

**Kingdom of Saudi Arabia**

**Ministry of Higher Education**

**Najran University**

**COLLEGE CATALOG**

**College of Computer Science and Information Systems (CSIS)**

**Academic Year**

**2017/2018**

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**College Administration**

**Dean:** Dr. Abdullah Ali Alabas

**Vice-Dean:** Dr. Abdullah Alwadie

**Vice Dean for Academic Affairs: Dr. Mohammed Asiri**

**Vice Dean for Development and Quality:** Dr. Abdulrahman Saad Althaqfan

**Department of Computer Science**

Head of Department: Dr. Abdulrahman Saad Althaqfan.

**Department of Information systems**

Head of Department: Dr. Ghassan Ahmed Ali

**Academic Units Coordinators**

Development and Quality Unit: Dr. Mohammad Alshargabi

Academic Advising Unit: Dr. Ghassan Ahmed Ali

Scientific Research Unit: Dr. Khairan Rajab

Students Activities Unit: Mr. Ali Alfaify

Alumni Unit: Mr. Faris Alsalem

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**Introduction**

This catalogue presents essential academic information about the College of Computer Science and Information Systems (CSIS) of Najran University. The information includes academic programs offered by each department, description of courses in each program, and detailed curricula.

The information presented in this catalogue is applicable for the academic year 2014/2015. Moreover, the college preserves all rights to change and update information whenever there is a need.

**About the College**

The College of Computer Science and Information Systems was founded at the University of Najran at the beginning of the academic year 1427 - 1428 AH. It was established to meet the needs of the local and regional market in the field of computing and Information Technology. The college is also meant to contribute to the rapid technological and scientific research developments in these sciences in order to serve the renaissance of construction in Saudi Arabia. This is because the areas of computing and information technology are considered important to build modern societies with strong economies that will contribute to the development of the Kingdom to be among the high ranked developed countries in both industrial and technical aspects of the twenty-first century.

The college has proudly adopted the concepts of quality and continuous improvement in the learning outcomes and teaching practices to achieve its noble mission. Currently, the college is working towards obtaining the accreditation from the National Commission for Academic Accreditation and Assessment (NCAAA), as well as from the International Accreditation Board for Engineering and Technology (ABET). The college believes that this will definitely improve the educational system in the college as well as keep pace with the global educational systems.

The Department of Computer Science and the Department of Information Systems were the first to be established in the college. Together they have formed the first nucleus of the college. Both Departments have started in the academic year of 1427-1428 AH in order to keep pace with the development of various fields of computer science and Information Systems, and to provide an educational environment that adheres to international standards in its area. The college has the confident that this will help in preparing graduates who are specialists and prominent in the field of information technology and communications, in general, and the field of computer science and Information Systems in particular. This will not only service the industry in the Kingdom but also will contribute to the development of its scientific research. The department of Computer Science grants its students bachelor's degrees in Computer Science upon fulfilling the program requirements that include successfully passing 134 credit hours. The department of Information Systems of grants its students bachelor's degrees in Information Systems upon fulfilling the program requirements that include successfully passing 135 credit hours.

**Departments of the College**

Currently the college offers its programs through two departments operating in both boys and girls campuses.

* Department of Computer Science (CS)
* Department of Information Systems (IS)

**CSIS Strategy**

**College Vision**

"Leadership in computing education and researches and effective contribution in community development"

**College Mission**

* Prepare high quality graduates through well-chosen and continuously developed programs.
* Conduct consistent high quality scientific research for the academic and community development.
* Provide high quality training and consultation services to meet the community needs.

**College's Objectives**

* Enhance the college's educational recognition at the national level.
* Prepare competent graduates to meet nation's needs.
* Reach national prominence in scientific research at the national level.
* Strengthen the partnership with the community.

## 

**Program Advisory Committee (PAC)**

The Development and Quality Unit with the Public Relation Committee arrange annual meeting with the PAC for each program,. The heads/coordinators of both CS and IS programs meet once a year with the PAC to know whether the current students outcomes (SOs) and Program Educational Objectives (PEOs) meet the needs of the labor market. Specifically, the members of PAC evaluate the importance of SOs through surveys and ensure that the outcomes are still in-line with the dynamic needs of the industry. In addition, PAC's members are also involved with any major changes that could happen in the program.

**College Counseling**

College counseling system is composed of the Dean, the Heads of Departments, and selected students’ representatives from different academic levels Its main objective is to discuss and solve students’ problems raised during the semester.

**Student Records**

Najran University adopted fully automated system that inherits well defined regulations to keep up student records. This automated system is centrally maintained and operated by University’s ‘Student Record and Registration Department’. Computer Science (CS) and Information Systems (IS) programs are also abided by that automated system. The system regularly provides aggregated statistical data required for planning, reporting and quality assurance. Clear rules are established and maintained governing privacy of information and controlling access to individual student records. This automated system supports eligibility checking for graduation in lights of the program and course requirements.

