King Saud University
College of Computer Science & Information
Department of Information Technology

Bachelor of Science in Information Technology Program Guide

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1 Program History

The last revision of the current program was done in 2005 when the "Computer Applications (CA)" major was changed to "Information Technology (IT)". At that time, it was proposed that the second phase of the program change should include tracks or concentrations within the program. After observing the strengths and weaknesses of the current program over the past years, the faculty members and administration saw it was necessary to adjust the program to finally include tracks and to make room for practical training in the program.

It has been apparent during the past decade that Information Technology will play an increased role in the lives of people, in business, law, science, arts, and health. Indeed, the need for Information technology is apparent in the 2030 Saudi Vison [1] which focuses on increasing the investments in, and lead, the digital economy. In addition, it recognizes the fact that a sophisticated digital infrastructure is integral to today's advanced industrial activities. There will be continued need within Saudi Arabia for people with software development skills and for people with specialized knowledge in leading edge technologies. Public and private sectors will be drivers of domestic demand for Information Technology graduates.

As businesses, government agencies, and other organizations are continuously shaped by new technologies that minimize the gap between man and machine; this requires professionals with skills in artificial intelligence, data science, internet of things, networks, robots and cybersecurity.

Our program fosters diversification through offering a wider selection of courses that are tuned to the market requirements and provides the necessary specialization by offering a set of new concentrations (tracks). We believe this will render our graduates more relevant to the market.

2 Strength of the IT Program

The program follows closely the guidelines of the Association of Computing Machinery – the governing body that influences computer science education around the world – as defined in its 2017 publication "Curriculum Guidelines for Baccalaureate Degree Programs in Information Technology" [2]. This in turn will enable graduates to achieve the student outcomes mentioned in the ABET CAC accreditation criteria and will ensure that our renewed program meets both the general and the IT specific curriculum criteria.

The BS in Information Technology program is accredited by the Computing Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and the Information Technology Program Criteria.

The image of the program is built around the following key strengths:

- A sound program in information technology with focus on areas beyond programming or immersive software development.
- The potential to conduct projects, internships, and research with faculty having broad professional experience.

Moreover, from a curricular point of view, the program is designed to possess the following strengths:

- A core that focuses on courses that enhance the learning outcomes.
- Practical training to enhance the practical experience of the students.
- Satisfy accreditation requirements on both national and international levels.
- Adaptability to changes in job market needs as the new program provides in-depth knowledge through specific concentrations that provide fixable courses contents which facilitates adapting to the changes in market needs and the new technological advances.

3 Degrees Offered

The program offers multiple concentrations (tracks) thereby allowing students to gain their degree in any of the following:

1. Bachelor of Science in Information Technology – Data Science and Artificial Intelligence Track (DSAI)
2. Bachelor of Science in Information Technology – Cyber Security Track (CYS)
3. Bachelor of Science in Information Technology – Networks & IoT Engineering Track (NIE)

4 Duration and Structure of Program

The program is a 4-year program. It requires at least 127 credit hours distributed as follows:

- University Requirements: 8 credit hours.
- College Requirements: 46 credit hours.
- Department Requirements: 73 credit hours.

5 Graduation requirements:

The Information Technology Curriculum is composed of 127 credit hours. Students will graduate after succeeding in all courses with, at the end, a minimum cumulative GPA of 2.75 or above.

6 Language of Instruction

The courses of the program are taught in English.

7 Vision, Mission, and Objectives

During the development of this program, a clear vision was kept in mind. Moreover, the department is committed to fulfilling the mission and objectives stated below, which will lead to the realization of the following vision.

7.1 Vision

Excellence in Information Technology education and research, and **commitment** to effective fulfillment of the IT needs in our society.

7.2 Mission

To provide high quality education in information technology through the combination of theory, practice, and applications to make students competitive in computing workplaces, excellent in applications development, and innovative in research to serve the society.

7.3 Program Educational Objectives

The program educational objectives (PEOs) of the IT program graduates are:

- ✓ **PEO #1:** To Practice effectively as IT professionals by leading, designing, developing and/or maintaining projects in various IT areas.
- ✓ **PEO #2**: Pursued higher studies and conducted research in the computing field.
- ✓ **PEO #3**: Been ethically and socially responsible and communicated effectively with their peers, as members of multidisciplinary teams or as leaders.
- ✓ **PEO #4:** Engaged in lifelong learning and professional development.

8 Market

One key pillar of the Saudi Vision 2030 [1] is developing the country's digital infrastructure and capabilities. This includes investing in new technologies like artificial intelligence, and the Internet of Things, as well as supporting the development of a thriving startup ecosystem. In order for the country to achieve its ambitious goals, a strong and secure digital infrastructure is essential, which is achieved through investing in robust cyber security measures.

Artificial intelligence is an area where Saudi Arabia is making significant investments. The Saudi Data and Artificial Intelligence Authority (SDAIA) was established in 2019 with the aim of harnessing the power of data and AI to fuel economic growth. In addition, the Saudi Company for Artificial Intelligence (SCAI) aims to use AI to drive economic growth and create new opportunities for businesses and citizens. The Saudi AI market size is expected to show a growth rate (CAGR) of 17.97% between 2023-2030 [3].

The ability to connect "things" to the Internet has accompanied the revolution in business, which comes hand-in-hand with the Saudi Vision 2030. Companies such as Ericsson and STC joint efforts aspires to accelerate Saudi's transformation to a completely connected society, utilizing 5G's vast potential. This entails assisting the digital transformation of sectors through 5G and IoT, enabling the development of innovative business models to help businesses in Saudi Arabia to succeed in the future. Saudi IoT market is expected to show a growth rate (CAGR) of 17.6% between 2023-2027 [4].

The Saudi government has identified cyber security as a strategic priority. Thus, the National Cybersecurity Authority (NCA) was established in 2017 as part of Saudi Arabia's National Cyber Security Strategy. Since its foundation, the NCA has set out to establish the minimum standards of cyber security for national and government agencies at risk of

cyberattack within the country. Saudi's cyber security market is projected to grow at a CAGR of 12.4% between 2020 and 2026 [5].
Given this vast development in the fields of AI, IOT and Cyber Security and their prominent importance in the country's strategic plan, it is clear that preparing future specialists in these fields is essential. Therefore, creating a program with concentrations in these three fields will help students to close the gaps needed to meet such demands and eventually contribute to reaching the Saudi 2030 Vison.

8.1 Job Prospects for Graduates

The program provides a broad coverage of the Information Technology field as well as concentrations that will enable graduates to fill such positions as:

1. Solutions Developer
2. Software Quality Assurance/Test Engineer
3. Project Manager
4. Academic
5. Database Administrator
6. Information Technology Supervisor
7. Cyber Security Analyst/Engineer
8. Data Modeler/Designer
9. Data Analyst/Scientist
10. Network Engineer
11. Smart Home/City Designer/ Developer
12. Web Frontend/Backend Developer
13. Machine Learning Developer/Engineer

8.2 Adherence to ABET objectives for IT programs

In 2017, the ACM along with IEEE-CS revised the IT2008 to produce IT2017 which emphasis that learning outcomes express the importance of competence (what students can do) over knowledge (what students know. The mission of the IT2017: *"Having just knowledge is not sufficient to be productive in the changing information technology world. IT competencies require skills and dispositions that complement knowledge to achieve professional expectations of a modern workplace."*[2] These guidelines were followed in the development of this program, thereby ensuring ABET standards are met.

8.3 Adherence to NCAAA objectives for IT programs

A National Qualifications Framework (NQF) has been established for accreditation and quality assurance in the Kingdom of Saudi Arabia to ensure the quality of higher education. As stated in the NCAAA guidelines: *"The framework describes the expected increasing levels of knowledge and skill in these areas for each qualification."*[6].
These guidelines were followed in the development of this program, thereby ensuring EEC-HEC accreditation standards are met.

9 Curriculum

The following set of concentration tracks within the Bachelor of Science major in Information Technology is offered:

1. Bachelor of Science in Information Technology – Data Science and Artificial Intelligence Track (DSAI)
2. Bachelor of Science in Information Technology – Cyber Security Track (CYS)
3. Bachelor of Science in Information Technology – Network and IoT Engineering Track (NIE)

It is envisioned that new tracks emerge in the future that may extend or replace the current tracks.

