidelines outlined in KAU document of Student Rights and Obligations, students are expected to adhere to the following:

- Respect and be courteous to faculty members, staff, and fellow students.
- Respect faculty property both physical and electronic.
- Respect faculty rules and regulations.
- Attend classes regularly and punctually.
- Complete all assignments on time and honestly.
- Actively participate in faculty activities.
- Lead by example and be a good representative of KAU students.

Student Appeals

Students can appeal any decisions according to standard university process published in Arabic within the *KAU Regulations Governing Student Rights and Obligations* manual, available on the KAU website under Deanship of Admissions and Registration.

Academic Advising

Academic advising is a key to success at any higher education institution. FCIT considers academic advisers a valuable resource for students as they help plan their undergraduate career and, ultimately, prepare them for graduation. Academic advising means guiding the students/advisees on different issues related to their academic progress and to help them find solutions to different academic problems. Academic advising is related to assisting students with educational choices, degree requirements, academic policies/procedures, as well as broader concerns such as future career and graduate school options.

The four stakeholders involved in the process of academic advising at FCIT are:

1. The advisee/student.
2. The advisor/faculty member.
3. The Head of the Academic Advising Committee or the Head Academic Advisor.
4. The department/program.

Details of academic advising procedures and policies can be found in the FCIT Academic Advising Manual available from the Academic Affairs Unit.

Roles and Responsibilities

An academic advisor is a selected faculty member of the department for the process of guiding the students/advisee on different issues related to their academic progress and problems. Maximum number of students per academic advisor is twenty (20). Following are the responsibilities defined for the academic advisor:

1. Advise undergraduate students and address their academic concerns.
2. Follow and report student progress via advising form particularly for struggling students.
3. Communicate with their students and respond to their requests and questions through the online academic system ODUS Plus.
4. Participate in orientation and advising services.
5. Assist students in selecting suitable senior projects and supervisors.
6. Check fulfillment of graduation requirements.

The advisee/student has the responsibility to:

1. Recognize that advising is a shared responsibility and accept responsibility for all decisions.
2. Share personal values, abilities and goals.
3. Prepare for advising sessions and bring relevant materials.
4. Meet with the advisor when asked or when in need of assistance.
5. Learn policies, procedures and requirements, i.e. add/drop deadlines, graduation and general education policies.

Credit Hour Limits

The university-wide policy of credit hours limit vs. Grade Point Average (GPA) is outlined in the table below as given by the Deanship of Admission and Registration. These limits do not apply to the summer semester.

GPA	Credits (Not Graduating)	Credits (Graduating)
Less than 2	12 – 13	12 + one course only
2 – 2.75	15 – 16	15 + one course only
2.75 – 3.74	18 – 19	18 + one course only
More than 3.75	18 – 19	Maximum 24

Grade Point Average (GPA) Calculation

The minimum course passing grade is "Pass" (D), which corresponds to 60% of final marks obtained by students and a GPA of 2 out of 5. The Grade Point Average (GPA) is calculated as an average of points, obtained according to the table below, weighted by course credits. Although students are allowed to repeat any course, new grades do not

cancel out existing ones. Existing grades are kept in students' transcripts and are counted in their GPA. The details of transforming marks into grade symbols and grade points are as follows:

Range of Marks	Grade Symbol	Grade Points
95 – 100	A +	5.0
90 – 94	A	4.75
85 – 89	B +	4.5
80 – 84	B	4.0
75 – 79	C +	3.5
70 – 74	C	3.0
65 – 69	D +	2.5
60 – 64	D	2.0
Less than 60	F	1.0

Additionally, special grades may be awarded. The following are the most common. The official transcript issued by King Abdulaziz University has a complete list.

- **The grade "Incomplete" (IC):** if a student, for compelling reasons, becomes unable to complete the requirements of a registered course, they can request a grade of (IC). The case should be presented to the Department Council for approval. Students have to complete course requirements during the following semester otherwise their grade will automatically change to "Fail" (F).
- **The grade "In-Progress" (IP):** some students may need more time to complete course requirements in cases such as the senior project. They can be awarded a grade of (IP) and allowed to postpone their grade for no more than two semesters.
- **The grades "No grade-pass/fail" (NP/NF):** these grades are awarded for courses that require demonstrating satisfactory performance such as the summer training.
- **The grade "Denied" (DN):** awarded in cases where student class absence exceeds limits set by King Abdulaziz University within national guidelines, as detailed in the section *Absence from Classes*. DN corresponds to 1.0 point in GPA calculation.

Absence from Classes

Absence exceeding 25% of course classes is grounds for granting a grade of "Denied" (DN), and being denied admission to the course final exam. Students with absence of 25%-50% may submit an excuse request to the Faculty Council supported by proper documentation.

Transfer Policies

Transfers between colleges within King Abdulaziz University or from other institutions are handled by the Deanship of Admission and Registration subject to approval by FCIT. Transfers inside FCIT are handled by its Academic Affairs Unit.

Students may transfer to FCIT subject to the following:

First:
- A student must achieve at least B+ in MATH 110 or C+ in (CPCS 202 or CPCS 203).
- A student must achieve at least B+ in ELI 104 or B in (CPIT 201 or CPIT 221).

- A minimum of 3.0 GPA.

Second:

- Only 15 seats will be available for transferring students per semester.

Third:

- In case more than 15 students achieved the requirements for transferring to FCIT, the 15 seats will be given based on the students' grades in the last course taken from the following tracks:
  - First Track: MATH 110, CPCS 202, CPCS 203
  - Second Track: ELI 104, CPIT 201, CPIT 221

Course transfer rules are as follows:

1. Course must be equivalent to similar FCIT program course based on course syllabi.
2. The number of credits must match corresponding FCIT program course.

Students may transfer from one program to another (change their major) within FCIT only once if they have not completed 50% of graduation credit hours in their original program. Transferred students should complete all the requirements of the new program. Credits from the original program will remain in the student's record and will contribute to their GPA.

Department of Computer Science

About the Department

The Department of Computer Science (CS) was established in 1985 to advance research, knowledge, and innovation in computing. It launched again in 1427 A.H. (2006) as a part of the faculty with a more specialized role that spans the range from theoretical algorithmic foundations to scientifically-grounded application areas in computing systems, network computing, programming systems, intelligent systems, computer graphics, high performance computing, and software engineering. The department offers a modern accredited bachelor's degree program, a mature, second-generation research-based master's program, and a Ph.D. program. These programs are supported by experienced faculty members and state-of-the-art specialized labs, including robotics and brain-computer interface labs.

Department Vision

A strong academic environment recognized nationally and internationally in delivering excellent computer science education and conducting distinct research addressing needs of the community we serve.

Department Mission

To provide superior educational experiences in areas related to computer science at both undergraduate and graduate levels. To provides an environment conducive to imparting quality education and to conducting distinctive research in theoretical and applied computing.

The Computer Science Program

Demand for computing professionals with scientific background has grown in the past decade as a result of increased demand for sophisticated computing environments, applications, and scientific research inside and outside of academia

The Department of Computer Science offers a five-year academic program that provides a balanced mix of strong theory, application and practice. It incorporates the scientific foundations of computing with advanced applications which demand sophisticated knowledge of computing systems, programming and problem-solving tools and techniques.

This program builds on 26 credits of university-required course work in Islamic studies, Arabic language and communication skills, as well as a full academic year Preparatory Program shared by Science, Medical, and Engineering. It also shares 24 credits of college-required basic computing coursework with other computing programs in the college.

Program Mission

To equip software and computing specialists with in-depth theoretical knowledge and versatile technical and professional skills that enable them to master, improve and efficiently work in a wide range of scientific and technical settings.

Program Educational Objectives

- PEO-1: Have a successful career in the practice of computer science and related applications built on their understanding of formal and applied methods for problem-solving, design of secure and dependable computer systems, and development of effective software systems and algorithmic applications.
- PEO-2: Advance in responsibility and leadership and contribute as active partners in the economic growth and the sustainable development of Saudi society.
- PEO-3: Engage in professional development and/or graduate studies to pursue flexible career paths amid future technological changes.

Student Outcomes

In addition to the common student outcomes ABET-A to ABET-I, listed under *Program Outcomes* on page 5, the CS program addresses these specific outcomes:

ABET-J   An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

ABET-K   An ability to apply design and development principles in the construction of software systems of varying complexity.

Program Tracks

Students may receive a Track Certificate if they take **2 elective courses** from the same group.

Track Name	Electives	
High Performance Computing	CPCS-413	
	CPCS-414	
	CPCS-494*	
Network Computing	CPCS-372	
	CPCS-473	
	CPCS-474	
Computer Programming	CPCS-403	
	CPCS-466	
	CPCS-405	*When CPCS-494 is offered in the same field.
	CPCS-494*	
Intelligent Systems	CPC-432	
	CPCS-433	
	CPCS-482	
Software Engineering	CPCS-353	
	CPCS-404	
	CPCS-454	
	CPCS-457	
Information Security	CPCS-425	
	CPCS-463	
	CPCS-464	
	CPCS-494*	

Program Degree Plan

Fourth Semester

Code	Title	Cr	Pre.
ISLS 201	Islamic Culture (2)	2	ISLS 101
ARAB 101	Arabic Language (1)	3	---
MATH-202	Calculus II	3	MATH-110
CPCS-203	Programming (II)	3	CPCS-202
CPCS-222	Discrete Structures (I)	3	---
	Total 14		

Fifth Semester

Code	Title	Cr	Pre.
CPCS-204	Data Structures (1)	3	CPCS-203
CPCS-212	Applied Math for Computing (1)	4	MATH-202
CPCS-211	Digital Logic Design	3	CPIT-201
---	Lab Science (II) *	4	---
	Total 14		

Sixth Semester

Code	Title	Cr	Pre.
STAT 352	Applied Probability & Random Processes	3	STAT 210
CPCS-301	Programming Languages	3	CPCS-204 CPCS-222
CPCS-241	Database 1	3	CPCS-204
CPCS-214	Computer Organization and Architecture (I)	3	CPCS-211
CPCS-223	Analysis & Design of Algorithms	3	CPCS-204
	Total 15		

Seventh Semester

Code	Title	Cr	Pre.
CPIS-334	Introduction To Software Project Management	2	---
CPCS-324	Algorithms & Data Structures (II)	3	CPCS-222 CPCS-223
CPCS-331	Artificial Intelligence (I)	3	CPCS-204 CPCS-223
CPCS-351	Software Engineering (I)	3	CPCS-204
CPCS-361	Operating Systems (I)	3	CPCS-214 CPCS-204
CPCS-371	Computer Networks (I)	3	CPCS-214
	Total 17		

Eighth Semester

Code	Title	Cr	Pre.
ISLS 301	Islamic Culture (3)	2	ISLS 201
CPCS-302	Compiler Construction	3	CPCS-301
CPCS-381	Human-Computer Interaction (I)	2	CPCS-204
CPCS-391	Computer Graphics (I)	3	CPCS-204 CPCS-212
---	College Free (I)*	3	---
	Total 13		

Summer Semester

CPCS-323 Summer (Workplace) Training (I) – Credit: 0 Training: 200 Hours

Ninth Semester

Code	Title	Cr	Pre.
ARAB 201	Arabic Language (2)	3	ARAB 101
CPCS-498	Senior Project (I)	1	Senior Level
---	Department Elective (I)*	3	---
---	College Free (II)*	3	---
---	College Free (III)*	3	---
	Total 13		