**Student Management**

The College adopts effective policies and regulations to establish fair and consistent processes of student management, with effective safeguards for independent consideration of disputes and appeals. Class attendance requirements are made clear to students at the time of orientation and are monitored and enforced using an automatic student attendance system. Student appealing and complaining procedures are specified by regulations, published and made widely known at the time of orientation. The college also developed different case specific academic appeal templates to make clear ground of academic appeals. These appealing and complaining procedures protect time against wasting on trivial issues, but still provide adequate opportunities for matters of concern to students to be fairly dealt with and supported by student counseling provisions. Appeal and complaint procedures guarantee impartial consideration by persons or committees independent of the parties involved in the issue, as well as the party that made the decision or imposed the penalty that is being appealed against. Procedures have been developed to ensure that students are protected against subsequent punitive action or discrimination following consideration of a complaint or appeal. For CSIS appropriate policies and procedures are in place to deal with academic misconduct, including plagiarism and other forms of cheating. All appeal and complaint procedures as well as other polices concerning the student management are aligned with the University policies.

**Teaching Staff and Student Involvement in Research**

The CSIS College believes that research is one of three key pillars of academic excellence, along with teaching and community engagement. This is clearly defined at the College’s vision. At CSIS College, we strive to continuously develop our teaching staff and student involvement in research through providing access to quality research space and resources they need such as classroom space, laboratory facilities, and equipment, access to computing facilities and associated software, private study facilities, and research equipment etc.Thefaculty members of CSIS are also aware about the importance of the research outcomes in their career development and student educational studies. Regarding research faculty in contributing by involving student in graduation projects and publishing research at different levels to contribute latest educational development both at faculty and student level. Our faculty members at the college are involved with research, and attend international conferences, and published many of their research papers in reputed national and international journal in their field of specialization.

CSIS College is well developed institute having clear and defined policies to conduct research at different level. These policy guidelines are internationally recognized and provide clear directions to conduct and published creative and original research. Moreover, there is a mechanism that is operated in the CSCI College that provides an opportunity to junior staff to build their knowledge and skills to conduct quality research. This mechanism involves the faculty coordination on regular basis and thorough brainstorming on each and every research topic and assistance of seniors to produce quality research.

**Collaboration with the Deanship of Postgraduate Studies** and the Deanship of Scientific Research of Najran University, CSCI encourages teaching assistants’ (TA) to continue their higher studies within or outside the Kingdom. The College and both the Deanships provide their support for it and are also encouraging faculty researchers and students to conduct genuine and innovative researches which contribute in enriching and serving society.

**Capstone Experiences**

Students in their last year of study are exposed to a significant two semesters personal or group accomplishment capstone experience. This is done through the 491CSS-4, 492CSS-4 for the CS program and the 491CIS-4, 492CIS-4 for the IS program's graduation project course sequence. This experience provides students with the opportunity to bring together knowledge and skills acquired during their studies. It also allows the two departments to assess the extent of achievement of their program outcomes. At the end, students are required to write a structured final report, and give oral presentation with a detailed demonstration**.**

**Student Activity**

CSIS 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.

**College Alumni**

CSIS, through its Graduates Affairs Unit, started an Alumni Association in the Second semester of the academic year 1432/1433 (2011/2012). It functions as an umbrella to bring together graduates of its new and legacy programs. The association helps alumni to keep in touch with one another and with the college to hopefully create a community that leverages former students’ experiences and achievements to benefit current students. Alumni can help CSIS review and assess educational objectives for its programs, as they are in a unique position to evaluate. The CSIS Alumni Association will eventually grow to offer its members benefits in the form of professional and career services. The college administration has recently decided to develop a computerized database to keep all the records of the graduated students named as “alumni” and to update their information continuously.

**Social Activities**

The social committee of the college usually organizes a get-together gatherings for the faculty members at least once a year as well as some sports activities during the year.

**Commitment to Quality Improvement in the Programs**

Quality development and improvement is directly controlled and managed by the university higher authority through the university president undeviating involvement along with the Deanship of Development and Quality relentless support, monitoring, and commitment to establish quality culture. The Development and Quality Unit (DQU) of the CSIS College which is controlled by the Quality Council, chaired by the Dean of the college, has formed numerous committees and sub-committees which include representatives from the programs administrators and the college academic and administrative members. Direct involvement of all the academic and administrative staff creates a generous quality environment in the college as well as in the CS and IS departments that supports further development, control, and improvement of quality in the programs. Committees and sub-committees of the DQU support and advise on mechanisms, policies, procedures, management, and implementation of activities and tasks related to quality control and improvement. Improvements in quality are appropriately acknowledged and great achievements are recognized. All faculty members are involved in the quality improvement processes and their participations are required in all sorts of activities. Seminars, workshops, and training programs that are related to quality have been provided by the Deanship for Development and Quality, as well as internally by the DQU that ensures continued quality monitoring. All academic and administrative staff are members of various committees and sub-committees committed to ensure quality culture throughout the CS and IS programs in the college.

## Undergraduate Programs and Degrees

The degrees offered by the programs of the college are shown in the table below:

|  |  |
| --- | --- |
| **Program** | **Awarded Degree** |
| Computer Science | Bachelor of Science in Computer Science |
| Information Systems | Bachelor of Information Systems |

## Student Admissions

Student admission and registration for both CS and IS programs is performed electronically through the university website (EDUGATE) that is supervised by the Deanship of Admissions and Registration.