The concentrations are structured in a manner that meets the following general objectives. In the first five semesters, all BS-IT students will experience a streamlined introduction to information technology with an emphasis on conceptual, theoretical, and programming aspects. The intent of this common foundation is to provide a solid basis for all BS-IT majors and the ultimate pursuit of the specialty majors. The mathematical and science requirements are kept consistent with what is expected for information technology majors.

Students have the opportunity to start focusing on a specific concentration of their choice after their 5th semester. During the third and fourth years, the program is structured to emphasize the choice and exploration of a concentration in depth.

Students must pursue practical training (in industry) to join an IT firm in the summer semester, on a full-time basis for at least 8 weeks.

9.1 Common Learning Outcomes

The IT program learning outcomes expected of students are grouped into three domains as follows:

9.1.1 Knowledge

Graduates will be able to:

- Describe knowledge of fundamentals of IT, standards, best practices and their applications

9.1.2 Skills:

Graduates will be able to:

- Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals (IT).

9.1.3 Value

Graduates will be able to:

- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

9.2 Courses

As illustrated in Table 1 the program requires the completion of 127 credit hours, which are distributed among 111 credit hours of required courses and 16 credit hours of elective courses.

Table 1: Distribution of credits in the department study plan

Requirements	Type	Credit Hours
University Requirements	Compulsory	4
	Electives	4
College Requirements	Compulsory from common 1st year	32
	Compulsory from departments	14
Department Requirements	Core IT	49
	Core Science	3
	Core Math	9
	Track Electives	12
	Program Requirements	**127**

9.2.1 Common Courses

All students are required to complete 115 credit hours apart from the track concentration courses. Those credits include university requirements, college requirements, and department requirements. They are shown in Tables 2 -5.

Table 2: University Requirements

Course Number	Course Name	Credit Hours		Pre(Co)
IC 107	Professional Ethics	2	(2+0+0)	
IC 108	Current Issues	2	(2+0+0)	
IC xxx	IC Elective #1	2	(2+0+0)	
IC xxx	IC Elective #2	2	(2+0+0)	
	University Requirements	**8**		

Table 3: IC Electives

Course Number	Course Name	Credit Hours		Pre(Co)
IC 100	Studies in the Prophet Biography	2	(2+0+0)	
IC 101	Principles of Islamic Culture	2	(2+0+0)	
IC 102	Family in Islam	2	(2+0+0)	
IC 103	Economic System in Islam	2	(2+0+0)	
IC 104	Islamic Political System	2	(2+0+0)	
IC 105	Human Rights	2	(2+0+0)	
IC 106	Medical Jurisprudence	2	(2+0+0)	
IC 109	Developmental Role of Woman	2	(2+0+0)	

Table 4: College Requirements

Course Number	Course Name	Credit Hours		Pre(Co)
ENGS 100	English	6		
STAT 101	An Introduction to Probability & Statistics	3		
CHEM 101	General Chemistry I	4		
ENT 101	Entrepreneurship	1		
ARAB 100	Writing Skills	2		
ENGS 110	English	6		ENGS 100
MATH 101	Differential Calculus	3		
CT 101	IT Skills	3		
EPH 101	Fitness and Health Education	1		
CI 101	University Skills	3		
CSC111	Computer Programming I	4	(3-2-1)	CT 101
CSC113	Computer Programming II	4	(3-2-1)	CSC111
CSC 212	Data Structures	3	(3-0-1)	CSC 113
CSC 227	Operating Systems	3	(3-0-1)	CSC 212
	College Requirements	**46**		

Table 5: Department Requirements

Course Number	Course Name	Credit Hours	Pre(Co)	
Math 106	Integral Calculus	3	(3-0-2)	Math 101
Math 151	Discrete Mathematics	3	(3-0-2)	Math 101
Math 244	Linear Algebra	3	(3-0-2)	Math 106

	Core Math	**9**		
IT 219	Physics for IT	3	(2-2-0)	
	Core Science	**3**		
IT 210	Information Technology Fundamentals	3	(2-2-0)	
IT 223	Computer Organization & Architecture	3	(3-0-2)	Math 151 + IT219
IT 214	User Experience Design	3	(2-2-0)	CSC111
IT 222	Database Principles	3	(2-2-1)	IT210
IT 324	Information Security	3	(3-0-2)	Co (IT 328)
IT 312	Web Applications Engineering	3	(2-2-0)	CSC 111
IT 328	Network Principles	4	(3-2-0)	IT 219
IT 320	Practical Software Engineering	4	(3-2-1)	IT 214+Co(329)
IT 326	Data Mining	3	(2-2-0)	(CSC 212)
IT 329	Advanced Web Technologies	3	(2-2-0)	IT328 + IT 312
IT 426	Fundamentals of Artificial Intelligence Systems	3	(3-0-2)	CSC212 + Math 244
IT 423	Introduction to Project Management	3	(2-2-0)	IT 320
IT 427	IT Entrepreneurship & Innovation	3	(3-0-0)	IT 320
IT 479	Practical Training	2	(2-0-0)	completing 90 credit hours
IT 496	Project -1	3	(3-0-0)	IT320, CSC212 + completing 90 credit hours
IT 497	Project -2	3	(3-0-0)	IT 496
	Core IT	**49**		
	Department Requirements	**61**		

9.2.2 IT Tracks

There are 12 credit hours that depend on the student's selection of concentration (track). As illustrated in Table 6, two of the courses from the concentration track are mandatory concentration cores; the remaining two courses could be any elective from the chosen track. The courses for each concentration and the electives are given in Table 7.

Table 6: Distribution of Concentration Courses

Course	Credit Hours	Possible Choices
Concentration Core # 1	3	Required for chosen track
Concentration Core # 2	3	Required for chosen track
Concentration Elective	3	Any elective from chosen track
Concentration Elective	3	Any elective from chosen track
	12	

Table 7: Department Tracks Electives

Course Number	Course Name	Track	Credit Hours		Pre(Co)
IT 362	Principles of Data Science **(Concentration Core # 1)**	Data Science and Artificial Intelligence (DSAI)	3	(3+0+2)	CSC212
IT 461	Practical Machine Learning **(Concentration Core # 2)**		3	(2+2+0)	IT 326
IT 462	Big Data Systems			(2+2+0)	IT 326
IT 465	Data Analytics & Visualization		3	(2+2+0)	IT362
IT 466	Selected Topics in Data Science and Artificial Intelligence		3	(3+0+1)	IT 362
IT 467	Advanced Artificial Intelligence		3	(2+2+0)	IT426-IT461
IT 468	Applied Computer Vision		3	(2+2+0)	IT 461
IT 469	Human Language Technologies		3	(2+2+0)	IT 461
IT 371	Application Security **(Concentration Core # 1)**	Cyber Security (CYS)	3	(2+2+0)	IT 324 - Co(IT329)
IT 471	Cyber Security Governance **(Concentration Core # 2)**		3	(3+0+1)	IT 324
IT 472	Cybercrime and Digital forensics		3	(2+2+0)	IT 371
IT 473	System Security		3	(2+2+0)	IT 371
IT 474	Network Security		3	(2+2+0)	IT 324
IT 475	Information Assurance Compliance and Audit		3	(3+0+1)	IT 471
IT 476	Selected Topics in Cyber Security		3	(3+0+1)	IT 371

IT 381	Wireless & Mobile Computing **(Concentration Core # 1)**	**Networks & IOT Engineering (NIE)**	3	(2+2+1)	IT 328
IT 481	Introduction to IoT **(Concentration Core # 2)**		3	(3+0+2)	IT 328
IT 482	Sensor and Ad hoc Networks		3	(2+2+0)	IT381
IT 483	IoT Services & Applications		3	(2+2+0)	IT481, IT312
IT 484	Cloud Computing		3	(2+2+0)	IT328
IT 485	Robotics fundamentals		3	(2+2+0)	
IT 486	Selected Topics in Networks &IoT		3	(3+0+1)	IT481

9.2.3 Practical Training

Students who have successfully completed 90 credits of the program must take up practical training. The practical training comprises 2 credit hours that are earned after completing 8 weeks of a full-time work experience usually during the summer semester. The training may be paid or unpaid.