Tenth Semester

Code	Title	Cr	Pre.
ISLS 401	Islamic Culture (4)+	2	ISLS 301
CPCS-499	Senior Project (II)	3	CPCS-498
---	Department Elective (II)*	3	---
---	Department Elective (III)*	3	---
CPIS-428	Professional Computing Issues	2	CPCS-323
	Total 13		

*Subject to approval by department and academic advisor   + General ethics

Program Courses

It is worth noting that course codes consist of two parts: the first two letters (CP) represent the faculty code and the second two letters represent the department code (CS). The following table lists topic areas indicated by the middle digits in course numbers:

Middle Digit	Topic Areas
0	Programming Systems
1	Architecture & Organization
2	Theoretical Foundations & Algorithms
3	Intelligent Systems
4	Database & Information Retrieval
5	Software Engineering
6	Computing Systems
7	Network Computing
8	Human Computer Interaction
9	Applications & Advanced Topics

Required Course List

Code	Course Title	Credits	Prerequisite
---	Lab Science (II)*	4	---
CPCS-211	Digital Logic Design	3	CPIT-201
CPCS-212	Applied Math for Computing 1	4	MATH-202
CPCS-214	Computer Organization & Architecture 1	3	CPCS-211
CPCS-223	Analysis & Design of Algorithms	3	CPCS-204
CPCS-241	Database 1	3	CPCS-204
CPCS-301	Programming Languages	3	CPCS-204 CPCS-222
CPCS-302	Compiler Construction	3	CPCS-301
CPCS-323	Summer (workplace) Training I	0	---
CPCS-324	Algorithms & Data Structures (II)	3	CPCS-222 CPCS-223
CPCS-331	Artificial Intelligence 1	3	CPCS-204 CPCS-223
CPCS-351	Software Engineering 1	3	CPCS-204
CPCS-361	Operating Systems 1	3	CPCS-214 CPCS-204
CPCS-371	Computer Networks 1	3	CPCS-214
CPCS-381	Human-Computer Interaction 1	2	CPCS-204
CPCS-391	Computer Graphics 1	3	CPCS-204 CPCS-212
CPCS-498	Senior Project 1	1	Senior Level
CPCS-499	Senior Project (II)	3	CPCS-498
MATH-202	Calculus II	3	MATH-110
STAT-352	Applied Probability & Random Processes	3	STAT-210
	Total 56 Credits+		

*Must include lab component subject to approval by department and academic advisor. +Students must take a minimum of 1 credit from College of Sciences to complete the 57 credit department requirement.

Elective Course List

Code	Course Title	Credits	Prerequisite
CPCS-353	Software Eng. Practices	3	CPCS-351
CPCS-372	Computer Networks (II)	3	CPCS-371
CPCS-403	Internet Application Programming	3	CPCS-371
			CPCS-324
CPCS-404	Component-Based Computing	3	CPCS-351
CPCS-405	Software Technology Topics	3	CPCS-351
CPCS-413	Computer Architecture (II)	3	CPCS-214
CPCS-414	High Performance Computing	3	CPCS-361
CPCS-424	Theory Of Computation	3	CPCS-212
			CPCS-222
CPCS-425	Information Security	3	CPCS-361
			CPCS-371
CPCS-432	Artificial Intelligence (II)	3	CPCS-331
CPCS-433	Artificial Intelligence Topics	3	CPCS-331
CPCS-442	Database (II)	3	CPCS-241
CPCS-454	Object-Oriented Analysis & Design	3	CPCS-351
CPCS-457	Software Engineering Theory	3	CPCS-351
CPCS-462	Operating Systems (II)	3	CPCS-361
CPCS-463	Computing Systems Security	3	CPCS-361
			CPCS-371
CPCS-464	Dependable Computing	3	-
CPCS-465	Performance & Modeling of Computing Systems	3	CPCS-324
			CPCS-361
CPCS-466	Systems Programming	3	CPCS-361
CPCS-473	Computer Networks Practice	3	CPCS-371
CPCS-474	TCP/IP & Web Networking	3	CPCS-371
CPCS-482	Multimedia & User Interface Design	3	CPCS-381
CPCS-494	Special/Selected Topics*	3	-

*With department approval.

Department Faculty

Men's Campus

Prof. Maher Khemakhem, Professor, Ph.D. in Digital Electronics and Computer Science, Arabic OCR & Distributed Systems, University of Paris11, France, 1987.

Prof. Fathy Eassa, Professor, Ph.D. in Computer Science, Software Engineering, Al-Azhar University, Egypt, 1989.

Prof. Kamal Jambi, Professor, Ph.D. in Computer Science, Artificial Intelligence, Illinois institute of Technology, USA, 1991.

Prof. Osama Abulnaja, Professor, Ph.D. in Computer Science, Systems Programming and Fault-tolerance, University of Wisconsin, USA, 1997.

Prof. Amin Noman, Professor, Ph.D. in Computer Science, Data Warehousing, University of Manitoba, Canada, 1999.

Dr. Abdullah Basuhail, Associate Professor, Ph.D. in Computer Science, Digital Image Processing, Florida Institute of Technology, USA, 1998.

Dr. Vijey Thayananthan, Associate Professor, Ph.D. in Engineering, Communication Systems, University of Lancaster, UK, 1998.

Dr. Mohamed Dahab, Associate Professor, Ph.D. in Computer Science, Text Mining, Cairo University, Egypt, 2007.

Dr. Wadee Alhalabi, Associate Professor, Ph.D. in Computer Science, Machine Learning, University of Miami, USA, 2008.

Dr. Ahmed Alzahrani, Associate Professor, Ph.D. in Computer Science, Computer Networks, University of Bradford, UK, 2009.

Dr. Imtiaz Khan, Associate Professor, Ph.D. in Computer Science, Artificial Intelligence, University of Aberdeen, UK, 2009.

Dr. Riaz Shaikh, Associate Professor, Ph.D. in Computer Engineering, Computer and Network Security, Kyung Hee University, South Korea, 2009.

Dr. Iyad Katib, Associate Professor, Ph.D. in Computer Science, Telecommunications and Computer Networking, University of Missouri-Kansas City, USA, 2011.

Dr. Muhammad Umair Ramzan, Associate Professor, Ph.D. in Computer Science, Artificial Intelligence, Vrije Universiteit Amsterdam, Netherlands, 2012.

Dr. Muhammad Al-Hashimi, Assistant Professor, Ph.D. in Computer Science, Fault-Tolerant Architectures, Texas A&M University, USA, 2000.

Dr. Wajdi Al Jedaibi, Assistant Professor, Ph.D. in Computer Engineering, Software Engineering and Concurrent Systems, George Mason University, USA, 2001.

Dr. Mohammed Ameen, Assistant Professor, Ph.D. in Computer Science, Artificial Intelligence and Image Analysis, George Washington University, USA, 2002.

Dr. Waseem Ahmed Kareem Abdulkhayoom, Assistant Professor, Ph.D. in Software Engineering, Curtin University, Australia, 2008.

Dr. Syed Hassan, Assistant Professor, Ph.D. in Network Security, University of Franche-Comté, France, 2012.

Dr. Aiiad Albeshri, Assistant Professor, Ph.D. in Information Technology, Security in Cloud Computing, Queensland University of Technology, Australia, 2013.

Dr. Nawaf Alkharboush, Assistant Professor, Ph.D. in Computer Science, Data Mining, Queensland University of Technology, Australia, 2013.

Dr. Abdulmohsen Almalawi, Assistant Professor, Ph.D. in Computer Science, RMIT University, Australia, 2014.

Dr. Khalid Allehaibi, Assistant Professor, Ph.D. in Computer Science, De Montfort University, UK, 2014.

Dr. Abdullah Algarni, Assistant Professor, Ph.D. in Software Engineering and Software Security, Colorado State University, USA, 2014.

Dr. Fahad Al Qurashi, Assistant Professor, Ph.D. in Networks and Communications, Florida Institute of Technology, USA, 2015.

Dr. Fawaz Alsolami, Assistant Professor, Ph.D. in Computer Science, Artificial Intelligence, King Abdullah University of Science and Technology, Saudi Arabia, 2016.

Dr. Emad Jaha, Assistant Professor, Ph.D. in Computer Science, University of Southampton, UK, 2016.

Dr. Khalid Alsubhi, Assistant Professor, Ph.D. in Computer Science, University of Waterloo, Canada, 2016.

Dr. Abdulaziz Attaallah, Assistant Professor, Ph.D. in Software Engineering, University of North Dakota, USA, 2017.

Dr. Emad Albassam, Assistant Professor, Ph.D. in Software Engineering, George Mason University, USA, 2017.

Dr. Turki Turki, Assistant Professor, Ph.D. in Software Engineering, New Jersey Institute of Technology, USA, 2017.

Dr. Yosif Abushark, Assistant Professor, Ph.D. in Software Engineering, RMIT University, Australia, 2017.

Women's Campus

Prof. Hana Alnuaim, Professor, Ph.D. in Computer Science, Multimedia Systems, George Washington University, USA, 2000.

Prof. Arwa Al-Aama, Professor, Doctoral of Science, Multimedia Systems, George Washington University, USA, 2003.

Prof. Omaima Bamasak, Professor, Ph.D. in Computer Science, Electronic Information Security, University of Manchester, UK, 2006.

Dr. Laila Mohamed, Associate Professor, Ph.D. in Computer Engineering, Computer Networks, Anglia Polytechnic University, UK, 1997.

Dr. Etimad Fadel, Associate Professor, Ph.D. in Computer Science, Distributed Systems, De Montfort University, UK, 2006.

Dr. Nadine Akkari, Associate Professor, Ph.D. in Computer Science, Computer Networks, National Superior School of Telecommunications (Ecole Nationale Superieure Des Telecommunications), France, 2006.

Dr. Lamiaa Elrefaei, Associate Professor, Ph.D. in Electrical Engineering, Signal Processing, Benha University, Egypt, 2008.

Dr. Areej Malibari, Associate Professor, Ph.D. in Computer Science, Artificial Intelligence and E-Commerce, University of Essex, UK, 2010.

Dr. Ghadah Aldabbagh, Associate Professor, Ph.D. in Computer Science, Communications and Information Systems, University College London, UK, 2011.

Dr. Zeinab Mahmoud, Assistant Professor, Ph.D. in Computer Engineering, Interactive Computer Graphics, Alexandria University, Egypt, 1991.

Dr. Mai Fadel, Assistant Professor, Ph.D. in Computer Science, Software Engineering, Exeter University, UK, 2007.

Dr. Sahar Shabana, Assistant Professor, Ph.D. in Computer Science, Graphics and Computer Games, George Masson, USA, 2010.

Dr. Sanaa Sharaf, Assistant Professor, Ph.D. in Computer Science, Grid Computing, University of Leeds, UK, 2012.

Dr. Lamya Daghestani, Assistant Professor, Ph.D. in Computer Science, Computer Graphics, University of Huddersfield, UK, 2012.

Dr. Manar Ali, Assistant Professor, Ph.D. in Computer Science, Fault-Tolerant Long Running Transactions, University of Leicester, UK, 2012.

Dr. Salma Kammoun, Assistant Professor, Ph.D. in Computer Science, Computer Vision, University of Sfax, Tunisia, 2013.