Students who want to be admitted to the programs of CS or IS should satisfy the following requirements:

* The student shall only be admitted to the University upon the calculation of his/her average as follows: 30% general aptitude, 30% achievement test and 40% general secondary (academic) if the student wishes to enroll in preparatory year.
* Students from the natural sciences stream (the scientific section) who obtained a balanced ratio not less than 80% will be admitted at the preparatory year according to availability. Those who obtained high rates will be admitted gradually until the last available seat.
* After preparatory year, students can choose one of the following colleges: College of Medicine, College of Dentistry, College of Pharmacy, College of Applied Medical (the departments of Physiotherapy, Medical Laboratories, Radiology, and Nursing), College of Engineering (the departments : Civil Engineering and Electrical Engineering), College of Computer Science and Information Systems (the departments of Computer Science and Information Systems), or College of Administrative Sciences (the department of Business Administration).
* The student should have obtained the general secondary certificate or its equivalent from the Kingdom or abroad.
* No more than two academic years should have elapsed from the date of his/her obtaining such certificate or its equivalent.
* The student should have a good conduct and proper behavior.
* The student should successfully pass any exam or personal interview (if found).
* The student should be medically fit.
* The student should obtain an approval from his employer to pursue his/her studies, if s/he works for any governmental or private body.
* The student should not have been expelled from Najran University or any other university for academic or disciplinary reasons.
* After the student is admitted, if it turns out that he/she has already been expelled for disciplinary or academic reasons, his/her admission shall be considered as void.
* The student meeting the requirements should present the documents stipulated by the Deanship of Admission and Registration at the University.
* The student should not be enrolled for another university degree at the same university or at another university and should not have already obtained such degree.
* Files of students who are late for admission tests (if found) shall be ruled out.
* Files of students who are late for personal interviews (if found) and do not present an acceptable excuse shall be ruled out.
* Students who are late in carrying out the admission procedures within the deadline set by the University, and who do not present excuses that are acceptable by the Deanship of Admission and Registration shall have their admission cancelled.

All admission information for Computer Science or Information Systems program is described publicly in a clear and understandable way on the program websites, including admission requirements, policies and procedures. Source: <http://portal.nu.edu.sa/web/guest/admission-requirements>

## Evaluating Student Performance

The student performance is determined through the assessment of the academic status. A student’s academic status is determined at the end of each semester and appeared in his/her transcript which shows the individual student’s achievements throughout his/her undergraduate study. All policies regarding the evaluation of students’ performances are publicly available on the University’s web portal. The Computer Science and Information Systems programs do follow the same standard.

**Evaluating Students**

A student’s academic status for Computer Science and Information Systems programs could be one of the following:

* Good Standing: This status is assigned to all students at the beginning of their course of study. Students are expected to maintain this standing till their graduation. This involves a minimum GPA of 2.00 out of 5.00 in the student’s cumulative and semester GPA.
* Honors Degree: The first-class honors degree will be granted to students who score a Cumulative grade from 4.75 to 5.00 upon graduation. The second-class honors degree will be granted to students who attain a Cumulative grade between 4.35 and 4.75 upon graduation.
* Academic Warning: A student will be given this status after the final grades have been processed at the end of each regular semester if: (a) cumulative GPA is less than 2.00 (b) semester GPA is less than 2.00 out of 5.00.
* Dismissal from the University: The student shall be dismissed from the university in the following cases:
* If the student receives three consecutive academic warnings for low grade point average below 2.0. However the student may receive a forth opportunity to raise the Cumulative grade, assuming that the students obtains 45 points from 15 credit hours.
* In the event that a student fails to fulfill all graduation requirements within a period that does not exceed 12 semesters.

**Qualifications for First-Class and Second-Class Honors Degree**

* The student must not fail in any course that he has studied in this university or in other universities.
* The student must fulfil all graduation requirements within the minimum period set by the university and without exceeding the maximum number of semesters allowed.
* The student must have studied at least 60% of the graduation requirements.

**Graduation Required**

According to the study plan at the College of Computer Science and Information Systems where the education system is semester based (two semesters in a year), a student is expected to complete Computer Science (CS) program or Information Systems (IS) program within 9 semesters including a year in the Preparatory Year Program (PYP). To graduate from the CSIS College, a student must complete successfully one of the programs:

* CS Program: 134 credit hours (PYP=27+ CS Regular Semester=107)
* IS program: 135 credit hours (PYP=27+ IS Regular Semester=108).

The total credit hours are originated from four requirements:

* University requirements (12 credit hours),
* College requirements (30 credit hours)
* Department requirements (65 credit hours for CS and 66 credit hours for IS) and
* Preparatory year requirements (27 credit hours).

**University Courses Requirements**

University requirements are courses required to obtain a scientific degree, which consists of 6 courses with a total credit hours of 12, as shown in the table below**:**

|  |  |  |  |
| --- | --- | --- | --- |
| **University Requirements** | | | |
| **Sl No.** | **Course Code** | **Course Name** | **Credit Hour** |
| 1 | 111ISL-2 | Introduction to Islamic Culture | 2 (2,0,0) |
| 2 | 112ISL-2 | Islamic Culture 2 | 2 (2,0,0) |
| 3 | 113ISL-2 | Islamic Culture 3 | 2 (2,0,0) |
| 4 | 114ISL-2 | Islamic Culture 4 | 2 (2,0,0) |
| 5 | 201ARAB-2 | Arabic Language Skills | 2 (2,0,0) |
| 6 | 202ARAB-2 | Arabic Writing | 2 (2,0,0) |
| Total Credit Hours | | | **12** |