Students benefit from this option in the following ways:

- Develop professional skills and gain transferable, relevant work experience.
- Develop maturity, leadership, and clarity regarding their career direction.
- Improve employment prospects at graduation.
- Establish relationships with potential employers.
- May receive a higher starting salary at graduation than graduates who have not had training.

9.2.4 Graduation Project

The BSIT program offers 2 Capstone courses, IT 496 (Project 1) and IT 497 (Project 2). These courses cover the two parts of a graduation project following Agile approach:

- IT 496 (Project 1) is the first of a two-course sequence (IT496 and IT 497) in which the students will develop a complete software system using agile methodologies (an incremental approach). At the end of the course, each team should present a demo of the software system developed (release-1).
- IT 497 (Project 2) is the second of a two-course sequence (IT496 and IT 497). The teams, with the guidance of their supervisor will continue the design and development of new increments for the second release of the software system (Relese-2).

Students are divided into groups of 3 to 5 members. Seminars are given during the semester to support students in their projects. Furthermore, students meet with their supervisor weekly who guides them and assesses their progress. The Department also provides students with a Help-Desk that comprises faculty members with various backgrounds to provide specialized support for students.
Table 8 presents full details of the four year plan described previously in this manual.

9.3 Four Year Plan

Table 8: The 4-year study plan

Level	ONE			
Course Number	Course Name	Credit Hours		Pre(Co)
ENGS 100	English	6		
MATH 101	Differential Calculus	3		
CHEM 101	General Chemistry	4		
ARAB 100	Writing Skills	2		
ENT 101	Entrepreneurship	1		
		16		

Level	TWO			
Course Number	Course Name	Credit Hours		Pre(Co)
ENGS 110	English	6		ENGS 100
STAT101	Introduction to Statistics	3		
CT 101	IT Skills	3		
EPH 101	Fitness and Health education	1		
CI 101	University Skills	3		
		16		

Level	THREE			
Course Number	Course Name	Credit Hours		Pre(Co)
CSC 111	Computer Programming 1	4	(3+2+1)	CT 101
IT 219	Physics for IT	3	(2-2-0)	
Math 151	Discrete Mathematics	3	(3+0+2)	Math 101
IT 210	Information Technology Fundamentals	3	(2+2+0)	
IC 107	Professional Ethics	2	(2+0+0)	
		15		

Level	FOUR			
Course Number	Course Name	Credit Hours		Pre(Co)
CSC 113	Computer Programming 2	4	(3+2+1)	CSC 111
IT 223	Computer Organization & Architecture	3	(3+0+2)	Math151, IT219
IT 222	Database Principles	3	(2+2+1)	IT 210
IT 214	User Experience Design	3	(2+2+0)	CSC111
Math 106	Integral Calculus	3	(3+0+2)	Math 101
IC 108	Current Issues	2	(2+0+0)	
		18		

Level	FIVE			
Course Number	Course Name	Credit Hours		Pre(Co)
CSC 212	Data Structures	3	(3+0+1)	CSC 113
IT 324	Information Security	3	(3+0+2)	(IT328)
IT 312	Web Applications Engineering	3	(2+2+0)	CSC111
IT 326	Data Mining	3	(2+2+0)	(CSC212)
IT 328	Network Principles	4	(3+2+0)	IT219
IC xxx	IC Elective #1	2	(2+0+0)	
		18		

Level	SIX			
Course Number	Course Name	Credit Hours		Pre(Co)
Math 244	Linear Algebra	3	(3+0+2)	Math 106
CSC 227	Operating Systems	3	(3+0+1)	CSC 212
IT 320	Practical Software Engineering	4	(3+2+1)	IT 214(IT 329)
IT 329	Advanced Web Technologies	3	(2+2+0)	IT312, IT328
IT xxx	Concentration core #1	3		
IC xxx	IC Elective #2	2	(2+0+0)	
		18		

Level	SEVEN			
Course Number	Course Name	Credit Hours		Pre(Co)
IT 426	Fundamentals of Artificial Intelligence Systems	3	(3+0+2)	CSC212, Math244
IT 423	Introduction to Project Management	3	(2+2+0)	IT 320
IT 496	Project -1	3	(3+0+0)	IT320,CSC212 + completing 90 credit hours
IT xxx	Concentration core #2	3		
IT 479	Practical Training	2		completing 90 credit hours
		14		

Level	EIGHT			
Course Number	Course Name	Credit Hours		Pre(Co)
IT xxx	Concentration (Elective)	3		
IT 427	IT Entrepreneurship & Innovation	3	(3+0+0)	IT320
IT 497	Project -2	3	(3+0+0)	IT496
IT xxx	Concentration (Elective)	3		
		12		

Total Credit Hours = 127

10 Admission and Registration

10.1 Admission

- Students applying to the CCIS are centrally admitted by the Deanship of Admission and Registration of the university to the Engineering/Science branch of the Preparatory Year (PY). The minimum requirements for students' admission to the preparatory year are based on the following criteria:
    - The total number of accepted students should not exceed the number specified by the University Council
    - Students are ranked and selected based on their composite average of the following:
        - 30% of General Aptitude Test
        - 30% of Secondary School GPA
        - 40% of Subject Attainment Test
- After completing the PY, students are admitted to the college and distributed to the various departments according to three criteria: their preference, GPA from the PY, and the capacity of each department.
- The requirement for the admission of students to the CCIS is based on a composite score as follows:
    - 40% of General Aptitude Test
    - 10% of Subject Achievement Test
    - 7 × PY GPA
    - Math 101 points

10.2 Registration

- Students are registered automatically through electronic portal following a model plan of study set by the department. This plan includes all prerequisites, maximum and minimum allowable number of credit hours per semester.
- The system allows the student to make changes (add and drop courses) within the preset rules during the first week of classes. Afterwards, only course withdrawals are allowed provided they are done two weeks before the final examination period.

11 Study Regulations and Tests

Rules and regulation for the information technology department follow the list of studies and tests for the undergraduate stage and its executive rules at King Saud University.

11.1 Study Regulations

- The minimum academic load for a student in a semester is twelve academic units and the maximum is twenty academic units in proportion to the student's cumulative GPA academic plan. The Deanship of Admission and Registration Affairs may increase the maximum load of the student per semester provided that it does not exceed twenty-four academic units.
- Students are not allowed to take the final exam if their attendance percentage is less than 50%.
- Students may withdraw from continuing to study a semester provided that they submit a withdrawal request at least two weeks before the start of the final exams. The number of times of withdrawal should not exceed three times throughout the student's stay at the university and it is not permissible to withdraw from three consecutive semesters.
- Students may withdraw from continuing to study one or more courses for which they will be credited a grading (W) without being considered a failure provided that they drop a maximum of two courses per semester and submit the application two weeks before the beginning of the final examination period.
- Students may submit a request to postpone study through the electronic portal before the end of the first week of the semester, provided that the postponement period does not exceed two consecutive semesters or maximum of three non-consecutive semesters.
- If a student interrupts his/her study for one academic semester without applying for postponement, he/she will be dropped from the university records. The student can apply for a re-enrollment through the electronic portal within the four semesters following his/her record drop.
- The student will be dismissed from the university if he/she received three consecutive warnings because his/her cumulative average was lower than the average specified for graduation or if he/she does not complete the graduation requirements within a maximum period of half the period specified for his/her graduation, in addition to program duration.
- Courses studied by a student at another university may be equated provided that the course passed by the student is equivalent to the KSU course.
- A student may be exempted from studying a course or group of courses provided that it does not exceed 25% of the total study units of the study plan, and the student is given an exempt grade (E).

11.2 Tests Regulations

- The semester work and final exam for the course are evaluated according to what is stated in the approved course description.
- The course teacher is committed to announce how grades for semester work will be distributed to students at the beginning of each semester. He/she is obligated to show the students their answer sheets for the semester exam after announcing its results and he/she

is also obliged to announce the results of the completed semester work before the end of the period specified for withdrawal.

- The student has the right to object to his/his grade in the semester test within a week of announcing the results.
- The student may submit a request for a makeup exam within a period not exceeding one week from the date of the exam in cases of extreme necessity.

11.3 Final Exam Regulations

- The student shall not attend more than two examinations within the same day.
- The student is not allowed to attend the examination half an hour after the examination session begins. He/she is also not allowed to leave the examination hall before a minimum of half an hour from the initial start of the examination.
- Cheating or violating the rules and regulations of the final examination are violations that entail disciplinary action based upon the disciplinary system issued by the university council.
- The student may appeal the final grade for the course within a period not exceeding ten days from the date of announcing the result, the application must be submitted to the department that teaches the course.