Dr. Arwa Allinjawi, Assistant Professor, Ph.D. in Visualization - Human Computing Interaction Education, University of Surrey, UK, 2014.

Dr. Nada Bajnaid, Assistant Professor, Ph.D. in Computer Science, Software Engineering, London Metropolitan University, UK, 2014.

Dr. Amani Jamal, Assistant Professor, Ph.D. in Pattern Recognition, Concordia University, Canada, 2015.

Dr. Maryam Altriki, Assistant Professor, Ph.D. in Artificial Intelligence, University of Sfax, Tunisia, 2015.

Dr. Reem Alnanih, Assistant Professor, Ph.D. in Computer Science, HCI and Quality Measurement, Concordia University, Canada, 2015.

Dr. Amal Almansour, Assistant Professor, Ph.D. in Informatics, Data Mining, Kings College London, UK, 2016.

Dr. Kawthar Moria, Assistant Professor, Ph.D. in Wireless Networks, University of Victoria, Canada, 2016.

Dr. Samar Alkhuraiji, Assistant Professor, Ph.D. in Computer Science, Dynamic Adaptive E-learning Mechanism Based on Learning Styles, University of Manchester, UK, 2016.

Dr. Areej Alhothali, Assistant Professor, Ph.D. in Artificial Intelligence, University of Waterloo, Canada, 2017.

Dr. Dalal Zahran, Assistant Professor, Ph.D. in Web Engineering, Edinburgh Napier University, UK, 2017.

Dr. Lama Al Khuzayem, Assistant Professor, Ph.D. in Data Integration and Semantic Web, Imperial College London, UK, 2017.

Dr. Rania Molla, Assistant Professor, Ph.D. in Information Security, Edinburgh Napier University, Scotland, 2017.

Department of Information Systems

About the Department

The Department of Information Systems (IS) was established as one of three FCIT departments in 2006 with an objective to produce specialists in the integration of Information Systems solutions with business operations to serve the organizations with their requirements of information technologies, enable them to accomplish their goals and support them in the process of decision-making. IS Department philosophy is based upon providing students with a strong theoretical foundation in information systems complemented with an understanding of business principles and practices which are then enhanced through practical application focused on identifying and solving real-world business problems. The primary strength of the IS Department is found in the diversity and academic depth of faculty who are committed to providing robust instruction, quality student support, and opportunities for majors. The department offers quality bachelor's and master's study programs, based on sound scientific foundation applicable to real-life business environments, while a Ph.D. program is in the pipeline.

Department Vision

To be recognized as the preeminent information systems department in the region, known for its scientific and practical innovations and commitment to delivering high-quality education and market-responsive research and services.

Department Mission

To provide students with superior, cutting-edge educational experiences and essential practical skills required to excel in all areas related to information systems.

The Information Systems Program

Demand for computing professionals with background in business organization and process has grown in the past decade as a result of increased demand in both public and private sectors for sophisticated enterprise information systems.

The Department of Information Systems offers a five-year academic program that is designed to combine a strong computing foundation with the information technological needs of business organizations. The program provides students with a strong theoretical foundation in information systems complemented with an understanding of business principles and practices, which are then enhanced through practical application focused on identifying and solving real-world business problems.

This program builds on 26 credits of university-required course work in Islamic studies, Arabic language and communication skills, as well as a full academic year Preparatory Program shared by Science, Medical, and Engineering. It also shares 24 credits of college-required basic computing coursework with other computing programs in the college.

Program Mission

To produce specialists in integrating information systems solutions with administrative operations, who can serve business organizations with their requirements of information technologies, enable them to accomplish their mission-critical goals, and support them in the process of decision-making.

Program Educational Objectives

- PEO-1: Work as integral part of the information systems field, connecting people with information by developing and managing suitable information systems for business and research.
- PEO-2: Advance in their careers through knowledge of computer information systems, communication skills, and understanding of business and contemporary technological issues.
- PEO-3: Actively contribute towards the economic growth and the welfare of udi society through the development and management of information systems for business and research.

Student Outcomes

In addition to the common student outcomes ABET-A to ABET-I, listed under *Program Outcomes* on page 5, the IS program addresses these specific outcomes:

ABET-J   An understanding of processes that support the delivery and management of information systems within a specific application environment.

Program Tracks

Students may receive a Track Certificate if they take **3 elective courses** from the same group.

Track Name	Electives
Decision Support Systems	CPIS-320
	CPIS-420
	CPIS-424
E-System Development	CPIS-382
	CPIS-483
	CPIS-486

Information Systems Environment

Information Systems' students should attain knowledge of the business environments in which their information system skills will be applied professionally. The following courses provide the requisite environments.

No.	Course Code	Course Name	Credit Units	Equivalent Course
1	BUS-230	Introduction to Modern Management	2	BUS-220
2	BUS-232	Modern Business Models	2	MRKT-260
3	CPIS-334	Introduction to Software Project Management	2	
4	BUS-233	Organizational Behavior	2	BUS-320
5	ACCT-333	Principles of Accounting	2	
6	CPIS-380	Introduction to E-Business Systems	3	
7	CPIS-434	IS Strategies and Policies	3	

Program Degree Plan

Fourth Semester

Code	Title	Cr	Pre.
ISLS 201	Islamic Culture (2)	2	ISLS 101
ARAB 101	Arabic Language (1)	3	---
CPCS-203	Programming (II)	3	CPCS-202
CPIS-220	Principles of Information Systems	3	CPCS-202
BUS-220	Principle of Management	3	---
	Total 14		

Fifth Semester

Code	Title	Cr	Pre.
CPCS-204	Data Structures (1)	3	CPCS-203
CPCS-222	Discrete Structures (I)	3	---
CPIS-210	Computer Architecture & Organization	3	CPCS-202
MRKT-260	Modern Business Models	3	BUS-220
---	College Free (I) *	3	---
	Total 15		

Sixth Semester

Code	Title	Cr	Pre.
CPIS-222	Principles of Operating Systems	3	CPIS-210 CPCS-204
CPIS-240	Database Management Systems	3	CPCS-204
CPIS-334	Introduction to Software Project Management	2	---
BUS-320	Organizational Behavior	3	BUS-220
CPIS-250	Analysis & Design (I)	3	CPCS-204
CPIS-370	Fundamentals of Data Networks	3	CPIS-210 CPCS-204
	Total 17		

Seventh Semester

Code	Title	Cr	Pre.
CPIS-351	Analysis & Design (II)	3	CPIS-250
CPIS-354	Principles of Human-Computer Interaction	3	CPIS-250
CPIS-358	Internet Applications & Web Programming	3	CPIS-250
ACCT 333	Principles of Corporate Accounting	2	BUS-220
CPIS-357	Software Quality and Testing	3	CPIS-334 CPIS-250
	Total 14		

Eighth Semester

Code	Title	Cr	Pre.
CPIS-312	Information & Computer Security	3	CPIS-370
CPIS-352	IS Applications Design & Development	3	CPIS-351
CPIS-380	Introduction to E-Business Systems	3	CPIS-351 CPIS-358
ARAB 201	Arabic Language (2)	3	ARAB 101
---	Department Elective (I)*	3	---
	Total 15		

Summer Semester

CPIS-323 Summer (Workplace) Training (I) Credit: 0 Training: 200 Hours

Ninth Semester

Code	Title	Cr	Pre.
ISLS 301	Islamic Culture (3)	2	ISLS 201
CPIS-498	Senior Project 1	1	Senior Level
CPIS-428	Professional Computing Issues	2	CPIS-323
---	Department Elective (II)*	3	---
---	College Free (II)*	3	---
CPIS-342	Data Mining & Warehousing	3	CPIS-240

Tenth Semester

Code	Title	Cr	Pre.
ISLS 401	Islamic Culture (4)+	2	ISLS 301
CPIS-499	Senior Project 2	3	CPIS-498
CPIS-434	IS Strategies and Policies	3	CPIS-220
---	Department Elective (III)*	3	---
---	College Free (III)*	3	---

Total 14	Total 14
*Subject to approval by department and academic advisor	+ General ethics

Program Courses

It is worth noting that course codes consist of two parts: the first two letters (CP) represent the faculty code and the second two letters represent the department code (IS). The following table illustrates the topic areas indicated by the middle digits in course numbers:

Middle Digit	Topic Areas
1	Infrastructure, Architecture & Organization
2	Information Systems Theory & Foundations
3	Management
4	Database & Information Retrieval
5	Software Systems Engineering
6	Computing Systems
7	Networking
8	E-Systems
9	Applications & Advanced Topics

Required Course List

Code	Course Title	Credits	Prerequisite
BUS-220	Principle of Management	3	---
MRKT-260	Principle of Marketing	3	BUS-220
BUS-320	Organizational Behavior	3	BUS-220
ACCT 333	Principles of Corporate Accounting	2	BUS-220
CPIS-210	Computer Architecture & Organization	3	CPCS-202
CPIS-220	Principles of Information Systems	3	CPCS-202
CPIS-222	Principles of Operating Systems	3	CPCS-204 CPIS-210
CPIS-240	Database Management Systems (I)	3	CPCS-204
CPIS-250	Analysis & Design (I)	3	CPCS-204
CPIS-312	Information & Computer Security	3	CPIS-370
CPIS-323	Summer(workplace) Training (I)	0	---
CPIS-342	Data Warehousing and Mining	3	CPIS-240
CPIS-351	Analysis & Design (II)	3	CPIS-250
CPIS-352	IS Applications Design & Development	3	CPIS-351
CPIS-354	Principles of Human Computer Interaction	3	CPIS-250
CPIS-357	Software Quality and Testing	3	CPIS-250 CPIS-334
CPIS-358	Internet Applications & Web Programming	3	CPIS-250
CPIS-370	Fundamentals of Data Networks	3	CPIS-210 CPCS-204
CPIS-380	Introduction to E-Business Systems	3	CPIS-351 CPIS-358
CPIS-434	IS Strategies and Policies	3	CPIS-220
CPIS-498	Senior Project (I)	1	Senior Level
CPIS-499	Senior Project (II)	3	CPIS-498
	Total 60 Credits		

Elective Course List

Code	Course Title	Credits	Prerequisite
STAT 217	Introduction to Quantitative Analysis	3	STAT 210
ACCP 334	Business Analysis	3	MRKT-260
STAT 260	Operations Research	3	STAT 210
CPIS-320	Decision Support Systems & Theory	3	CPIS-220 CPIS-250
CPIS-330	Advanced Project & Quality Management	3	CPIS-334 CPIS-357
CPIS-340	Database Management Systems II	3	CPIS-240
CPIS-350	Systems Design Patterns	3	CPIS-250
CPIS-356	SW Metrics and Economics	3	CPIS-250
CPIS-360	Advanced Information Systems Technologies	3	CPIS-240
CPIS-363	Intelligent Systems	3	CIPS 250
CPIS-382	Development of E-Systems & Interface Design	3	CPIS-358
CPIS-420	Techniques of Decision Support Systems	3	CPIS-320
CPIS-424	Modeling & Simulations	3	CPIS-250
CPIS-430	IS Change Management	3	CPIS-330
CPIS-444	Knowledge Management	3	CPIS-240
CPIS-461	Business Information Systems	3	CPIS-360
CPIS-462	Information Systems Applications	3	CPIS-461
CPIS-464	Distributed Systems	3	CPIS-370
CPIS-465	Geographical Information Systems	3	CPIS-220 CPIS-250
CPIS-466	Office Automation Systems	3	MRKT-260 CPIS-351
CPIS-472	Data Networks Design and Management	3	CPIS-370
CPIS-483	E-Systems Applications	3	CPIS-380
CPIS-486	E-Business Strategies	3	CPIS-380
CPIS-490	Selected Topics in IS*	3	

*With department approval.