**College Courses Requirements**

The main objective of the College requirements is to provide the knowledge and information that are essential for students to obtain a Bachelor’s degree from the Faculty of Computer Science and Information Systems at the University of Najran. Requirements of the College consist of 9 different courses a total of 30 credit hours. The requirements of the College cover the courses of Mathematics, Statistics and Probability, Physics, Programming Languages, Data Structures, and Operating Systems as shown in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **College Requirements** | | | | |
| Sl No. | **Course Code** | **Course Name** | **Credit Hour** | **Prerequisite** |
| 1 | 106MATH-3 | Introduction to Integration | 3 (3,0,1) |  |
| 2 | 152MATH-3 | Discrete Mathematics | 3 (3,0,1) |  |
| 3 | 342MATH-3 | Linear Algebra | 3 (3,0,1) |  |
| 4 | 104PHIS-4 | Principles of Physics | 4 (3,2,1) |  |
| 5 | 324STAT-3 | Probabilities and Engineering  Statistics | 3 (3,0,1) |  |
| 6 | 111CSS-4 | Programming Language 1 | 4 (3,2,1) |  |
| 7 | 113CSS-4 | Object Oriented Programming | 4 (3,2,1) | 111CSS-4 |
| 8 | 212CSS-3 | Data Structures | 3 (2,2,1) | 111 CSS-4 |
| 9 | 227CSS-3 | Operating Systems | 3 (2,2,1) | 111CSS-4 |
| Total Credit Hours | | | | **30** |

**Preparatory Year Requirements**

The courses that belong to PYP are divided into Level one and Level two with a total number of 27 credit hours as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Level One** | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
|  | **3** | Computer Skills | 140TEC-3 |
|  | **2** | Introduction of Mathematics | 140MATH-2 |
|  | **2** | Learning, Thinking and Research Skills | 140SKL-2 |
|  | **2** | English Language: Reading Skills | 140ENGG-2 |
|  | **2** | English Language: Writing Skills | 141ENGG-2 |
|  | **2** | English Language: Listening and Speaking Skills | 142ENGG-2 |
|  | **2** | English Language: Grammars | 143ENGG-2 |
|  | **15** | **Total Number of Credit Hours** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Two** | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
|  | **1** | Occupational Ethics | 150MAN-1 |
|  | **4** | Calculus | 150MATH-4 |
|  | **2** | Communication Skills | 150SKL-2 |
|  | **3** | General English  \ | 150ENGG-3 |
|  | **2** | Technical Writing Report | 151ENGG-2 |
|  | **12** | **Total Number of Credit Hours** | |

## Course Numbering

The course code is divided into three sections of numbers or symbols as shown below:

|  |  |
| --- | --- |
| **Course Code** | **Course Name** |
| **111CSS-4** | Programming Language 1 |

3 digits, 3 letters and 1 digit

Explanation:

1. The first section is composed of three digits. The first digit represents the level of program. The second digit represents the path within the courses of the program. While the third digit represents the sequence of the courses of the program.
2. The second section includes three letters (e.g. CSS) which indicates the name of the program or course subject category.
3. The last section represents a single digit that refers to the total credit hours of the course.

The programs and course subject categories offered at Najran university carry three letters symbol. The table below identifies these symbols:

|  |  |
| --- | --- |
| **Symbols for Course Code** | **Interpretation** |
| CSS | Computer Science |
| CIS | Information Systems |
| MATH | Mathematics |
| PHIS | Physics |
| STAT | Statistics |
| ISL | Islamic Culture |
| ARAB | Arabic Language |
| BIOL | Biology |

**Academic Regulations and Policies**

**Academic Advising**

The Academic Advising Unit governs by the college of CSIS aimed to provide the absolute guidance to students through efficacious counseling regarding students’ academic and personal difficulties. Students are formed in groups according to their student ID. Each group has been assigned to an academic advisor to ensure that all students get academic counseling throughout the program. Almost all faculty members of the program should act as academic advisors as part of their job responsibilities and follow the guidelines set by the Academic Advising Unit. These guidelines are being monitored by the coordinator of the unit. Currently, a separate time slot for student advising is being enforced in the advisors’ schedules. Hence, academic counseling is carried out during weekly. Each newly enrolled student is encouraged to meet his/her academic advisor who will in turn create a separate student file for the student. The file should be kept and maintained by academic advisors and should reflect student progress as far as student’s results are concerned. Academic advisors write a summary report on each student progress at the end of each semester. Based on the progress report, academic advisors produce a course plan for the coming semester for each advisee. After preparing a course plan, academic advisors should consult with their students the proposed course plans along with their expected graduation time frame (part of their program plan). They are also accountable to forward the plans to the Academic Advising Unit.