11.4 Grades Calculations

The grades are calculated as shown in the table below.

Table 9: Grades calculation

Points	Grade	Course Grade	Mark
5.00	A+	Excellent Plus	95-100
4.75	A	Excellent	90 less than 95
4.50	B+	Very Good Plus	85 less than 80
4.00	B	Very Good	80 less than 85
3.50	C+	Good Plus	75 less than 80
3.00	C	Good	70 less than 75
2.50	D+	Pass Plus	65 less than 70
2.00	D	Pass	60 less than 65
1.00	F	Fail	Less than 60

12 Guidance and Counselling Services

12.1 Enrolment Advising

The Academic Advising Committee (AAC) is responsible for overseeing the academic advising process in the departments at the beginning of each academic semester. The AAC allocates groups of students to each faculty member, i.e. academic advisor, who is responsible for all aspects of the students academic progress.

12.2 University-level Counselling Services

KSU Student Counseling Center (KSUSCC) supports student counseling at the university level. It aims to provide student counseling services that could not be provided at the college level, and to coordinate with colleges to oversee the implementation of college-level counseling programs.

12.3 Academic and Professional Counseling

Academic advisors, assigned by the Academic Advising Committee (ACC), are responsible for providing educational counseling for students and evaluating the student's plan of study to ensure it will satisfy the college and university requirements while it meets each student's specific needs. AAC also provides several channels to keep in touch with students through social media, i.e. AAC blog and AAC twitter account, to share with students: schedules, advisor list … etc.

12.4 Psychological and Social Counseling

CCIS has an on-site psychologist and an on-site social worker at the female campus who provides psychological counseling for students and track their cases.

13 Rights and Duties

13.1 Student Academic Rights

- Student right to be provided by the adequate educational environment by ensuring all the educational facilities to support this aim.
- Student right to receive education related to the university curriculums that are studied in accordance to the university regulations and rules that control the academic function.
- Student right to get the college and departments study plan, as well as the educational schedules before they begin to study.
- Student right to drop or add any curriculums or even withdraw from a whole semester in accordance with the study and registration rules within the limited period that is announced to the students.
- Student right to abide the faculty members by the lectures timing, and fulfilling both scientific and practical credit hours, not canceling lectures or changing its time, except when it is necessary.
- Student right to ask and participate in an adequate scientific discussion with faculty members, without any supervision or penalty unless the discussion goes too far beyond the general moral and the appropriate manners and etiquette, both during lectures and during the office hours allocated to meet students.

- Student right to have exam questions within the curriculum components and within the discussed matters, the tests should ensure the fair evaluation for the abilities of the students.
- Student right to attend all tests unless there is a valid reason, and the student has to be informed about his/her deprivations from attending exams in enough time.
- Student right to know the typical answers for the semester exams questions and the marks distribution before the final exam.
- Student right to revise his answers to the final exam according to the university regulations and rules that manage the system of revision and its terms.
- Student right to know the results of his/her semester or final exams after evaluating and approving them.

13.2 Student Academic Obligations

- Student obligation to study and undertake all the students' requirements in light of the rules set by the university and timings for the beginning and ending the study, transfer, registration, and withdrawal.
- Student obligation to respect the teaching staff members, employees, workers, from the university employees and others from the contracting companies and not to expose them to any form of harm.
- Student obligation to respect the rules and arrangement related to the lectures and refrain from being absent from lectures except only with an accepted excuse.
- Student obligation to prepare the researches and other requirements for the courses without cheating or sharing with others.
- Student obligation to attend exams, not attempt to cheat, assist to commit cheating with any form, or entering any forbidden materials or appliances to the examination halls.
- Student obligation to obey instructions delivered to them by the responsible personnels or observers in the examination halls.

14 Complaints and Grievances

KSU is keen to protect the rights of the university's students, by enacting legal definitions lists and executive rules for various rights, with a body for reconciliation and grievances represented in the Student Rights Protection Unit. The Student Rights Protection Unit aims to enlighten the students about their academic and non- academic rights that are presented by the university, the manner of practicing these rights and the body that is concerned with it. In addition, it aims to inform the students about the process of raising complaints.

A complaint must be submitted by the student to the sub-committee that he/she belongs to within thirty days after the incident. The sub-committee makes a decision and forward the complaint to the permanent committee. The permanent committee issues a recommendation to preserve the case or present it to the Dean of Student Affairs who presents it to the university president to approve the final decision.

References

[1] https://www.vision2030.gov.sa/ar

[2] Curriculum Guidelines for Baccalaureate Degree Programs in Information Technology. ACM IT2017

[3] Artificial Intelligence - Saudi Arabia, accessed 06 Oct 2023, <https://www.statista.com/outlook/tmo/artificial-intelligence/saudi-arabia>

[4] Saudi Arabia Internet of Things (IoT) Market, accessed 06 Oct 2023, <https://www.researchandmarkets.com/reports/5562151/saudi-arabia-internet-of-things-iot-market-by>

[5] Saudi Arabia Cyber Security Market, accessed 06 Oct 2023, <https://www.6wresearch.com/industry-report/saudi-arabia-cyber-security-market-2020-26>

[6] National Qualifications Framework for Higher Education in the Kingdom of Saudi Arabia, 2020.

Appendix A - Common Foundation Courses

Course Code: CSC 111	رقم المقرر و رمزه: ١١١ عال
Course Name: Computer Programming 1	اسم المقرر: برمجة حاسبات ١
Credits (lecture +lab +tutorial): 4 (3+2+1)	*Pre-requisites:* CT 101
Level: 3	*Co-requisites:*
Course Description: Introduction to computers and programs. Programmer's algorithm, byte code and Java Virtual Machine. Java program's structure, constants, variables and built-in data types. The arithmetic, assignment, increment and decrement operators. Classes and object definition, UML representation of a class, declaration of objects (Instance variables), primitive types and reference types. Relational and logical operators, Boolean expressions, conditional statements, loop statements. Object oriented principles, encapsulation and information hiding, methods and the message passing principles, setters, and getters. Methods in depth, passing parameters, constructors, setters. Arrays, usefulness of arrays, declaration of arrays, access to array elements, operations on arrays.	
Text Books: 1. Java: An Introduction to Problem Solving and Programming,7ed, W. Savitch, Pearson International.	
Approved by the College Council in its 10th meeting on 26/1/1431H	
Head of Department	Dean of College

Course Code: CSC 113	رقم المقرر و رمزه: عال **113**
Course Name: Computer Programming 2	اسم المقرر: **2-** برمجة الحاسبات
Credits (lecture +lab +tutorial): 4 (3+2+1)	*Pre-requisites:* CSC 111
Level: 4	*Co-requisites:*

Course Description:
This course continues the coverage of the fundamental concepts of Object-Oriented Programming started in Programming I (CSC 111). It covers more advanced concepts and topics such as relationships between classes, inheritance, polymorphism, abstract classes, error handling, interfaces, generics and data structures.