Department Faculty

Men's Campus

Prof. Abdul Hamid Ibrahim, Professor, Ph.D. in E-Systems, Essex University, UK, 1985.

Prof. Khaled Fakeeh, Professor, Ph.D. in Computing and Information Systems, Simulation of Disaster Recovery, George Washington University, USA, 1993.

Prof. Ibrahim Albidewi, Professor, Ph.D. in Computer Engineering, Computer Vision, University of Swansea, UK, 1993.

Prof. Hamid Syed, Professor, Ph.D. in Computer Science, Information Security, JMI, India, 1994.

Prof. Syed Haider, Professor, Ph.D. in Computer Science, Super Computing, Canterbury University, UK, 1998.

Prof. Daniyal Alghazzawi, Professor, Ph.D. in Computer Science, Intelligent Information Security, University of Kansas, USA, 2007.

Dr. Hussain Sindi, Associate Professor, Ph.D. in Computer Science, Computer Networks, George Washington University, USA, 1991.

Dr. Gibrael Elamin Abosamra, Associate Professor, Ph.D. in Electronics and Communication Engineering, Pattern Recognition, Cairo University, Egypt, 1992.

Dr. Mostafa Saleh, Associate Professor, Ph.D. in Computer Engineering, Data Analysis and Knowledge Engineering, Mansoura University, Egypt, 2000.

Dr. Abdullah Almalaise, Associate Professor, Ph.D. Computer, Software Engineering, George Washington University, USA, 2003.

Dr. Adnan Albar, Associate Professor, Ph.D. in Computer Science, Mobile Computing and Adaptive Applications, University of Sussex, UK, 2004.

Dr. Usman Khan, Associate Professor, Ph.D. in Information Technology, Information Technology, Integral University, India, 2007.

Dr. Bassam Zafar, Associate Professor, Ph.D. Computer Science (Web-Services), Software Engineering and Formalisim, De Montfort University, Leicester, UK, 2008.

Dr. Muazzam Siddiqui, Associate Professor, Ph.D. in Modeling and Simulation, Data Mining, University of Central Florida, USA, 2008.

Dr. Farrukh Nadeem, Associate Professor, Ph.D. in Computer Science, Grid and Distributed Systems, University of Innsbruck, Austria, 2009.

Dr. Habib Fardoun Fardoun, Associate Professor, Ph.D. in Computer Engineering, Human-Computer Interaction, University of Castilla-La Mancha, Spain, 2011.

Dr. Mahmoud Kamel, Assistant Professor, Ph.D. in Systems and Computer Engineering, Control Engineering, Al-Azhar University, Egypt, 1991.

Dr. Ayman Fayoumi, Assistant Professor, Ph.D. in Computer Engineering, Computer Networks, Colorado State University, USA, 2005.

Dr. Muhammad Aslam, Assistant Professor, Ph.D. in Computer Science, Software Engineering, University of Leipzig, Germany, 2007.

Dr. Sachi Arafat, Assistant Professor, Ph.D., Computer science, University of Glasgow, UK, 2008.

Dr. Khalid Alomar, Assistant Professor, Ph.D. in Computer Science, Human Computer Interaction, University of Bradford, UK, 2010.

Dr. Hossam Hakeem, Assistant Professor, Ph.D. in Computer Science - Pattern Language, De Montfort University, Leicester, UK, 2010.

Dr. Abdullah Albarakati, Assistant Professor, Ph.D. in Computer Science, Software Engineering, University of Sussex, UK, 2012.

Dr. Alaa Al-Magrabi, Assistant Professor, Ph.D. in Software Engineering, La Trobe University, Australia, 2013.

Dr. Fahad M. Al-Otaibi, Assistant Professor, Ph.D. in Decision Support System, De Montfort University, UK, 2014.

Dr. Naif Aljohani, Assistant Professor, Ph.D. in Data Science, University of Southampton, UK, 2014.

Dr. Fahd S. Alotaibi, Assistant Professor, PhD in Computer Science, Natural Language Processing and Data Science, University of Birmingham, UK, 2015.

Dr. Bander Alzahrani, Assistant Professor, Ph.D. in Networks Security, University of Essex, UK, 2015.

Dr. Ahmad Al Fakeeh, Assistant Professor, Ph.D. in Context-aware Systems, De Montfort University, Leicester, UK, 2016.

Dr. Khaled Alyoubi, Assistant Professor, Ph.D. in Computer Science - Database query optimization, Birkbeck University of London, UK, 2016.

Dr. Adel Bahaddad, Assistant Professor, Ph.D. in Enterprise Architecture - System Analysis Griffith University, Australia, 2017.

Dr. Alaa Khadidos, Assistant Professor, Ph.D. in Artificial Intelligence and Computer Vision, Warwick University, UK, 2017.

Dr. Bahjat Fakieh, Assistant Professor, Ph.D. in Computing, Cloud Computing for SMEs, Macquarie University, Australia, 2017.

Dr. Ehab Abozinade, Assistant Professor, Ph.D. in Information Security, George Mason University, USA, 2017.

Women's Campus

Prof. Hanene Ben-Abdallah, Professor, Ph.D. in Computer and Information Science, Software Engineering, University of Pennsylvania, USA, 1996.

Dr. Manal Abdullah, Associate Professor, Ph.D. in Computer and System Engineering, System Engineering, Modern Sciences and Arts University, Egypt, 2002.

Dr. Fatima Baothman, Assistant Professor, Ph.D. in Computer Science, Artificial Intelligence, University of Huddersfield, UK, 2003.

Dr. Salha Abdullah, Assistant Professor, Ph.D. in Information Systems, Process and Information Modelling, University Teknologi Malaysia, Malaysia, 2006.

Dr. Maram Meccawy, Assistant Professor, Ph.D. in E-systems, University of Nottingham, UK, 2009.

Dr. Azrilah Abdulaziz, Assistant Professor, Ph.D. in Decision Support System, Universiti Teknologi MARA, Malaysia, 2009.

Dr. Arwa Jamjoom, Assistant Professor, Ph.D. in Computer Science, Data warehousing, Surrey University, UK, 2011.

Dr. Shaimaa Salama, Assistant Professor, Ph.D. in Data mining, Helwan University, Egypt, 2012.

Dr. Salma Gaffer, Assistant Professor, Ph.D. in Computer Science, Decision Support System, University of Khartoum, Sudan, 2014.

Dr. Kawther Saeedi, Assistant Professor, Ph.D. in Software Engineering, The University of Manchester, UK, 2014.

Dr. Rehab Ashary, Assistant Professor, Ph.D. in Information Security, Colorado State University, USA, 2015.

Dr. Zahia Marouf, Assistant Professor, Ph.D. in Ontology Learning, Djillali Liabes University, Algeria, 2015.

Dr. Dania Aljeaid, Assistant Professor, Ph.D. in Computer Systems Security, Nottingham Trent University, UK, 2016.

Dr. Ghada Amoudi, Assistant Professor, Ph.D. in Data Science, Dalhousie University, Canada, 2016.

Dr. Suaad Alarifi, Assistant Professor, Ph.D. in Information Security, Royal Holloway University of London, UK, 2016.

Dr. Dimah Alahmadi, Assistant Professor, Ph.D. in Machine Learning and Recommender Systems, Manchester University, UK, 2016.

Dr. Amal Babour, Assistant Professor, Ph.D. in Information Systems, Kent State University, USA, 2017.

Dr. Sahar Jambi, Assistant Professor, Ph.D. in Information Systems, University of Colorado, USA, 2017.

Dr. Hanan Alghamdi, Assistant Professor, Ph.D. in Computer Science, E-Systems, University of Surrey, UK, 2017.

Dr. Haya Almagwashi, Assistant Professor, PhD in Information Systems Security, Cardiff University, UK, 2017.

Dr. Najiyah Garoot, Assistant Professor, Ph.D. in Bioinformatics, University of Mass. Lowell., USA, 2018.

Department of Information Technology

About the Department

The Department of Information Technology (IT) was established as one of three FCIT departments in 2006. It was established to keep pace with the scientific, research and practical developments in the field of information technology, especially in computer networks, databases, human-computer interaction, web-page design and other subfields. With the multi-disciplinary nature of the work of today's IT Professional, the IT Department promotes multi-disciplinary research and activities, infusing its faculty with expertise coming from various allied and related fields. The IT department supports its faculty members through development programs for professional training and development, and through recognition of their consultancies and project involvements inside and outside of the university.

Department Vision

To be a leading academic department in the region by paying particularly focused attention to scientific innovations and to provide the labor sectors with highly qualified graduates. To provide the Kingdom of Saudi Arabia and the entire region with research that is concerned with developing the practical sides of life.

Department Mission

To produce high-quality specialists and researchers in the field of information technology, who will serve the community and enrich the research body. The department will provide its graduates with the knowledge and skills to master, improve, and localize the IT solutions that address industry needs.

The Information Technology Program

Demand for computing professionals with expertise in dealing with information technology has grown in the past decade as a result of increased demand in both public and private sectors for sophisticated technology tools, practices and processes.

The Department of Information Technology offers a five-year academic program that is based on scientific foundations. The program aims to produce well-rounded computing professionals who are capable of administering and analyzing organizational situations, design, formulate and evaluate, and develop technological solutions within an organizational and societal context. Focusing on technological solutions for business and government organizations the IT program offers different tracks that provide a range of technological skills for future IT professionals.

This program builds on 26 credits of university-required course work in Islamic studies, Arabic language and communication skills, as well as a full academic Foundation Year Program shared by Science, Medical, and Engineering. It also shares 24 credits of college-required basic computing coursework with other computing programs in the college.

Program Mission

To produce graduates who possess the right combination of knowledge and practical hands-on expertise to take care of both an organization's information technology infrastructure and the users.

Program Educational Objectives

- PEO-1: Be able to professionally design, implement, deliver, integrate and manage Information Technology infrastructures and solutions.
- PEO-2: Be capable of contributing towards recognized and relevant research and pursue postgraduate studies in the field of Information Technology to continually engage in life-long learning.
- PEO-3: Demonstrate preparedness for career advancement in both private and public sectors and grow naturally in rank within the organization to contribute in achieving organizational goals by furnishing proven IT solutions.

Student Outcomes

In addition to the common student outcomes ABET-A to ABET-I, listed under *Program Outcomes* on page 5, the IT program addresses these specific outcomes:

ABET-J An ability to use and apply current technical concepts and practices in the core information technologies.

ABET-K An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.

ABET-L An ability to effectively integrate IT-based solutions into the user environment.

ABET-M An understanding of best practices and standards and their application.

ABET-N An ability to assist in the creation of an effective project plan.

Program Tracks

Students may receive a Track Certificate if they take **at least 2 elective courses** from the same group, or one course from each group for the "Integrated IT" track.