Students' academic appeals are mainly categorized as Add/drop courses, absent excuses, Rechecking of exams and Make up exams. Apart from these academic appeals, other appeals are also considered by the Academic Advising Unit s via an adopted mechanism. Each student is responsible to place an appeal, if needed, through his/her academic advisor using a case specific appeal form. All appeal forms are available on the university website from where student can download. These forms should also be available with the academic advisors. Academic advisors are accountable to consult with the student in details to spot students’ needs and provide guidance to fill out the appeal form. During this consultation process, academic advisors are responsible to bring up necessary documents from the corresponding student file to support his/her opinion. Examples of such documents are student’s transcript, medical excuses, and add/drop forms. The appeal should then be forwarded to the Academic Advising Unit through the University Tracking System (<https://cts.nu.edu.sa/NajranCTS/start>) for further processing. The coordinator of Academic Advising Unit is accountable to check completeness and to verify the ground of each appeal based on the university regulations, college rules and program requirements. If an appeal complies with all requirements, it will be forwarded to the decision making authority (Dean of the college), else it will be returned to the correspondent academic advisor. The Dean then provides decisions on submitted appeals within 7 days. The appeals are sent then to different places depending on the case and decision of each appeal. For instant, successful appeals for rechecking of exams are sent to the college coordinator. The college coordinator will in turn form an evaluation committee and send the appeal to that committee.

**Procedure to Handle Students’ Complaints**

College of Computer Science and Information System developed a comprehensive system to handle students’ complaints. Complaints are normally categorized in the following classes:

#### General Complaints:

These types of complaints that are made by students and have no specific allegation and are normally related to class room facilities, difficulties with class schedule, etc. Students have to visit their academic advisors to make this type of complaint and discuss their issues. Academic advisors will pass the students complaints to the Academic Advising Unit coordinator. The coordinator will review the complaint and, if necessary, will pass it to the decision making authority. The decision making authority will in turn pass the decision back to the academic advisor via the Academic Advising Unit coordinator. The advisor will then notify the student about his/her complaint outcomes.

#### Blind Box Complaints:

These types of complaints are normally case specific with pointed allegation. They are handled with high confidentiality. There is a specific template/form for this type of complaint. The college provides a complaint and suggestion box (Blind Box) in the Computer Science and Information System building, beside the Dean’s office. Students write down their complaints and/or suggestions using the suggested form and drop them in the box. The box is usually opened on the 25th of each month by the Complaint Handling Committee (in presence of at least 2 members). The committee passes the complaints (if any) to the college council for further actions. The Complaint Handling Committee consists of 7 members as follows:

* The Dean
* The Vice Dean
* Director of Administrative staff
* College Coordinator
* Coordinator of Student Advising Unit
* Program Coordinator (CS)
* Program Coordinator (IS)

#### Direct Email Complaints:

In Direct E-mail complaints, students from female campus are allowed to complain directly to the Dean of The College through a specified e-mail address and this kind of complaint is highly confidential and the decision is taken by the dean directly.

**Examination and Grading Systems**

Examination assessment or evaluation system is based on the theoretical and practical exams, homework, exercises, projects and any other scientific activity. A full mark for each course of the curricula for either program is equal to 100 (hundred) points and is divided into two main sections, namely: course work and final examination. The passing mark in each course is 60%.

### Course work grade:

The 50 (fifty) points are assigned for grading course work. Methods of grading include two midterm exams, class tests, quizzes, homework, assignments, exercises, mini projects, report writing, presentation of projects, lab report, lab exams, and any other scientific activity. Grades are distributed on different parts by the course instructor depending on the nature of the course.

### Final exam grade:

The total points for final exam are 50 points. The methods of grading the final exam includes a theoretical exam.

**The Grading system of Najran University:**

|  |  |  |
| --- | --- | --- |
| **Letter of Grade** | **Mark (%)** | **Average Point** |
| A+ | 95 – 100 | 5.00 |
| A | 90 – 94 | 4.75 |
| B+ | 85 – 89 | 4.50 |
| B | 80 – 84 | 4.00 |
| C+ | 75 – 79 | 3.50 |
| C | 70 – 74 | 3.00 |
| D+ | 65 – 69 | 2.50 |
| D | 60-64 | 2.00 |
| F | Below 60 | 1.00 |

**Average and Cumulative GPA:**

The Average and cumulative GPA are calculated every semester for the student automatically by the system.

**Calculating the Semester Average:**

The GPA is calculated considering the following points:

1. Determining the total points obtained in all courses of the semester.
2. Determining the total number of hours registered in the semester.

The average is calculated every semester according to the following equation:

GPA

A student's grade point average (GPA) is determined by dividing the cumulative point value of all courses attempted by the number of units in the student's semester schedule. An example is in the following hypothetical student's report having six subjects in a particular semester.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course** | **Credit-Hours** | **Letter Grade** | **Value Factor** | **Product (Total Grade Point)** |
| **1** | 2 | B+ | 4.5 | 9 |
| **2** | 3 | D | 2 | 6 |
| **3** | 3 | C | 3 | 9 |
| **4** | 4 | D+ | 2.5 | 10 |
| **5** | 1 | B | 4 | 4 |
| **6** | 4 | C | 3 | 12 |
| **Total** | 17 |  |  | 50 |

This student's semester grade point average is (50/17) = 2.94

CGPA (Cumulative GPA): For first semester, students’ GPA is also equals to their CGPA. Afterwards, students’ CGPA is calculated as follows: [(total grade point for semester 1) + (total grade point for semester 2) +……+ (total grade point for semester n)] / total credit taken in all semesters.