Text Books:

1. An Introduction To Object-Oriented Programming With JAVA, Latest Edition, C. Thomas WU, McGraw-Hill Higher Education, ISBN 0-07-111680-X

2. Java Programming: From Problem Analysis to Program Design,4th Edition by D.S. Malik.

Approved by the College Council in its 10th meeting on 26/1/1431H

Head of Department Dean of College

Course Code: CSC 212	رقم المقرر و رمزه: عال **212**
Course Name: Data Structures	اسم المقرر: هياكل البيانات
Credits (lecture +lab +tutorial): 3 (3+0+1)	*Pre-requisites:* CSC 113
Level: 5	*Co-requisites:*
Course Description: Fundamental concepts of data structures. Performance measurement of algorithms. Implementation and use of lists, stacks, queues, priority queues, trees, heaps, hash tables and graphs. Recursion. Students will do programming assignments.	
Text Books: 1. Data Structures and Algorithms in Java, 6th edition, by M.T. Goodrich and R. Tamassia. John Wiley and Sons, Inc.ISBN: 1118771338.	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: CSC 227	رقم المقرر و رمزه: عال **227**
Course Name: Operating Systems	اسم المقرر: نظم التشغيل
Credits (lecture +lab +tutorial): 3 (3+0+1)	*Pre-requisites:* CSC 212
Level: 6	*Co-requisites:*
Course Description: This is an introductory course in Operating Systems. As such, it is intended to cover many of the concepts related to most of the actual Operating Systems. Although the study of a particular Operating System is out of the scope of this course, nevertheless, we will cover most of the concepts found in any existing Operating System. We will review computer system and operating system structures, processes and threads (concepts of, communication, synchronization and deadlocks), CPU Scheduling, memory management and virtual memory.	
Text Books: 1. Operating Systems Concepts, 9th Edition by Abraham Silberschatz et al, John Willey & Sons, 2013.	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: IT 210	رقم المقرر و رمزه: ٢١٠تم
Course Name: Information Technology Fundamentals	اسم المقرر: المبادئ الأساسية لتقنية المعلومات
Credits (lecture +lab +tutorial): 3 (2-2-0)	*Pre-requisites:*
Level: 3	*Co-requisites:*
Course Description: This course provides an introduction to the fundamental principles of information technology and its pillars. It introduces students to the discipline of IT and its applications in industry. Topics include: techniques used in problem solving, solution representation, and ethical issues regarding legal, privacy and intellectual property rights concerns and their application to information technology.	
Text Books: 1. Michael J. Quinn; Ethics for the Information Age; Addison-Wesley; latest edition	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: IT 214	رقم المقرر و رمزه: ٢١٤تم
Course Name: User Experience Design	اسم المقرر: تصميم تجربة المستخدم
Credits (lecture +lab +tutorial): 3 (2-2-0)	*Pre-requisites:* CSC111
Level: 4	*Co-requisites:*

Course Description:

This course provides an introduction to the field of Human-Computer Interaction (HCI) and an overview of software architectures used in modern interfaces. The course will describe and apply theoretical concepts for analyzing observed problems in interfaces, models and frameworks from the field. The interaction design process, rules and principles that support the usability will be described and applied theoretically and in practice via interaction prototypes. A variety of user interface evaluation techniques (e.g. GOMS. heuristic evaluation, User-Centered Design and contextual design techniques) in the field of HCI will be covered and applied according to usability and accessibility standards. The course will also cover principles of universal design.

Text Books:

1. Alan Dix, Janet Finlay; Human-Computer Interaction; Prentice Hall; latest edition
2. Bill Buxton, *Sketching the User Experiences*, latest Edition

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 219	رقم المقرر و رمزه: ٢١٩تم
Course Name: Physics for IT	اسم المقرر: الفيزياء لتقنية المعلومات
Credits (lecture +lab +tutorial): 3 (2-2-0)	*Pre-requisites:*
Level: 3	*Co-requisites:*

Course Description:

This course aims at covering the fundamental principles behind computer and network technologies. It is divided into three main sections. The first section focuses on electronics and digital circuits, semiconductors and the use of transistors and Integrated circuits in building digital circuits, digital electronics and the binary system. The second section focuses on electromagnetic waves, the different types of signals, frequency spectrum, signal propagation and amplification, analogue/digital conversion and modulation techniques. The third section covers force, motors and magnetic fields, conversion of mechanical/electrical energy, and motion principles.

Text Books:

1. Garcia, Narciso, Damask, Arthur, Schwarz, Steven; Physics for Computer Science Students - With Emphasis on Atomic and Semiconductor Physics; Springer-Verlag New York Inc; latest edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 222	رقم المقرر و رمزه: ٢٢٢ تم
Course Name: Database Principles	اسم المقرر: مبادئ قواعد البيانات
Credits (lecture +lab +tutorial): 3 (2+2+1)	*Pre-requisites:* IT210
Level: 4	*Co-requisites:*

Course Description:
Characteristics of the database approach. Database concepts and architecture; Data models, schemas and instances; Program data independence, Database languages and interfaces. Data models for database systems; The E-R DM, Relational DM and Relational Algebra. Relational model constraints; Domain, key, and integrity constraints. SQL-relational DB language; Data definition, queries, update statements, and views in SQL. Database design; functional dependencies, Normal forms. Introduction to OO databases.

Text Books:

1. T. Connolly and C. Begg; Database Systems: A practical approach to design implementation and management; Latest Edition; Addison Wesley.

Approved by the College Council in its 10th meeting on 26/1/1431H

Head of Department Dean of College

Course Code: IT 223	رقم المقرر و رمزه: ٢٢٣تم
Course Name: Computer Organization & Architecture	اسم المقرر: تنظيم وعمارة الحاسبات
Credits (lecture +lab +tutorial): 3 (3-0-2)	*Pre-requisites:* Math 151 + IT219
Level: 4	*Co-requisites:*

Course Description:

This course introduces students to computer organization and architecture. Topics include: data representation, digital logic, fundamental building blocks (logic gates, flip-flops, decoders, encoder, multiplexer, arithmetic functions, counters, registers), register transfer notation, memory, bus and CPU (datapath and control unit) design.

Text Books:

- Logic and Computer Design Fundamentals, By M. Morris Mano, Charles R. Kime and Tom Martin, Prentice Hall, last edition.
- Ytha Yu, Charels Marut "Assembly Language Programming and Organization of the IBM PC", Last edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 312	رقم المقرر و رمزه: ٣١٢تم
Course Name: Web Applications Engineering	اسم المقرر: هندسة تطبيقات الويب
Credits (lecture +lab +tutorial): 3 (2-2-0)	*Pre-requisites:* CSC 111
Level: 5	*Co-requisites:*

Course Description:

This course introduces students to the wide field of Web Programming with emphasis on its use to build real world web applications. Students will be trained to get a basic and solid understanding of various fundamental topics of front-end web programming including web design principles, and client-side scripting. It also introduces the latest technologies in front-end web development frameworks and responsive web design. On completion of this course, students should relate what they have learned to what impact the web is making to society.

Text Books:

- Learning Web Design. Jennifer Robbins, O'Reilly Media; latest edition

Approved by the College Council in its 5th meeting on 22/3/1442H

Head of Department Dean of College

Course Code: IT 320	رقم المقرر و رمزه: ٣٢٠تم
Course Name: Practical Software Engineering	اسم المقرر: هندسة البرمجيات العملية
Credits (lecture +lab +tutorial): 4 (3-2-1)	*Pre-requisites:* *IT 214*
Level: 6	*Co-requisites:* *IT 329*

Course Description:

This course covers the fundamentals of software engineering, including software process models, understanding system requirements, effective methods of design using object-oriented design methodology, architectural design, and interface design. The course will also introduce students to different approaches to software development, system integration, system validation and verification techniques, software evolution process, software maintenance, managing the code, documentation, configuration management, and software quality management including software measurements and metrics. The course will combine a strong technical focus with a capstone project providing the opportunity to practice software engineering knowledge, skills, and practices.

Text Books:

1. Roger Pressman, Bruce Maxim; Software Engineering A Practitioner's Approach, latest edition; McGraw-Hill.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 324	رقم المقرر و رمزه: ٣٢٤ تم
Course Name: Information Security	اسم المقرر: أمن المعلومات
Credits (lecture +lab +tutorial): 3 (3-0-2)	*Pre-requisites:*
Level: 5	*Co-requisites:* IT 328

Course Description:

This course defines information security. Topics include security services and its mechanisms, such as confidentiality, integrity, availability and non-repudiation, security policies, access control models, authentication methods, types of attacks (including social engineering, man in the middle, DoS…etc), malware, security principles (such as separation of duties, need to know…etc), basic principles of hashing, symmetric & asymmetric cryptography, digital certificates &PKI , Email security through S/MIME & PGP, Web Security, overview of firewalls and Intrusion detection system, Operating System security, physical security, risk assessment, incidence response, disaster recovery, business continuity and a general look into computer forensics.

Text Books:

1. Security + Guide to NETWORK SECURITY Fundamentals, Mark Ciampa, Thomson Course Technology, latest edition.
2. Introduction to CRYPTOGRAPHY and NETWORK SECURITY, Behrouz A.Forouzan, McGraw-Hill International Edition, latest edition.