Track Name	Electives
Database	CPIT-340
	CPIT-440
Network	CPIT-375
	CPIT-475
Software Engineering	CPIT-455
	CPIT-456
Integrated IT	One course from each track

Program Degree Plan

Fourth Semester

Code	Title	Cr	Pre.
ISLS 201	Islamic Culture (2)	2	ISLS 101
ARAB 101	Arabic Language (1)	3	---
CPCS-203	Programming (II)	3	CPCS-202
CPCS-222	Discrete Structures (I)	3	---
CPIT-220	Principles of Information Systems	3	CPIT-201
	Total 14		

Fifth Semester

Code	Title	Cr	Pre.
ISLS 301	Islamic Culture (3)	2	ISLS 201
ARAB 201	Arabic Language (2)	3	ARAB 101
CPCS-204	Data Structures (1)	3	CPCS-203
CPIT-210	Computer Architecture & Organization	3	CPCS-202
---	College Free (I)*	3	---
	Total 14		

Sixth Semester

Code	Title	Cr	Pre.
CPIT-240	Database 1	3	CPCS-204
CPIT-250	System Analysis & Design	3	CPCS-204
CPIT-260	Operating Systems	3	CPCS-204 CPIT-210
CPIT-285	Computer Graphics	3	CPCS-204
---	College Free (II)*	3	---
	Total 15		

Seventh Semester

Code	Title	Cr	Pre.
ISLS 401	Islamic Culture (4)+	2	ISLS 301
CPIT-251	Software Engineering (I)	3	CPIT-250
CPIT-280	Human-Computer Interaction	3	CPIT-250
CPIT-370	Computer Networks	3	CPIT-201
---	Department Elective (I)*	3	---
	Total 14		

Eighth Semester

Code	Title	Cr	Pre.
CPIS-334	Introduction To Software Project Management	2	---
CPIT-252	Software Design Patterns	3	CPIT-251
CPIT-330	IT Issues & Management	3	CPIT-220 CPIT-250
CPIT-380	Multimedia Technologies	3	CPIT-285
CPIT-305	Advanced Programming	3	CPCS-204
CPIT-425	Information Security	3	CPIT-370
	Total 17		

Summer Semester

CPIT-323 Summer (Workplace) Training (I) Credit: 0 Training: 200 Hours

Ninth Semester

Code	Title	Cr	Pre.
CPIT-405	Internet Applications	3	CPIT-370 CPIT-252
CPIT-498	Senior Project 1	1	Senior Level
CPIT-345	Database Administration	3	CPIT-240
---	Department Elective (II)*	3	---
---	Department Elective (III)*	3	---
	Total 13		

Tenth Semester

Code	Title	Cr	Pre.
CPIS-428	Professional Computing Issues	2	CPIT-323
CPIT-499	Senior Project 2	3	CPIT-498
CPIT-435	Needs Assessment & Technology Evaluation	2	CPIT-220 CPIT-250
CPIT-470	Networks Administration	3	CPIT-370
---	College Free (III)*	3	---
	Total 13		

*Subject to approval by department and academic advisor   + General ethics

Program Courses

It is worth noting that course codes consist of two parts: the first two letters (CP) represent the faculty code and the second two letters represent the department code (IT). The following table illustrates the topic areas indicated by the middle digits in course numbers:

Middle Digit	Topic Areas
1	Architecture & Organization
2	IT Foundations
3	Theoretical Foundations & Algorithms
4	Database & Information Retrieval
5	Software Engineering
6	Operating Systems
7	Network Computing
8	Human Computer Interaction
9	Applications & Advanced Topics

Required Course List

Code	Course Title	Credits	Prerequisite
CPIT-210	Computer Architecture	3	CPCS-202
CPIT-220	Introduction to IT	3	CPIT-201
CPIT-240	Databases I	3	CPCS-204
CPIT-250	System Analysis & Design	3	CPCS-204
CPIT-251	Software Engineering (I)	3	CPIT-250
CPIT-252	Software Design Patterns	3	CPIT-251
CPIT-260	Operating Systems	3	CPCS-204 CPIT-210
CPIT-280	Human-Computer Interaction	3	CPIT-250
CPIT-285	Computer Graphics	3	CPCS-204
CPIT-305	Advanced Programming	3	CPCS-204
CPIT-323	Summer(workplace) Training I	0	---
CPIT-330	IT Issues & Management	3	CPIT-220 CPIT-250
CPIT-345	Database Administration	3	CPIT-240
CPIT-370	Computer Networks	3	CPIT-201
CPIT-380	Multimedia Technologies	3	CPIT-285
CPIT-405	Internet Applications	3	CPIT-370 CPIT-252
CPIT-425	Information Security	3	CPIT-370
CPIT-435	Needs Assessment & Technology Evaluation	2	CPIT-220 CPIT-250
CPIT-470	Networks Administration	3	CPIT-370
CPIT-498	Senior Project (I)	1	Senior Level
CPIT-499	Senior Project (II)	3	CPIT-498
	Total 57 Credits		

Elective Course List

Code	Course Title	Credits	Prerequisite
CPIT-340	Database (II)	3	CPIT-240
CPIT-375	Data Network Design and Evaluation	3	CPIT-370
CPIT-430	Decision Support Systems	3	CPIT-330
CPIT-436	E-Business Technology	3	CPIT-435
CPIT-440	Data Mining & Warehousing	3	CPIT-240
CPIT-445	Knowledge Engineering	3	CPIT-440
CPIT-455	Software Engineering (II)	3	CPIT-251
CPIT-456	SW Economics	3	CPIT-251
CPIT-475	Wireless Data Networks	3	CPIT-370
CPIT-480	Fundamentals of Instructional Techniques	3	CPIT-380
CPIT-485	User-Centered System Design	3	CPIT-280
CPIT-490	Selected Topics in IT*	3	---

*With department approval.

Department Faculty

Men's Campus

Prof. Hassanin Albarhamtoushy, Professor, Ph.D. Computer Science, Computer Science, Al-Azhar University, Egypt, 1992.

Prof. Ahmad Barnawi, Professor, Ph.D. in Telecommunication Engineering, Mobile Networks, University of Bradford, UK, 2005.

Prof. Muhammed Zafar, Professor, Ph.D. in Computer and Wireless Networks and Systems, University of Strathclyde, UK, 2009.

Dr. Reda Salama, Associate Professor, Ph.D. in Computer Science, Operating Systems, Kassel University, Germany, 1995.

Dr. Tarik Himdi, Associate Professor, Ph.D. in Computer Science, Data & Network Security - Cyber security, George Mason University, USA, 1998.

Dr. Mohamed Buhari, Associate Professor, Ph.D. in Information Technology, Computer Networks, Multimedia University, Malaysia, 2003.

Dr. Abdulrahman Altalhi, Associate Professor, Ph.D. in Computer Science, Engineering and Applied Science, University of New Orleans, USA, 2004.

Dr. Mohammed Alhaddad, Associate Professor, Ph.D. in Computer Science, Distributed Database Systems, University of Essex, UK, 2006.

Dr. Omar Batarfi, Associate Professor, Ph.D. in Computer Science, Computer Security, University of Newcastle upon Tyne, UK, 2007.

Dr. Rizwan Qureshi, Associate Professor, Ph.D. in Computer Science, Software Engineering, National College of Business Administration and Economics, Pakistan, 2009.

Dr. Iftikhar Ahmad, Associate Professor, PhD in Information Technology, Intrusion Detection/ Information Security, Universiti Teknoli PETRONAS, Malaysia, 2011.

Dr. Muhammed Monowar, Associate Professor, Ph.D. in Computer Engineering, Wireless Networks, Kyung Hee University, South Korea, 2011.

Dr. Muhammad Khamis, Assistant Professor, Ph.D. in Electrical Engineering, Fault Tolerance, Gent University, Belgium, 1996.

Dr. Fuad Bajaber, Assistant Professor, Ph.D. in Informatics, Computer Networks, University of Bradford, UK, 2010.

Dr. Georgios Tsaramirsis, Assistant Professor, Ph.D. in Computing, Software Engineering, King's College London, University of London, UK, 2011.

Dr. Saim Rasheed, Assistant Professor, Ph.D. in Computer Science, Brain-Computer Interaction, University of Milan, Italy, 2011.

Dr. Sheikh Bakhsh, Assistant Professor, Ph.D. in Computer Networks, Universiti Teknologi PETRONAS, Malaysia, 2012.

Dr. Mohammed Basheri, Assistant Professor, Ph.D in Computer Science, E-Learning, Durham University, UK, 2013.

Dr. Ahmad Alzahrani, Assistant Professor, Ph.D. in Mobile and Pervasive Computing, La Trobe University, Australia, 2014.

Dr. Rayed Alghamdi, Assistant Professor, Ph.D. in E-commerce, Griffith University, Australia, 2014.

Dr. Fahad Alsolami, Assistant Professor, Ph.D. in Security, University of Colorado, USA, 2015.

Dr. Adeeb Noor, Assistant Professor, Ph.D. in Data Mining and Semantic Web Technologies, University of Colorado at Boulder, USA, 2015.

Dr. Naser Albugami, Assistant Professor, Ph.D. in Computer Science, De Montfort University in Leicester, UK, 2015.

Dr. Khalid Alharbi, Assistant Professor, Ph.D. in Human-Centered Computing, University of Colorado Boulder, USA, 2016.

Dr. Adil Khadidos, Assistant Professor, Ph.D. in Swarm Robotics/A.I., University of Southampton, UK, 2017.

Dr. Fawaz Alsaadi, Assistant Professor, Biometric Security, University of Colorado Springs, USA, 2017.

Women's Campus

Prof. Lamiaa Ibrahim, Professor, Ph.D. in Engineering, Planning Computer Networks, Cairo University, Egypt, 1999.

Dr. Maysoon Abulkhair, Associate Professor, Ph.D. in Computer Science, Human Computer Interaction, University of Sheffield, UK, 2004.

Dr. Asma Cherif, Associate Professor, Ph.D. in Distributed Systems and Communication Networks, Lorraine University, France, 2013.

Dr. Fatma Bouabdallah, Assistant Professor, Ph.D. in Computer Science, Networking, University de Rennes I, France, 2008.

Dr. Mounira Taileb, Assistant Professor, Ph.D. in Computer Science, Machine learning, Information retrieval, University of Paris-Sud 11, France, 2008.

Dr. Wafaa Shalash, Assistant Professor, Ph.D. in Electrical Engineering, Biometrics, Al-mansoura University, Egypt, 2006.

Dr. Saoucene Mahfoud, Assistant Professor, Ph.D. in Networking, University Pierre et Marie Curie (PARIS VI), France, 2010.

Dr. Nermin Ewais, Assistant Professor, Ph.D. in Computer Security, Cairo University, Egypt, 2011.

Dr. Heyfa Ammar, Assistant Professor, Ph.D. in Information Technology and Communication, Video and image processing, Higher School of Communications (SupCom), Tunisia, 2012.

Dr. Sabeen Tahir, Assistant Professor, Ph.D. in Networks, Uniiversity Technology Petronas, Malaysia, 2013.

Dr. Suhair Alshehri, Assistant Professor, Ph.D. in Information Security, Rochester Institute of Technology, USA, 2014.

Dr. Wafaa Alsaggaf, Assistant Professor, Ph.D. in Mobile learning, RMIT University, Australia, 2014.

Dr. Abeer Almakky, Assistant Professor, Ph.D. in Human-Computer Interaction, De Montfor University, UK, 2017.

Dr. Enas Khairullah, Assistant Professor, Ph.D. in Computer Science and Engineering, University of Central Florida, USA, 2017.