Example of calculating CGPA: In the 1st semester a student got 32 total grade points for 11 credits, and in the 2nd semester, the student got 39 total grade points for 14 credits. Hence, the CGPA for this student is:

[(32) + (39)] / (11 + 14) = 2.84 CGPA

The cumulative grade point value is translated as follows:

|  |  |
| --- | --- |
| **Accumulative Points** | **Accumulative Grade** |
| **4.50 upwards** | Excellent |
| **3.75 - 4.50** | Very Good |
| **2.75 - 3.75** | Good |
| **2.00 - 2.75** | Pass |
| **Less than 2.00** | Fail |

## Transfer Students and Transfer Courses

Rules governing admission with credit for previous studies are clearly specified in the student handbooks. The student handbooks for CS and IS programs (available to all students and to the public on the program's website) contain complete information about the program, including the range of courses, program requirements, services and other relevant information. Principal policies regarding student transfer and transferring courses are given below.

**Inter Department transfer (College of Computer Science and Information System)**

Rules regarding transfer among the departments within the College of Computer Science and Information System are given in the following Tables.

Inter-Department transfer policies

|  |  |  |  |
| --- | --- | --- | --- |
| **Maximum number of students allowing to transfer per semester/ term** | **Minimum GPA** | **To** | **From** |
| 5 | 2.5 | Department of Information Systems | Department of Computer Science |
| 10 | 3 | Department of Computer Science | Department of Information Systems |

**Inter College transfer (from other colleges of Najran University to the College of Computer Science and Information Systems):**

Inter-College transfer policies

|  |  |  |  |
| --- | --- | --- | --- |
| **From** | **To** | **Minimum GPA** | **Number of students** |
| College of Medicine | College of Computer Science and Information Systems | 2.25 | 6(4 Computer Science+2 Information Systems) |
| College of Dentistry | College of Computer Science and Information Systems | 2.5 | 6(4 Computer Science+2 Information Systems) |
| Applied Medical Sciences | College of Computer Science and Information Systems | 2.75 | 4(3 Computer Science+1 Information Systems) |
| College of Engineering | College of Computer Science and Information Systems | 3 | 4(3 Computer Science+1 Information Systems) |

Remarks:

* Transfer from any theoretical College to College of Computer Science and Information Systems is not allowed.
* Transfer from Colleges that do not require Preparatory year is not allowed. However, students who completed a Diploma in Information Systems (3 years program with 86 credit hours) from a Community College are allowed to join the Information Systems program. Those students are exempted from the preparatory year (27 Credit hours) and 23 credit hours (from IS courses and general courses).

Transfer from other national universities to the College of Computer Science and Information Systems is allowed considering the following points:

* Verify the conditions and requirements of Najran University transfer.
* Assure the students finish successfully the Preparatory Year.
* Verify the condition of specialization in Najran University.
* Transfer from similar program to Computer science program.
* GPA must be at least 3.25 out of 5 points.

The transferred courses and credits must also satisfy the following regulations:

* Credit hours for the course to be equalized from the other university must be equal to or greater than the credit hours of the corresponding course in the College of Computer Science and Information Systems.
* The equivalent course grade must be more than 80%.

The above rules are also applied for the visitor students.

**Dropping and Adding Rules**

The process of dropping and addingis performed by the student electronically in the first week of each semester through accessing the academic system that belongs to the University Deanship of Admission and Registration:

http://edugate.nu.edu.sa/nu/init

No student is allowed to register a course without passing its pre-requisite course.

Students, who pass all courses without failures, are registered in the courses of the subsequent level beginning gradually after the lower levels according to the study plans approved.

Students, who fail in some courses, are registered in courses that ensure their minimum study load in each semester taking into account the following points:

* No clash in the course study schedule.
* Satisfying the previous requirements of the course or courses to be registered.

**Withdrawal Rules**

The student has the right to withdraw from an academic semester within the withdrawal period announced in the academic calendar for the current semester. No withdrawal is allowed during the last five weeks before the final examination. The student may get chance for the final examination if the college council accepted the student’s excuse.

**Class Attendance**

For academic accomplishment at the college of computer science and information systems students should attend at least 75% of the lectures, tutorials, and practical and laboratory lessons in regular courses. Students failing to meet this requirement in any of his registered courses will be prohibited from attending the final examination of those courses and will have an F grade in the course.

**Career Guidance**

The Deanship of Students Affairs at Najran University play a significant role in career counseling. The deanship helps expected to graduate students with their future career. Full time employees including professionals are available within the deanship of student affairs. This deanship organizes an annual career day event to achieve the following goals:

* To provide university students with a wide spectrum of industrial companies and employers.
* To provide job opportunities to students.

Moreover, academic advisors also provide some kind of career advising to students. They help students on matters related to searching for a job, preparation for interview, and preparing their CVs. Note that academic advisors provide counseling on career planning for the graduating/higher level students depending on the students’ necessities**.**

**Department of Computer Science**

**About the Department**

The Department of Computer Science (CS) was established on the eve of 2007 to meet the high demand of the market and keep abreast of current technological developments. Computer Science is a discipline of interest and demand locally in Saudi Arabia, regionally in the Middle East and internationally worldwide. Currently, there is a high demand of computer professionals who can design and implement computer systems and networks. The Kingdom of Saudi Arabia has focused on computer technology and its utilization as one of the fundamental tools to modernize its industry to cope up with advances in modern technology. It is, therefore, mandatory to prepare highly qualified computer scientists who are capable of mastering the last advances in such a rapidly growing technology. We strive to be one of the leading departments in computer science nationally and internationally, which produce graduates capable of conducting high-quality scientific research. We also attempt to adhere to global standards of teaching computer science, and to enable the students to locate, utilize, and evaluate information and knowledge. It is also paramount to provide a stimulating educational environment that helps students realize their full potential and graduate as educated, competent professionals who stay current on the developments in Information and Communication Technology (ICT) as well as their specialty of computer science.