Approved by the College Council in its 10th meeting on 26/1/1431H

Head of Department Dean of College

Course Code: IT 326	رقم المقرر و رمزه: ٣٢٦تم
Course Name: Data Mining	اسم المقرر: تنقيب البيانات
Credits (lecture +lab +tutorial): 3 (2-2-0)	*Pre-requisites:*
Level: 5	*Co-requisites:* CSC212

Course Description:

This course is an introductory course on data mining. It introduces the basic concepts and the fundamental principles of data mining with a focus on two major data mining functions: pattern discovery and cluster analysis. It also introduces the methods, implementation techniques, and applications of data mining.

Text Books:

1. Jiawei Han, Micheline Kamber, and Jian Pei; Data Mining: Concepts and Techniques; Morgan Kaufmann; latest edition

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 328	رقم المقرر و رمزه: ٣٢٨تم
Course Name: Network Principles	اسم المقرر: مبادئ شبكات الحاسب
Credits (lecture +lab +tutorial): 4 (3-2-0)	*Pre-requisites:* IT 219
Level: 5	*Co-requisites:*

Course Description:

This course provides an introduction to computer networks, including the Internet. It covers basic concepts and theory of computer networks and describes network technologies, architectures, protocols and standards in the different layers of the TCP/IP Internet suite of protocols. It introduces the basics of the physical layer and describes the architecture and design of local area networks including Ethernets. Topics include, but are not limited to, routing, addressing, process communication, reliability and network performance. The course provides theoretical background and hands on experience.

Text Books:

1. James Kurose, Keith Ross; Computer Networking: A Top-Down Approach Featuring the Internet; Addison Wesley; latest edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 329	رقم المقرر و رمزه: ٣٢٩تم
Course Name: Advanced Web Technologies	اسم المقرر: تقنيات الويب المتقدمة
Credits (lecture +lab +tutorial): 3 (2-2-0)	*Pre-requisites:* IT 328+ IT 312
Level: 6	*Co-requisites:*

Course Description:

This course extends students' web development capabilities by focusing on back-end web technologies and enhancing students' knowledge in advanced and emerging web development concepts. The course covers asynchronous client-server communication, server-side development and explores methodologies for web-based information exchange (i.e. Web services and web application programming interfaces APIs). Throughout the course, emphasis is placed on exposure to up-and-coming technologies relating to the web, providing hands-on experience, and discussion of practical implications of such emerging technologies.

Text Books:

1. Fundamentals of Web Development, Global Edition, by Randy Connolly and Ricardo Hoar. Latest edition.

Approved by the College Council in its 12th meeting on 22/6/1441H

Head of Department Dean of College

Course Code: IT 423	رقم المقرر و رمزه: ٤٢٣تم
Course Name: Introduction to Project Management	اسم المقرر: مقدمة في ادارة المشاريع
Credits (lecture +lab +tutorial): 3 (2-2-0)	*Pre-requisites:* IT 320
Level: 7	*Co-requisites:*

Course Description:

This course introduces students to the concepts and methodologies of Project Management (PM). Students will learn and apply basic project management concepts including planning, scheduling, work breakdown structures and project control, quality and risk management approaches and strategies, various cost estimation paradigms including estimation by analogy and algorithmic cost estimation techniques.

Text Books:

1. A Guide to the Project Management Body of Knowledge: (Pmbok Guide); Project Management Institute; latest edition.
2. Information Technology Project Management; Kathy Schwalbe ; latest edition ; Cengage Learning.

Approved by the College Council in its 12th meeting on 22/6/1441H

Head of Department Dean of College

Course Code: IT 426	رقم المقرر و رمزه: ٤٢٦تم
Course Name: Artificial Intelligence Systems	اسم المقرر: أنظمة الذكاء الاصطناعي
Credits (lecture +lab +tutorial): 3 (3+0+2)	*Pre-requisites:* CSC212 + Math 244
Level: 7	*Co-requisites:*

Course Description:

This course introduces students to the wide field of Artificial Intelligence (AI) with emphasis on its use to solve real world problems. Students will be trained to get a basic and solid understanding of various fundamental topics of Artificial Intelligence including searching, knowledge representation and reasoning, rule-based systems and machine learning. This course is also an opportunity for students to discover AI based technologies. It should review how AI techniques have been incorporated by companies to enhance traditional business applications. An exposure to Python or another AI language would be beneficial for students. On completion of this module, students should relate what they have learned to what impact AI is making to society.

Text Books:

1. S. Russell, P. Norvig, Artificial Intelligence: A Modern Approach, Latest Edition, Prentice –Hall.

Approved by the College Council in its 15th meeting on 22/3/1433H

Head of Department Dean of College

Course Code: IT 427	رقم المقرر و رمزه: ٤٢٧تم
Course Name: IT Entrepreneurship & Innovation	اسم المقرر: ريادة الأعمال والإبداع في تقنية المعلومات
Credits (lecture +lab +tutorial): 3 (3-0-0)	*Pre-requisites:* IT 320
Level: 8	*Co-requisites:*

Course Description:

This course will focus on teaching the basics of Innovation & Entrepreneurship in Information Technology, market analysis and customer engagement as well as open innovation. It will also tackle the creation of startups and managing their growth.

Text Books:

1. Yevgeniy Brikman; Hello, Startup: A Programmer's Guide to Building Products, Technologies, and Teams; O'Reilly Media, Inc.; latest edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 479	رقم المقرر و رمزه: ٤٧٩تم
Course Name: Practical Training	اسم المقرر: تدريب عملي
Credits (lecture +lab +tutorial): 2 (2-0-0)	*Pre-requisites:* completing at least 90 credit hours
Level: 7	*Co-requisites:*

Course Description:

Students join a company or an IT center in a government or private sector on a full-time basis for at least 8 weeks in the last summer prior to their graduation. It may be for a longer time if taken on part-time basis. The aim of the practical training is to gain experience by applying knowledge and skills they acquire in the program in real-life and in team working. The training is evaluated by the training supervisor at the Organization and comprehensive reports are sent to the IT department.

Text Books:
Not applicable

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 496	رقم المقرر و رمزه: ٤٩٦ تم
Course Name: Project 1	اسم المقرر: المشروع -١-
Credits (lecture +lab +tutorial): 3 (3-0-0)	*Pre-requisites:* IT320, CSC212 + completing at least 90 credit hours
Level: 7	*Co-requisites:*

Course Description:

This course is the first of a two-course sequence (IT496 and IT 497) in which the students will develop a complete software system using agile methodologies (an incremental approach). Students will work in teams; with an assigned supervisor to guide them through the software development process. Each team must select and identify a real-world problem, define the problem domain, elicit user and system requirements, analyze current solutions, and finally design and implement the first release of the system. Teams should demonstrate the ability to use new tools and programming languages. The graduation project committee provides support seminars for the students during the course. At the end of the course, each team should present a demo of the software system developed (release-1), discussing important design and development decisions. They should also submit a formal report documenting the system design and development. Team work, leadership, communication and writing skills are all important ingredients for a successful project.

Text Books:

Not applicable.

Approved by the College Council in its 10th meeting on 26/1/1431H

Head of Department | Dean of College

Course Code: IT 497	رقم المقرر و رمزه: ٤٩٧ تم
Course Name: Project 2	اسم المقرر: المشروع -٢-
Credits (lecture +lab +tutorial): 3 (3-0-0)	*Pre-requisites:* IT 496
Level: 8	*Co-requisites:*

Course Description:

This course is the second of a two-course sequence (IT496 and IT 497). The teams, with the guidance of their supervisor will continue the design and development of new increments for the second release of the software system (Relese-2). Teams should demonstrate the ability to use new tools and programming languages. The graduation project committee provides support seminars for the students during the course.

At the end of the course, each team should present a demo of the final software system, discussing important design and development decisions. They should also submit a final report, which documents the complete system design and development, as well as required admin guides and user manuals. Team work, leadership, communication and writing skills are all important ingredients for a successful project.