Dr. Hanan Alotaibi, Assistant Professor, Ph.D. in Data & Knowledge Management, University of Southampton, UK, 2017.

Dr. Manal Kalkatawi, Assistant Professor, Ph.D. in Bioinformatics, KAUST, Saudi Arabia, 2017.

Dr. Reem Alotaibi, Assistant Professor, PhD, Machine Learning, University of Bristol, UK, 2017.

Dr. Entisar Kayyal, Assistant Professor, Ph.D. in Distributed Systems, King Abdulaziz University, Saudi Arabia, 2018.

Course Catalog

CS Courses

CPCS-201 Introduction to Computer Science 3

The objective of this course is to provide an introduction to the computer science discipline. Topics include the representation and manipulation of data in computers, description of computer hardware components and how the work, and an overview of operating systems, algorithms, and programming languages.

CPCS-202 Programming (I) 3

The objective of this course is to cover the fundamental concepts of procedural programming. This course introduces the Java programming language and helps students develop basic problem-solving skills. Topics include algorithms, flowchart, API, IDE, and JDK, numerical data, primitive data type, short hand operators , cast value of one type to another type , selection statements, switch statements, break and continue statements, relational operators, logical operators, logical expressions, Boolean variable, Boolean expressions, repetition statements, nested loops, methods, pass arguments to a method, method overloading, method abstraction, use of methods in the math class, arrays, common array operations, methods with array arguments and return value, search and sort operations on array.

CPCS-203 Programming (II) 3

The objective of this course is to cover the basic and intermediate concepts of object oriented programming. Topics include the use of numerical data, primitive data types, selection statements, repetition statements, class, standard classes, object, instance of a class, object oriented programming, software development, constructor, methods, call by values, call by reference, UML, state memory diagram, class diagram, arrays, method overloading, constructor overloading, overriding, this, new, exception and assertions, Inheritance, encapsulation, data abstraction, private, public, protected, exception, inheritance, abstract class, polymorphism, file handling.

PREREQ: CPCS-202

CPCS-204 Data Structures (I) 3

The objective of this course is to provide students an understanding of abstract data structures, including, but not limited to, arrays, linked lists, queues, stacks, trees, and graphs. The course also aims to give a conceptual understanding of the trade-offs between various data structures, hence enabling students to choose an optimal data structure for a particular application. The students will also learn concepts of algorithmic design, recursion, and a variety of searching and sorting algorithms.

PREREQ: CPCS-203

CPCS-211 Digital Logic Design 3

This objective of this course is to provide an introduction to the fundamental concepts of digital logic design. Topics include number systems, binary codes, Boolean algebra, canonical and fundamental forms of Boolean functions, functions applications to digital circuits design, minimization of Boolean functions by Boolean algebra and Karnaugh maps, two -level and multi-level digital circuits, decoders, encoders, multiplexers, demultiplexers, latches, flip-flops, registers, counters, analysis and synthesis of synchronous sequential circuits. Additionally, this course includes a laboratory component in which students apply the design principles learned in lectures to the design of combinational circuits and synchronous sequential circuits.

PREREQ: CPIT-201

CPCS-212 Applied Math for Computing (I) 4

The objective of this course is to familiarize students with the basic concepts of applied mathematics used in computer science. Topics include: Matlab: matrices and arrays, Matlab: graphics, Matlab: programming, solution of nonlinear equations, solution of systems of linear equations, numerical integration, numerical differentiation, and ordinary differential equations.

PREREQ: MATH-202

CPCS-214 Computer Organization and Architecture (I) 3

The objective of this course is to explain how computers are designed and how they work. Students are introduced to modern computer principles using a typical processor. They learn how efficient memory systems are designed to work closely with the processor, and how input/output (I/O) systems bring the processor and memory together with a wide range of devices. The course emphasizes system-level issues and understanding program performance. Topics include instructions sets, assembly language, internal data representation, computer arithmetic, processor data path and control, memory hierarchy, I/O devices and interconnects, and an introduction to parallel processing.

PREREQ: CPCS-211

CPCS-222 Discrete Structures (I) 3

The objective of this course is to study the logical and algebraic relationships between discrete objects. This course cultivates clear thinking and creative problem solving by developing students' mathematical maturity in several core areas: logic and proofs, sets, functions, relations, and counting techniques.

CPCS-223 Analysis and Design of Algorithms 3

This is the first of a two-course sequence on computer-based algorithmic solution design and advanced data structures. It introduces fundamental algorithms for classic computing problems, the techniques used to construct them, their performance and applications. Topics include: formal definition and characterization of algorithms, recurrence relations, asymptotic notation and efficiency classes, iterative and recursive algorithm efficiency, empirical analysis of performance, advanced data structures such as balanced trees, and the design techniques: brute force, divide-conquer, decrease-conquer, problem transformation, and trading space for time.

PREREQ: CPCS-204

CPCS-241 Database (I) 3

This objective of this course is to introduce students to database management systems. Topics include Data, 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, The 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 (DDL and DML). *PREREQ: CPCS-204*

CPCS-301 Programming Languages 3

The objective of this course is to provide a comprehensive coverage of the fundamental concepts of programming languages by discussing the design issues of the various languages constructs, examining the design choices for these constructs in some of the most common languages, and critically comparing design alternatives. It discusses the formal methods of describing the syntax and semantics of programming languages. *PREREQ: CPCS-204, CPCS-222*

CPCS-302 Compiler Construction 3

The objective of this course is to acquaint students with the fundamentals of compilers and their construction. The course considers the principles that underlie compiler construction and focuses on the translation of programs written in conventional, higher level language into semantically equivalent programs written in assembly language. Students will learn how modern programming languages are implemented, how compilers interact with operating systems and machine architecture, and how to use compiler construction tools.

PREREQ: CPCS-301

CPCS-323 Summer (workplace) Training 0

This is mandatory, 200-hour internship program for all FCIT students. 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 groups, communications, and professional development experiences.

CPCS-324 Algorithms and Data Structures (II) 3

This is the second of a two-course sequence on algorithmic solution design and advanced data structures. The objective of this course is to study algorithms from a major application area, to illustrate advanced design techniques, and to introduce main concepts in computational complexity. The course should provide an opportunity to work with complex data structures and develop advanced programming skills. It should include significant discussion of applications and capstone project ideas. Topics include space and time trade-off techniques, limitations of algorithm power, and algorithms that illustrate advanced design methods such as dynamic programming, iterative improvement and greedy techniques. Suggested application areas include: graphs, operations research, computational geometry, bioinformatics, and cryptography.

PREREQ: CPCS-222, CPCS-223

CPCS-331 Artificial Intelligence (I) 3

The objective of this course is to provide a broad overview of AI and building intelligent systems. Topics include intelligent agents, problem-solving as a search activity, knowledge representation, planning, reasoning and learning. Students will also be introduced to evolutionary computation (EC), natural language processing (NLP), and programming in Prolog. *PREREQ: CPCS-204, CPCS-223*

CPCS-351 Software Engineering (I)   3

The objective of this course to introduce students to the basic concepts of software engineering as they relate to the development of medium to large scale software systems. Topics include the software life cycle, requirements development, object orientation, software architecture & design, and software testing. Students are expected to learn how to apply such principles to a real world problem. A term project of a medium-size is required.

PREREQ: CPCS-204

CPCS-353 Software Engineering Practice 3

The objective of this course is to further explore the design and thinking of object-oriented software engineering, from analysis through testing. Topics include practices of software project management, project estimation, distributed system architectures (client/ server), distributed object model, building client/server applications based-on Object-oriented technology, and Object-Oriented software engineering approach. The course will also teach students the principles and practices of software testing, validation, verification, maintenance, writing documentation, and evaluation of systems and tools.

PREREQ: CPCS-351

CPCS-361 Operating Systems (I) 3

The objective of this course is to provide a general overview of operating systems concepts and recent methodologies and techniques used in the field and their trades-offs, with various examples from the contemporary used systems. Topics include the basic structure of an operating system, its interaction with the hardware, software, and users, and the services it provides. The course illustrates different algorithms and techniques used in controlling, managing, and allocating various computer resources, such as CPU, memory, storage and I/O devices. It demonstrates the tuning of the operating system for maximizing the utilization and increasing the performance of the computer system. *PREREQ: CPCS-204, CPCS-214*

CPCS-371 Computer Networks (I) 3

The objective of this course is to provide an introduction to computer networks and the ISO-7 layers reference model, which includes necessary protocols. Selected network layers, such as data link layer, transport layer, network layer, etc., will be focused on with detailed information. In addition to this, network security, web technologies and application layer will also be introduced.

PREREQ: CPCS-214

CPCS-372 Computer Networks (II) 3

The objective of this course is to introduce students to the principles, design, implemen-

tation, and performance of computer networks. This course is based on the layering architecture and covers the routing protocols in detail. Topics include Internet routing protocols, local area networks, congestion control, TCP, wireless communications and networking, mobile IP, performance analysis, network address translation, multimedia over IP, switching and routing, peer-to-peer networking, network security, and other current research topics in the area of computer networks.

PREREQ: CPCS-371

CPCS-381 Human-Computer Interaction 2

The objective of this course is to familiarize students with the skills and concepts of Human-Computer Interaction (HCI), including the understanding of user needs, interface design and prototyping, and interface evaluation. Topics include an introduction to HCI, HCI goals, cognitive and perceptual issues, HCI design, data gathering, data analysis, task description, task analysis, interaction styles, interaction frameworks, prototyping, and evaluation.

PREREQ: CPCS-204

CPCS-391 Computer Graphics (I) 3

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, 2-D and 3-D modeling and transformations, viewing transformations, projections, rendering techniques, graphical software packages, and graphics systems. Students will use a standard computer graphics API to reinforce concepts and study fundamental computer graphics algorithms. *PREREQ: CPCS-204, CPCS-212*

CPCS-403 Internet Application Programming 3

The objective of this course is to provide a broad overview of Internet and Web technologies. Topics include HTML, XHTML, CSS, client-side scripting (JavaScript), server-side scripting (PHP), Web data-base connectivity, and XML Technologies. The students will be encouraged to design, implement, and evaluate small-scaled Web projects in groups/teams.

PREREQ: CPCS-324, CPCS-371

CPCS-404 Component-Based Computing 3

The objective of this course is to familiarize students with Component-Based Computing. Topics include component fundamentals, rationale of using component-based computing, and their standard criteria. The course also focuses on recent researches and techniques related to component-based computing. Moreover, it covers issues related to the component-based technology, the various tools of component-based computing, and the future of component-based computing.

PREREQ: CPCS-351

CPCS-405 Software Technology Topics 3

The objective of this course is to explore recent topics related to Software Technology. Topics include Object-Oriented Programming fundamental concepts, advanced swing graphical user interface, advanced exception Handling Techniques, Streams and Files, multithreading programming, and networking programming. Moreover, the course also focuses on database programming (JDBC), servlets and java server pages (JSP), and Java Security. *PREREQ: CPCS-351*

CPCS-413 Computer Architecture (II) 3

The objective of this course is to explore modern computer architecture approaches, such as designing advanced computer instructions, parallelism, and the advanced methods of data processing.

PREREQ: CPCS-214

CPCS-414 High Performance Computing 3

The objective of this course is to provide an in-depth overview of the current state of the art in high-performance computing. Additionally, the course provides more information about the architecture of high-performance computers.