**Department Goals**

* To utilize various methods for teaching and evaluation to ensure the attainment of learning outcomes for our programs.
* To produce scientific research focusing on applied computer science.
* To create qualitative and quantitative standards to assess the quality of the educational process and ensure the accomplishment of departmental goals.
* To perform periodical assessment of departments and programs using global quality standards in order to obtain academic accreditation for the department.
* To create integrated solutions to problems related to local community and market demand.

**Program Offered**

Currently Computer Science program is offered by the department and the name of degree is Bachelor of Science in Computer Science (B.Sc. in CS).

**Program Vision**

To be well recognized in the field of Computer Science through quality education, research and effective contribution to the community.

**Program Mission**

1. Prepare qualified computer science graduates according to international standards.
2. Contribute significantly in computing research.
3. Provide training, consultancy and services to the community.
4. Provide supportive environment to foster professional development.

**Program Educational Objectives (PEOs)**

After graduation, the graduates of the Computer Science Program are expected to:

1. Join successful profession in the fields of computing.
2. Follow-up life-long learning in the course of higher education, research and professional development.
3. Contribute significantly to community as a part of a team or individually with accountable, legal, ethical and responsible practices.

**Student Outcomes (SOs)**

The following are the Student Outcomes of the CS program which the program must enable students to attain, by the time of graduation:

)a) An ability to apply knowledge of computing and mathematics appropriate to the discipline;

)b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;

(c) An ability to design, implements, and evaluate a computer-based system, process, component, or program to meet desired needs;

(d) An ability to function effectively on teams to accomplish a common goal;

(e) An understanding of professional, ethical, legal, security and social issues and responsibilities;

(f) An ability to communicate effectively with a range of audiences;

(g) An ability to analyze the local and global impact of computing on individuals, organizations and society;

(h) Recognition of the need for and an ability to engage in continuing professional development;

(i) An ability to use current techniques, skills, and tools necessary for computing practice.;

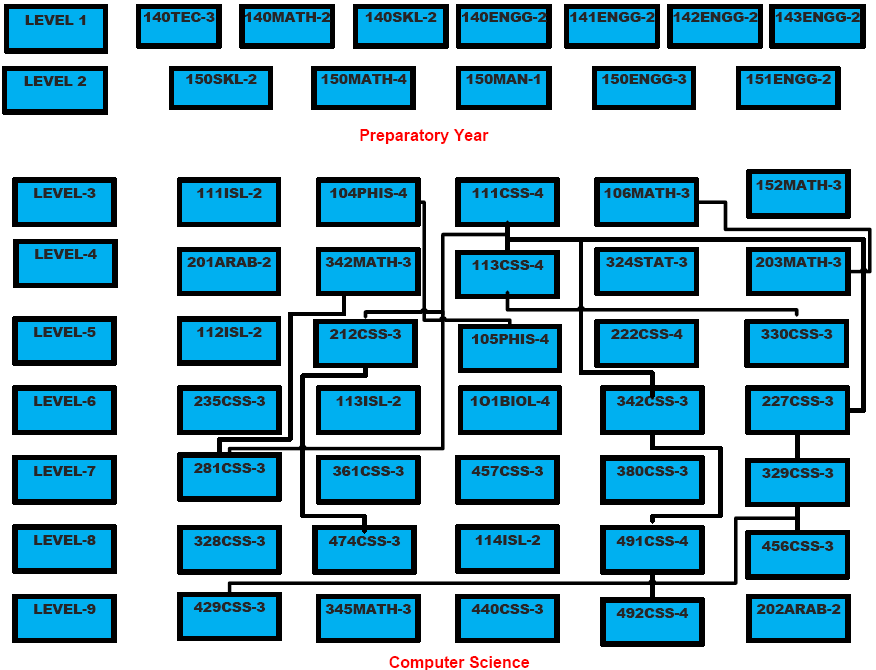
)j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

)k) An ability to apply design and development principles in the construction of software systems of varying complexity.