Text Books:

Not applicable

Approved by the College Council in its 10th meeting on 26/1/1431H

Head of Department Dean of College

Appendix B - Data Science and Artificial Intelligence(DS)

Course Code: IT 362	رقم المقرر و رمزه: 362 تم
Course Name: Principles of Data Science	اسم المقرر: أساسيات علم البيانات
Credits (lecture +lab +tutorial): 3 (3+0+2)	*Pre-requisites:* CSC212
Level: 6	*Co-requisites:*
Course Description: This course introduces students to the basics of Data Science, an essential emerging subject in the Information Technology field. It builds the foundation for other data management courses. It introduces the whole data science cycle from data collection, to exploratory data analysis, predictive and descriptive modeling, data interpretation and communication. Students will have exposure to hands-on state of the art tools.	
Text Books: 1. Rachel Schutt and Cathy O'Neil, Doing Data Science, O'Reilly Media, latest edition.	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: IT 461	رقم المقرر و رمزه: ٤٦١ تم
Course Name: Practical Machine Learning	اسم المقرر: تعلم الآلة التطبيقي
Credits (lecture +lab +tutorial): *3 (2+2+0)*	*Pre-requisites:* IT 326
Level: *7*	*Co-requisites:*
Course Description: This course introduces students to the basic concepts, techniques, and algorithms in Machine Learning (ML), with more emphasis on practical applications using real problems and data sets. It covers different types of learning algorithms, such as supervised and unsupervised learning. Students will learn how to analyze models' performance using different techniques and tackle some common performance problems such as over- and under- fitting.	
Text Books: • Practical Machine Learning, Sunila Gollapudi, O'Reilly Media; latest edition.	
Approved by the College Council in its 16th meeting on 9/9/1443H	
Head of Department	Dean of College

Course Code: IT 462	رقم المقرر و رمزه: ٤٦٢ تم
Course Name: Big Data Systems	اسم المقرر: أنظمة البيانات الضخمة
Credits (lecture +lab +tutorial): *3 (2+2+0)*	*Pre-requisites:* IT 326
Level: *8*	*Co-requisites:*

Course Description:
This course introduces key concepts and state-of-the-art big data systems. Main topics to be covered include but not limited to: fundamentals of data storage systems, big data platforms, cluster computing and distributed file systems of intensive data.

Text Books:

1. Big Data 2.0 Processing Systems: A Systems Overview, latest edition
2. Data Mining: Practical Machine Learning Tools and Techniques Learning Spark. Publisher: Language: English. ISBN-10: 1449358624. ISBN-13: 978-1449358624; O'Reilly Media; latest edition.

Approved by the College Council in its 12th meeting on 20/6/1443H

Head of Department Dean of College

Course Code: IT 465	رقم المقرر و رمزه: ٤٦٥تم
Course Name: Data Analytics & Visualization.	اسم المقرر: تحليل البيانات وتمثيلها
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT362
Level: 8	*Co-requisites:*
Course Description: This course introduces the main principles in data analytic and visualization. It provides students with statistical and quantitative analysis, extensive use of data, exploratory and predictive models, business intelligence (BI), and information visualization. During the course, students will practice design, develop, analyze and visualize different types of data using most recent tools based on data type**.**	
Text Books: Brett Lantz et.al. "R: Data Analysis and Visualization" Packet Publishing Limited, latest edition.	
Approved by the College Council in its 12th meeting on 22/6/1441H	
Head of Department	Dean of College

Course Code: IT 466	رقم المقرر و رمزه: ٤٦٦تم
Course Name: Selected Topics in Data Science and Artificial Intelligence	اسم المقرر: مواضيع مختارة في علم البيانات
Credits (lecture +lab +tutorial): 3 (3+0+1)	*Pre-requisites:* IT 362
Level: 8	*Co-requisites:*
Course Description: The course provides insight into selected state of the art relevant topics within data science and artificial intelligence. Students will be introduced to the most recently practical experience with data analysis and optimization, and industry related algorithms and technologies.	
Text Books: No textbook required	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: IT 467	رقم المقرر و رمزه: ٤٦٧تم
Course Name: Advanced Artificial Intelligence	اسم المقرر:
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT426, IT461
Level: 8	*Co-requisites:*
Course Description: In this course students will be exposed to advanced topics in Artificial Intelligence. Also, an introduction to robots and their applications will be also covered including real world case studies from business and industry. The course also covers the ethical issues related to AI.	
Text Books: Stuart Russell and peter Norving. Artificial Intelligence: A Modern Approach. Pearson latest edition.	
Approved by the College Council in its 9th meeting on 9/3/1441H	
Head of Department	Dean of College

Course Code: IT 468	رقم المقرر و رمزه: **468**تم
Course Name: Applied Computer Vision	اسم المقرر: الرؤية الحاسوبية التطبيقية
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT 461
Level: 8	*Co-requisites:*
Course Description: This course will introduce a number of fundamental concepts in computer vision and expose students to a number of real-world applications. The students will gain hands-on experience by applying cutting-edge computer vision algorithms.	
Text Books: David A. Forsyth and Jean Ponce. Computer vision: A modern Approach. Pearson, latest edition.	
Approved by the College Council in its 9th meeting on 9/3/1441H	
Head of Department	Dean of College

Course Code: IT 469	رقم المقرر و رمزه: 469 تم
Course Name: Human Language Technologies	اسم المقرر: تقنيات اللغات البشرية
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT 461
Level: 8	*Co-requisites:*

Course Description:

In this course, students will be exposed to methods for processing human language speech/text and the underlying computational properties of natural languages. Students will explore natural language knowledge at different levels including phonetics, morphology, syntax, semantics, pragmatics and discourse levels. The course also introduces students to the evaluation techniques in the field of human language technologies. In addition to building applications to process written and/or spoken language.

Text Books:

Daniel Jurafsky and James H. Martin. "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition." (Latest Edition).

Approved by the College Council in its 9th meeting on 9/3/1441H

Head of Department Dean of College

Appendix C - Cyber Security (CYS)

Course Code: IT 371	رقم المقرر و رمزه: ٣٧١تم
Course Name: Application Security	اسم المقرر: أمن التطبيقات
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT 324
Level: 6	*Co-requisites:* IT 329
Course Description: This course introduces students to the application engineering and design processes and how to integrate and apply cyber security tools and techniques in these processes. Topics include the methodology of secure application design, development and testing; application security best practices, methodologies and techniques; analysis of application-based attacks and defenses; and .Net security frameworks.	
Text Books: 1. Web Application Security: A Beginner's Guide, By Bryan Sullivan and Vincent Liu. McGraw Hill Education, latest edition. 2. Threat Modeling : designing for security, by Adam Shostack.	
Approved by the College Council in its 9th meeting on 25/4/1441H	
Head of Department	Dean of College

Course Code: IT 471	رقم المقرر و رمزه: ٤٧١تم
Course Name: Cyber Security Governance	اسم المقرر: إدارة الأمن الإلكتروني
Credits (lecture +lab +tutorial): 3 (3+0+1)	*Pre-requisites:* IT 324
Level: 7	*Co-requisites:*
Course Description: This course covers issues concerning management of risks, which both digital information and network assets in an organization are exposed to, and provides information and guidelines that can help with the establishment of a framework to assure that information security strategies are aligned with the objectives of the business and are consistent with legal and regulatory obligations. Topics include existing risk management frameworks, models, processes and tools to equip students with the theory, science and practical knowledge to deal appropriately with risk in an enterprise.	
Text Books: Michael E. Whitman and Herbert J. Mattoro, Management of Information Security, Course Technology, latest Edition.	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: IT 472	رقم المقرر و رمزه: ٤٧٢تم
Course Name: Cybercrime and Digital forensics	اسم المقرر: الجريمة الإلكترونية والعلوم الجنائية الرقمية
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT 371
Level: 8	*Co-requisites:*

Course Description:

This course covers fundamentals of digital forensics, cybercrime scene analysis and electronic discovery. Digital forensics uses tools and techniques to collect and preserve evidence of computer crimes. Digital forensics focuses on the reconstruction of events that have led to the system corruption, with the goals of recovering critical data, aiding authorities in tracking those who may have caused the security breach, and learning techniques used by hackers to improve the protection of systems and prevent similar breaches in the future. Topics include file systems and storage analysis, data hiding techniques, network forensics; projects involving using, understanding, and designing digital forensic tools; anti-forensics; legal issues and standards.

Text Books:

1. B. Nelson, A. Philips, C. Steuart; Guide to Computer Forensics and Investigations; Course Technology, latest edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department | Dean of College

Course Code: IT 473	رقم المقرر و رمزه: ٤٧٣تم
Course Name: System Security	اسم المقرر: أمن الانظمة
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT 371
Level: 8	*Co-requisites:*

Course Description:

Course topics are related to securing and hardening different operating systems, virtual machine infrastructures, access control, and assuring security of systems.