PREREQ: CPCS-361

CPCS-424 Theory Of Computation 3

The objective of this course is to introduce students, with a background in Sciences, Engineering, or Mathematics, to some of the basic principles pertaining to the modeling

and analysis of computational problems and their solutions.

PREREQ: CPCS-212, CPCS-222

CPCS-425 Information Security 3

The objective of this course is to provide an introduction to information security in computer networks, with a focus on providing basic knowledge of the technical and operational issues of modern cryptosystems and their related standards. Topics include security threats and vulnerabilities, classical encryption techniques, block ciphers and stream ciphers, DES and triple DES, AES, Block cipher operation modes, asymmetric ciphers: RSA, Diffie-Hellman key exchange, hash functions, MAC functions, digital signature: digital Signature Standard DSS, key management and distribution, X.509 certificates, web security: SSL and TLS, email security (PGP), malicious software, and firewalls.
PREREQ: CPCS-361, CPCS-371

CPCS-432 Artificial Intelligence (II) 3

The objective of this course is to explore advanced topics concerning Artificial Intelligence and to cover programming language related to AI.

PREREQ: CPCS-331

CPCS-433 Artificial Intelligence Topics 3

The objective of this course is to explore recent topics related to Artificial Intelligence and the latest advances in this field.

PREREQ: CPCS-331

CPCS-442 Database (II) 3

The objective of this course is to explore advanced topics in databases, with a focus on distributed and parallel database management systems followed by database design and implementation. Topics include performance optimization, database security, transaction processing, data warehouses, and data mining.

PREREQ: CPCS-241

CPCS-454 Object-Oriented Analysis and Design 3

The objective of this course is to familiarize students with the fundamental foundations of Object-Oriented Approach in relation to systems and the advantages of this method. This course covers understanding various approaches and methodologies used in different phases of software development lifecycle, including requirements, analysis and specification, software design, software construction, software maintenance, and software process.

PREREQ: CPCS-351

CPCS-457 Software Engineering Theory 3

The objective of this course is to study the methods, values, attitudes, and techniques in software systems. It provides an understanding of the need for rigour and enables students to select and apply a relevant methodological approach to the development of well designed and documented systems.

PREREQ: CPCS-351

CPCS-462 Operating Systems (II) 3

The objective of this course is to familiarize students with the modern alternative operating models such as distributed processing, parallel processing, and real-time processing. Topics include virtual memory, thread scheduling, Security systems and their requirements, shared security systems, performance quality, system reliability, system failure, prefailure warning, and system recovery.

PREREQ: CPCS-361

CPCS-463 Computing Systems Security 3

The objective of this course is to introduce the fundamentals of Computer Security Systems and the potential risks and vulnerabilities in these therein. Topics include security management practices, access control systems and methodology, networks and Internet security, enterprise security architecture, operations security law, investigation, and ethics.

PREREQ: CPCS-361, CPCS-371

CPCS-464 Dependable Computing 3

The objective of this course is to acquaint students with the high-reliability computer systems used in fault intolerant critical applications. Topics include computing systems

security, applications that require high-quality computer systems, mobile client system, various security protocols, multi-distribution system, breach discovery and prevention, wireless networks reliability measurement, and ensuring the quality of service.

PREREQ: CPCS-463

CPCS-465 Performance and Modeling of Computing Systems 3

This objective of this course is to familiarize students with the fundamentals of performance and computer systems modeling, introducing students to computer systems and their components (hardware and software). This course also covers different methods of performance measurement, algorithms of software performance measurement, and computer performance measurement.

PREREQ: CPCS-324, CPCS-361

CPCS-466 Systems Programming 3

The objective of this course is to explore the design, development, and operation of system applications. Topics include the difference between system software and application software in terms of development features and area of application, file systems, permanent and temporary storage systems, assembly compiler, high-level languages, application setup, memory management system, and processes carried out under the operating systems. *PREREQ: CPCS-361*

CPCS-473 Computer Networks Practice 3

The objective of this course is to explore topics related to the practical aspects of networks, thereby familiarizing students with the various network components. The course provides an understanding of the network design and analysis as well as network architecture, including requirements validation and traceability. Students will be introduced to analyzing, developing, and validating requirements regarding the network architecture, in addition to network management principles and performance evaluation. *PREREQ: CPCS-371*

CPCS-474 TCP/IP and Web Networking 3

The objective of this course is to study the fundamentals of TCP/IP networks, technologies, and the Web. Topics include HTTP protocols, Web protocols, TCP/IP networks, Web services and standards.

PREREQ: CPCS-371

CPCS-482 Multimedia and User Interface Design 3

The objective of this course is to explore the fundamentals of multimedia and the use of multimedia in user interface design. The course is intended to give students both a theoretical understanding of, and practical experience with, designing multimedia products and the user interface design.

PREREQ: CPCS-381

CPCS-494 Special/Selected Topics 3

The objective of this course is to explore selected topics about the latest advancements in the field of Computer Science (topics determined by the Council of the Computer Science Department).

CPCS-498 Senior Project (I) 1

This course is the first part of a sequence of two courses that constitute the BSc graduation capstone project. In this part, the student is expected to propose, analyze, and design a software system or conduct a thorough investigation of a particular CS-related problem for research-based projects. The student will deliver oral presentations and written reports.

CPCS-499 Senior Project (II) 3

This course is the second part of a sequence of two courses that constitute the BSc graduation capstone project. In this project, the student will continue the System/Research development of the project that started in CPCS-498. The student will deliver oral presentations, progress reports, and a final report.

PREREQ: CPCS-498

IS Courses

CPIS-210 Computer Architecture and Organization 3

The objective of this course is to study the internal architecture/components of the computer, how they are integrated together, and the way they are controlled. This course should be preceded by an introduction in Logic and Digital Design. Topics include basic scientific concepts of how data networks function, data transferring techniques starting from hardware levels to high levels of data transferring protocols over intra-networks, and the scientific theories on which the modern digital communication technology is based.

PREREQ: CPCS-202

CPIS-220 Principles of Information Systems 3

The objective of this course is to provide students with an overall understanding of the main concepts of information systems and to highlight the importance of information systems in modern organizations and societies. Topics include information, data, and system concepts, information requirements in modern organizations and businesses (including decision making, operations, and other types of requirements), introducing different types of information systems, exploring the systems development life cycle (analysis, design, and implementation), methodologies of developing information systems, managing resources of information systems (data, hardware, software, etc.), knowledge management, quality and evaluation of information systems, ethical, social, and security issues of information systems

PREREQ: CPCS-202

CPIS-222 Principles of Operating Systems 3

The objective of this course is to present the basic concepts, modules and algorithms that work as intermediary programs between the user and the hardware, known as operating systems. It covers the basic concepts of recent operating systems, how they are designed and the way they work in terms of their efficiency and reliability. Also, it com-

pares the techniques used inside the operating systems in terms of their speed and use of space. Topics include an overview of operating systems, operating system principles, CPU scheduling and dispatch, concurrency, memory management, and virtual memory.

PREREQ: CPCS-204, CPIS-210

CPIS-240 Database Management Systems (I) 3

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, such as Oracle or MS SQL Server. The course introduces students to the concepts of databases and database modeling and design. It, in particular, provides students with a three-stage methodology for designing relational database applications, namely, conceptual, logical, and physical database modeling and design. In the first stage students will build a conceptual data model that is independent of all physical considerations. They will then transform this model in the second stage into the relational database logical model. In the third stage, students will translate the logical data model into a physical design for the target DBMS. Topics include basic concepts of databases, the 3-stage modeling and design methodology, the concepts of the relational database, conceptual data modeling using ERD, from ERD to RDB and reverse engineering, data normalization, SQL:DDL, SQL: manipulation and query languages, and relational algebra for querying.

PREREQ: CPCS-204

CPIS-250 Software Engineering 3

The objective of this course is to introduce the basic concepts and required skills for software engineering. It covers the basic concepts and skills required for developing large scale applications that take long periods of time. The course presents the latest methods and techniques used in software engineering obtained from the actual practice in the field as well as latest advances accomplished by specialist research centers. Also, it particularly emphasizes on the role of team work on developing software and the skills required to work as part of a team. Topics include

foundation for systems development, methodologies of IS development, software process models, process iteration, process activities, project management, project scope, project management life cycle, managing IS project, planning IS project, feasibility study of IS project, models of software development, determining system requirements (functional and non-functional requirements), data modeling and E-R-D model, object-oriented analysis and modeling, systems structure modeling, object, class, attributes, methods, classes relationships, generalization, specialization, association, class diagrams, object-oriented analysis and modeling.

PREREQ: CPCS-204

CPIS-312 Information and Computer Security 3

The objective of this course is to equip students with the scientific and mathematical concepts and skills related to information security. Topics include the security of information and software systems, including attacks and data encryption, mathematical foundations, algorithms of cryptography, ways of distributing keys, techniques of data protection over computer networks, and controlling access using passwords.

PREREQ: CPCS-370

CPIS-320 Decision Support Systems and Theory 3

The objective of this course is to study how Decision Support Systems (DSS) work and the theory behind different DSS techniques, thereby enabling them to understand today's turbulent business environment and how organizations survive and even excel in such environments (particularly solving problems and exploiting opportunities). This course provides the required skills and knowledge of the various decision-making models so that decisions can be based on logical and mathematical foundations under different circumstances, such as in cases of uncertainty, lack of information, or certainty. This course studies the design of computerized systems to support individual or organizational decisions. Moreover, the course aims at understanding the need for computerized support of managerial decision making and what was an early framework for managerial decision making.

PREREQ: CPIS-220, CPIS-250

CPIS-323 Summer (workplace) Training 0

This is mandatory, 200-hour internship program for all FCIT students. 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.

CPIS-330 Advanced Project and Quality Management 3

The objective of this course is to provide students with the necessary skills to plan, implement, control and finish large scale Information Systems projects, making sure of the quality of the projects during and after construction. It equips the students with the advanced requirements of sophisticated projects, the ability to identify the target users of such projects, and the ability to manage versatile projects. This course also covers the standard requirements of the Project Management Institute (PMI), as well as the requirements of (CMMI) Software Engineering Institute (SEI) with the help of one of the project management software packages.

PREREQ: CPIS-334, CPIS-357

CPIS-334 Introduction to Software Project Management 2

The objective of this course is to study the processes, methods, techniques, and tools that organizations use to manage their information systems projects. The course covers a systematic methodology for initiating, planning, executing, controlling, and closing projects. This course assumes that project management in the modern organization is a complex team based activity, where various types of technologies (including project management software as well as software to support group collaboration) are an inherent part of the project management process. This course also acknowledges that project management involves both the use of resources from within the firm, as well as contracted from outside the organization.

CPIS-340 Database Management Systems II 3

The objective of this course is to study advanced concepts in Database Managements Systems. It emphasizes on practical skills in designing, using, and optimizing performance of databases. It covers the fundamentals of object-oriented and distributed databases and their architectures. It aims to equip the students with the required techniques to optimize database performance and troubleshoot the concurrency problems of transactions.

PREREQ: CPIS-240

CPIS-342 Data Mining and Warehousing 3

The objective of this course is to study the basic concepts of data warehousing and the required skills to develop and use them. It emphasizes on employing data warehousing to support the decision-making process. It also covers the architectures of data warehousing and the infrastructural settings to develop them. It explains various ways of extracting, analyzing data to support the decision-making process. This course is intended to develop the student's ability to extract information from data and identify patterns and trends by designing a data warehouse and by applying data mining methods for classification, clustering, and association analysis.