Text Books:

1. Operating System Security, by Trent Jaeger. Morgan & Claypool. Latest edition
2. The Mobile Application Hacker's Handbook, by Dominic Chill et.al. WILEY.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 474	رقم المقرر و رمزه: ٤٧٤ تم
Course Name: Network Security	اسم المقرر: أمن الشبكات
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT 324
Level: 8	*Co-requisites:*

Course Description:

The course covers theory and practice of network security giving detailed study of identification and authentication methods, authentication and key exchange protocols such as: Diffie-Hellman key agreement. The course also provides the students with a closer look into security protocols at different network layers such as SSL/TLS, SSH, IPSec and https. Also, it covers security in email servers, proxy servers, wireless and mobile, security in network components, using network defenses and designing secure networks. Through the use of lecture, and hands-on tutorials and labs, the key components of Network Security will be discussed and demonstrated.

Text Books:

1. Network Security Essentials: Applications and Standards, by William Stallings, Prentice Hall, latest edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department | Dean of College

Course Code: IT 475	رقم المقرر و رمزه: ٤٧٥تم
Course Name: Information Assurance Compliance and Audit	اسم المقرر: التدقيق والمراجعة المعلوماتية
Credits (lecture +lab +tutorial): 3 (3+0+1)	*Pre-requisites:* IT 471
Level: 8	*Co-requisites:*
Course Description: This course covers the principles, approaches and methodologies in auditing information systems to ensure the processes and procedures are in compliance with relevant laws and regulatory provisions especially in the context of information systems security. The aim of the course is to build an understanding of the process for conducting IT audit of information systems and related controls to meet business objectives.	
Text Books: Chris Davis, Mike Schiller, Kevin Wheeler; IT Auditing Using Controls to Protect Information Assets; McGraw-Hill Education; last edition.	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: IT 476	رقم المقرر و رمزه: ٤٧٦ تم
Course Name: Selected Topics in Cyber Security	اسم المقرر: موضوعات مختارة في أمن المعلومات
Credits (lecture +lab +tutorial): 3 (3+0+1)	*Pre-requisites:* IT 371
Level: 8	*Co-requisites:*
Course Description: This course covers new emerging Cyber Security methodologies, frameworks, technologies, research, … etc.	
Text Books: No textbook required.	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Appendix D - Networks & IOT Engineering (NIE)

Course Code: IT 381	رقم المقرر و رمزه: ٣٨١تم
Course Name: Wireless & Mobile Computing	اسم المقرر: الحوسبة اللاسلكية و الجوالة
Credits (lecture +lab +tutorial): 3 (2+2+1)	*Pre-requisites:* IT 328
Level: 6	*Co-requisites:*
Course Description: This course will examine the area of mobile and wireless networking, looking at the unique network protocol challenges and opportunities presented by wireless communication and host or router mobility. Although, this course will touch on some of the important physical layer properties of radio and infrared communications, it will focus on network protocols above the physical layer, with an emphasis on the media access control, network, and transport protocol layers.	
Text Books: 1. J. Schiller, Mobile Communication, Latest Edition, Pearson Education Limited.	
Approved by the College Council in its 10th meeting on 26/1/1439H	
Head of Department	Dean of College

Course Code: IT 481	رقم المقرر و رمزه: ٤٨١تم
Course Name: Introduction to IoT	اسم المقرر: مقدمة في إنترنت الأشياء
Credits (lecture +lab +tutorial): 3 (3+0+2)	*Pre-requisites:* IT 328
Level: 7	*Co-requisites:*
Course Description: The course provides an overview of key Internet of Things (IoT) concepts and explores its potential. It introduces IoT architectures, applications, standards and regulations. It describes the typical components of IoT device, and the different IoT design considerations, constrains and challenges. It presents technologies relevant to the design and development of IoT including object identification, localization, sensing & actuation, data and security. It also explores the IoT effect on society and businesses, and describes the trends for the future.	
Text Books: 1. A. Bahga, V. Madisetti; Internet of Things (A Hands-on-Approach); VPT, latest edition.	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Course Code: IT 482	رقم المقرر و رمزه: ٤٨٢تم
Course Name: Sensor and Ad hoc Networks	اسم المقرر: أجهزة الاستشعار والشبكات المخصصة
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT381
Level: 8	*Co-requisites:*

Course Description:

This course provides an introduction to ad hoc and sensor networks and describes the fundamentals behind their design and their role in ubiquitous and pervasive computing. It explains Wireless Sensor Networks (WSNs) architecture, sensor node hardware and operating systems, protocols, and applications. It covers several issues and challenges like data aggregation, information dissemination, power management, localization, coverage and self-organization. A primary focus of this course is to give students hands-on programming experience with various sensors and sensing platforms.

Text Books:

1. W. Dargie and C. Poellabauer; Fundamentals of Wireless Sensor Networks: Theory and Practice; Wiley Series on Wireless Communication and Mobile Computing; last edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 483	رقم المقرر و رمزه: ٤٨٣تم
Course Name: IoT Services & Applications	اسم المقرر: خدمات وتطبيقات إنترنت الأشياء
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT481, IT312
Level: *8*	*Co-requisites:*

Course Description:

This course introduces development technologies, standards and applications for the Internet of Things (IoT). It also introduces the Web of Things and describes how to design and implement scalable, flexible, and open IoT solutions using web services and technologies. It describes the Web of Things layered architecture and introduces several protocols. Moreover, it examines various WoT applications such as smart homes, smart buildings, smart cities, smart health and smart education and discusses IoT smart concepts like smart sustainability, smart mobility, smart spaces and green computing. Also, it explains big data analytics for IoT including enabling technologies, types of IoT data analytics, and challenges. The module provides hands-on expertise in designing and developing IoT web services and APIs.

Text Books:

- Building the Web of Things: With Examples in Node.Js and Raspberry Pi, by Dominique D Guinard, Vlad M Trifa; Manning publications; last edition.
- Big Data Analytics for Internet of Things, by Tausifa Jan Saleem , Mohammad Ahsan Chishti, last Edition

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 484	رقم المقرر و رمزه: ٤٨٤تم
Course Name: Cloud Computing	اسم المقرر: الحوسبة السحابية
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:* IT328
Level: *8*	*Co-requisites:*

Course Description:
This course presents the Cloud infrastructure, architecture, and different service models (Saas, Paas and Iaas). A comprehensive study of the Cloud reference model is provided, including: storage technologies, virtualization, resources control, services orchestration. The course also covers important concerns regarding Cloud deployment: security, business continuity and service management.

Text Books:

1. Cloud Infrastructure and Services Version 2, Student Guide Volumes 1&2, EMC Corporation, latest edition.

Approved by the College Council in its 20th meeting on 26/6/1439H

Head of Department Dean of College

Course Code: IT 485	رقم المقرر و رمزه: ٤٨٥تم
Course Name: Robotics fundamentals	اسم المقرر: أساسيات الروبوتات
Credits (lecture +lab +tutorial): 3 (2+2+0)	*Pre-requisites:*
Level: 8	*Co-requisites:*
Course Description: This course provides an overview of robot mechanisms, dynamics, and intelligent controls. Topics include planar and spatial kinematics, motion planning; mechanism design for manipulators, multi-rigid-body dynamics, Topics also include robots programming tools such as control design, actuators, and sensors, localization, mapping, and navigation.	
Text Books: 1. Introduction to AI Robotics R. Murphy (MIT Press) for latest edition.	
Approved by the College Council in its 3d meeting on 3/2/1442H	
Head of Department	Dean of College

Course Code: IT 486	رقم المقرر و رمزه: ٤٨٦تم
Course Name: Selected Topics in Networks &IoT	اسم المقرر: مواضيع مختاره في الشبكات وإنترنت الأشياء
Credits (lecture +lab +tutorial): 3 (3+0+1)	*Pre-requisites:* IT481
Level: 8	*Co-requisites:*
Course Description: This course will cover advance topics in networking and IOT according to the state of the art in the area.	
Text Books: No textbook required	
Approved by the College Council in its 20th meeting on 26/6/1439H	
Head of Department	Dean of College

Appendix E - Pre/Co-requisite Graph