PREREQ: CPIS-240

CPIS-350 Systems Design Patterns 3

The objective of this course is to study the principles of large-scale software architecture. It introduces the patterns, frameworks, and techniques for developing system based on components.

PREREQ: CPIS-250

CPIS-351 IS Analysis and Architecture Design 3

The objective of this course is to introduce methods used in IS analysis in order to identify and characterize needs and to automate and create computer systems for them. The automated systems incorporate several technologies, and this course studies the way making optimum use of such systems for the users' service. The course emphasizes on the design phase activities and also presents design using structural and object-oriented techniques. Topics include system architectures design, traditional approach to design, object-oriented approach to design for applications, designing files and database, designing the user interface, designing the system interface and prototyping, controls and security, implementation, and support issues.

PREREQ: CPIS-250

CPIS-352 IS Applications Design and Development 3

The objective of this course is to explore the design, selection, implementation, and management of enterprise IT solutions. The focus is on applications and infrastructure and their fit with the business. Topics include frameworks and strategies for infrastructure management, system administration, data/information architecture, content management, distributed computing, middleware, legacy system integration, system consolidation, software selection, total cost of ownership calculation, IT investment analysis, and emerging technologies. These topics are addressed both within and beyond the organization, with attention paid to managing risk and security within audit and compliance standards. Students also hone their ability to communicate technology architecture strategies concisely to a general business audience.

PREREQ: CPIS-351

CPIS-354 Principles of Human-Computer Interaction 3

The objective of this course is to provide an introduction to the field of human-computer interaction (HCI), an interdisciplinary field that integrates cognitive psychology, design, computer science and others. Examining the human factors associated with information systems provides the students with knowledge to understand what influences usability and acceptance of IS. Topics include the examination of human performance, components of technology, methods and techniques used in design and evaluation of IS, societal impacts of HCI, user-centered design methods, and the contemporary technologies used in empirical evaluation methods.

PREREQ: CPIS-250

CPIS-356 Software Metrics and Economics 3

The objective of this course is to study successful software development based on three factors: software technology, economic factors and human relations. This course also covers a variety of important concepts that influence the economics of software development, such as the procedures accompanying the software development process and cost accounting with an emphasis on the various measurement criteria of applications and their development process.

PREREQ: CPIS-250

CPIS-357 Software Quality and Testing 3

The objective of this course is to study the significance of quality during the process of developing software. Topics include the basic concepts of software quality assurance during all the stages of software development process and quality standard systems used in the field of software industry and Information Systems.

PREREQ: CPIS-250, CPIS-334

CPIS-358 Internet Applications and Web Programming 3

The objective of this course is to equip students with the necessary knowledge to design and implement Internet applications. Topics include the specific technologies of these applications, how to employ them in building effective and efficient applications, the technical characteristics of the Internet protocols, the various structures of Internet-based application development, and the organization and security of business transactions conducted over intranets.

PREREQ: CPIS-250

CPIS-360 Advanced Information Systems Technologies 3

The objective of this course is to study the basic concepts of using advanced technologies in building and developing recent Information Systems. Topics include object-oriented databases, distributed databases, data warehouses, and data mining techniques.

PREREQ: CPIS-240

CPIS-363 Intelligent Systems 3

The objective of this course is to equip students with the required skills to be able to access information and be able to use it efficiently through using intelligent systems that lead to success and economic superiority. This course will cover the necessary concepts and techniques that facilitate developing intelligent systems used in business applications.

PREREQ: CPIS-250

CPIS-370 Fundamentals of Data Networks 3

The objective of this course is to provide an introduction to IT infrastructure issues for students majoring in Information Systems. It covers topics related to both computer and systems architecture and communication networks, with an overall focus on the services and capabilities that IT infrastructure solutions enable in an organizational context. It gives the students the knowledge and skills that they need for communicating effectively with professionals whose special focus is on hardware and systems software technology and for designing organizational processes and software solutions that require in-depth understanding of the IT infrastructure capabilities and limitations. It also prepares the students for organizational roles that require interaction with external vendors of IT infrastructure components and solutions. The course focuses strongly on Internet-based solutions, computer and network security, business continuity, and the role of infrastructure in regulatory compliance.

PREREQ: CPCS-204, CPIS-210

CPIS-380 Introduction to E-Business Systems 3

The objective of this course is to study the marketing implications of the e-business systems. Topics include impact on information systems within a business, impact on business design and strategy, impact on the industries and markets, and business models for e-business.

PREREQ: CPIS-351, CPIS-358

CPIS-382 Development of E-Systems and Interface Design 3

The objective of this course is to introduce techniques that are useful stand-alone and can be integrated for building a semantic web. Topics include semantic web technologies, data modeling languages such as XML, XML SCHEMA, domain modeling languages such as RDF, RDF Schema, ontology modeling languages such as OWL, query languages such as XQuery and SPRQL. Also students will use tools such as Stylus studio and Protégé in their modeling.

PREREQ: CPIS-358

CPIS-420 Techniques of Decision Support Systems 3

The objective of this course is to extend the basic knowledge of DSS covered in the CPIS-230 by studying practical techniques and methods for DSS. Coupled with classical approaches, the course explores the latest techniques available for extracting suitable and relevant information to support making a wide range of decisions from day to day structured decisions, to complex unstructured decisions. In addition, the course also covers intelligent systems in particular relation to DSSs.

PREREQ: CPIS-320

CPIS-424 Modeling and Simulations 3

The objective of this course is to develop the student's ability to understand the basic concepts in modeling and simulation and develop discrete event simulation models. Topics include basic simulation modeling, simulation input and output analysis, validation and verification of simulation models, and building simulation models using Arena and MS Excel.

PREREQ: CPIS-250

CPIS-428 Professional Computing Issues 2

The objective of this course is to explore the ethical and social issues sparked by the ever-growing information society at the local and global level. Topics include the impact of digitized information on individuals and societies, privacy, intellectual property, computer crimes, evaluating and controlling technology, and professional ethics and responsibilities. The course also explores the social impact of information technology in different areas of human life such as Internet, information flooding, and the computerized world, business, medicine, law, government, transportation, entertainment, education, banking, e-commerce, communications, an overview of the law, ownership of software, software contracts and liability, privacy and the data protection act, computer misuse, and forensic, societies for computing professionals, and professionalism and ethics.

PREREQ: CPIS-323

CPIS-430 IS Change Management 3

The objective of this course is to equip students with practical procedures to develop and change Information Systems, providing them with scientific methods to create an organization under advanced IS management. Upon finishing this course, students are expected to be able to develop and restructure Information Systems in any department and understand the change management process.

PREREQ: CPIS-330

CPIS-434 IS Strategies and Policies 3

The objective of this course is to define the concept of the strategic framework that can be used to evaluate and make use of recent technologies to serve the overall goals of institutions. Topics include the main principles of strategic planning and the interrelation between them, the fundamental management strategies and how to make use of Information Systems, and how to develop short and long-term plans to obtain and manage technology.

PREREQ: CPIS-220

CPIS-444 Knowledge Management 3

The objective of this course is to provide the students with the fundamental concepts of Knowledge Management, equipping them with both scientific and theoretical background as well as the necessary practical skills. This course also covers the characteristics of and practical models used in Knowledge Management. It discusses the methods of collecting, classifying, and deploying knowledge to serve the overall goals of the organization.

PREREQ: CPIS-240

CPIS-461 Business Information Systems 3

The objective of this course is to equip students with the spirit of initiative in using technology to support business management and to employ technologies to support such spirit. It aims to make the students able to make use of technology as a source of support and strength for the organization. It seeks to meet business requirements by providing them with graduates who are proficient in Information Systems through a set of business applications. It discusses the role of Information Systems in the integration process between the different departments of the organization through homogeneous administrative operations.

PREREQ: CPIS-360

CPIS-462 Information Systems Applications 3

The objective of this course is to discuss advanced applications of Information Systems, as determined by the Council of the IS Department.

PREREQ: CPIS-461

CPIS-464 Distributed Systems   3

The objective of this course is to explore the concepts and theories of distributed systems. Topics include the characteristics and specifications of distributed systems, how to make use of them to serve operations and the organization in general, and the technical challenges faced in designing, developing, and protecting distributed systems.

PREREQ: CPIS-370

CPIS-465 Geographical Information Systems 3

The objective of this course is to explore the concepts and principles of Geographic Information Systems (GIS). Topics include identifying and evaluating the Geographic Information Systems, the distinction between the geographic and nongeographic environments, and a survey of the GIS programming tools and devices.

PREREQ: CPIS-220, CPIS-250

CPIS-466 Office Automation Systems 3

The objective of this course is to explore the concepts of office automation. It emphasizes on the planning techniques of office automation and the methods of implementing these plans, including selecting the appropriate technology, hardware, communication equipment, and training human resources. It also covers the administrative and technical concepts of the transformation process to office automation and the significance of the human impact during this process.

PREREQ: BUS-232, CPIS-351

CPIS-472 Data Networks Design and Management 3

The objective of this course is to explore the practical concepts and basic processes of designing and managing data networks. It addresses the technical and management aspects related to data networks design and use. It also equips the students with the technical skills required to compare and contrast between the various techniques related to data networking and the ability to develop selection criteria to choose from the available alternatives.

PREREQ: CPIS-370

CPIS-483 E-Systems Applications 3

The objective of this course is to provide broad understanding of various e-system Web applications and to identify the role these E-Systems play in the development process of institutions and the society. Topics/applications include social networks, e-Learning, e-government, mobile computing, pervasive computing, e-CRM, E-Auctions, E-Supply chain, and support technology concepts such Web 2.0 applications, web services, and cloud computing.

PREREQ: CPIS-380

CPIS-486 E-Business Strategies 3

The objective of this course is to explore e-business strategies for Information systems and the infrastructure required for web-based business models. Topics include E-Business and virtual organizations, characteristics of virtual organizations, e-business models, globalization on SME e-business, strategy evaluation to change e-business,

virtual infrastructure, culture to contact external bodies and participate in e-business, developing strategies for virtual organizations, IS plans and strategies of e-business, and converting to e-business strategies of e-markets.

PREREQ: CPIS-380

CPIS-490 Selected Topics in IS   3

The objective of this course is to explore selected topics concerning the latest advancements in the field of Information Systems (topics determined by the Council of the Information Systems Department).

CPIS-498 Senior Project (I) 1

This course is the first part of a sequence of two courses that constitute the graduation capstone project. In this part, the student is expected to propose, analyze, and design a software system or conduct a thorough investigation of a particular IS-related problem for research-based projects. The student will deliver oral presentations and written reports.

CPIS-499 Senior Project (II) 3

This course is the second part of a sequence of two courses that constitute the graduation capstone project. In this project, the student will continue the System/Research development of the project that started in CPIS-498. The student will deliver oral presentations, progress reports, and a final report.

PREREQ: CPIS-498

IT Courses

CPIT-100 Computer Skills 3

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

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

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

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

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

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

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

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

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

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

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

The objective of this course is to study the hardware and software principles of interac-

tive 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

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

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

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

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

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

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

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

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

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

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

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

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-340

CPIT-436 E-Business Technology 3

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

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

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

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

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

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

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

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

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

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

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

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.

PREREQ: CPIT-498