**List of Courses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Department Requirements** | | | | |
| **Sl No.** | **Course Code** | **Course Name** | **Credit Hour** | **Prerequisite** |
| 1 | 222CSS-4 | Computer Organization and Architecture | 4(3,2,1) |  |
| 2 | 235CSS-3 | Theory of Computation | 3(3,0,1) |  |
| 3 | 281CSS-3 | Computer Graphics | 3(2,2,1) | 111CSS-4, 342MATH-3 |
| 4 | 474CSS-3 | Algorithm Design and Analysis | 3(3,0,1) | 212CSS-3 |
| 5 | 328CSS-3 | Human and Computer Interaction | 3(3,0,1) |  |
| 7 | 329CSS-3 | Data Communication and Computer Networks | 3(2,2,1) | 227CSS-3 |
| 8 | 342CSS-3 | Software Engineering | 3(2,2,1) | 111CSS-4 |
| 9 | 361CSS-3 | Artificial Intelligence | 3(3,0,1) |  |
| 10 | 380CSS-3 | Fundamentals of Database Systems | 3(2,2,1) |  |
| 11 | 429CSS-3 | Computer Security | 3(2,2,1) | 329CSS-3 |
| 12 | 457CSS-3 | Internet Technologies | 3(2,2,1) |  |
| 13 | 456CSS-3 | Parallel and Distributed Systems | 3(2,2,1) | 329CSS-3 |
| 14 | 330CSS-3 | Programming Paradigms | 3(2,2,1) | 113CSS-4 |
| 15 | 491CSS-4 | Graduation Project 1 | 4(0,8,0) | 342CSS-3 |
| 16 | 492CSS-4 | Graduation Project 2 | 4(0,8,0) | 491CSS-4 |
| 17 | 440CSS-3 | Social, Ethical and Professional Issues | 3(3,0,1) |  |
| 18 | 203MATH-3 | Advanced Calculus | 3 (3,0,1) | 106MATH-3 |
| 19 | 105PHIS-4 | Advanced Physics | 4 (3,2,1) | 104PHIS-4 |
| 20 | 101BIOL-4 | General Biology | 4 (3,1,1) |  |
| 21 | 345MATH-3 | Operational Research | 3 (3,0,1) |  |
| Total Credit Hours | | | | **65** |

**CS Program Flowchart**

****

**Program Degree Plan (Regular Semester)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Three** | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
|  | **2** | 111ISL-2 Introduction to Islamic Culture | |
|  | **4** | 104PHIS-4 Fundamental of Physics | |
|  | **4** | 111CSS-4 Programming Language 1 | |
|  | **3** | 106MATH-3 Introduction to Integration | |
|  | **3** | 152MATH-3 Discrete Mathematics | |
|  | **16** | **Total Number of Credit Hours** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Four** | | | |
| Prerequisite | **Credit Hours** | **Course Name** | **Course Code** |
|  | **2** | 201ARAB-2 Arabic Language Skills | |
|  | **3** | 342MATH-3 Linear Algebra | |
| 111 CSS-4 | **4** | 113CSS-4 Object Oriented Programming | |
|  | **3** | 324STAT-3 Probabilities and Engineering Statistics | |
| 106MATH-3 | **3** | 203MATH-3 Advanced Calculus | |
|  | **15** | **Total Number of Credit Hours** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Five** | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
|  | **2** | 112ISL-2 Islamic Culture 2 | |
| 111CSS-4 | **3** | 212CSS-3 Data Structures | |
| 104PHIS-4 | **4** | 105PHIS-4 Advanced Physics | |
|  | **4** | 222CSS-4 Computer Organization and Architecture | |
| **113CSS -4** | **3** | 330CSS-3 Programming Paradigms | |
|  | **16** | **Total Number of Credit Hours** | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Level Six** | | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
| **111CSS-4** | **3** | 227CSS-3 Operating Systems | |
|  | **2** | 113ISL-2 Islamic Culture 3 | |
| **111 CSS-3** | **3** | 342CSS-3 Software Engineering | |
|  | **4** | 101BIOL-4 General Biology | |
|  | **3** | 235CSS-3 Theory of Computation | |
|  | **15** | **Total Number of Credit Hours** | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Level Seven** | | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
| **111CSS-4, 342MATH-3** | **3** | 281CSS-3 Computer Graphics | |
|  | **3** | 361CSS-3 Artificial Intelligence | |
|  | **3** | 457CSS-3 Internet Technologies | |
|  | **3** | 380CSS-3 Fundamental of Database Systems | |
| **227CSS-3** | **3** | 329CSS-3 Data Communication and Computer Networks | |
|  | **15** | **Total Number of Credit Hours** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Eight** | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
| **342CSS-4** | **4** | 491CSS-4 Graduation Project 1 | |
| **329CSS-3** | **3** | 456CSS-3 Parallel and Distributed Systems | |
|  | **2** | 114ISL-2 Islamic Culture 4 | |
|  | **3** | 328CSS-3 Human and Computer Interaction | |
| **212CSS-3** | **3** | 474CSS-3 Algorithm Design and Analysis | |
|  | **15** | **Total Number of Credit Hours** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Nine** | | | |
| **Prerequisite** | **Credit Hours** | **Course Name** | **Course Code** |
| **491CSS-4** | **4** | 492CSS-4 Graduation Project 2 | |
|  | **3** | 345MATH-3 Operational Research | |
|  | **3** | 440CSS-3 Social, Ethical, and Professional Issues | |
| **329CSS-3** | **3** | 429CSS-3 Computer Security | |
|  | **2** | 202ARAB-2 Arabic Writing | |
|  | **15** | **Total Number of Credit Hours** | |

**Faculty Members of CS Department**

**Boys Campus**

Abdulrahman Althaqfan, PhD, Human computer Science – Computer Science, Institute of Technology Florida, 2016

Addin Osman Mohamed Addin, Education, Ph. D., Intelligent Systems, University Putra Malaysia, 2007

Anwar Ali Yahya Esmail, Education – Ph.D. in Computer Science, Universiti Putra Malaysia, Malaysia, Nov. 2007

Khairan D. Rajab, PhD. In Computer Science & Engineering, University of South Florida – USA 2011

ALGHAMDI, ABDULLAH AHMED M, M.Sc., Rochester Institute of Technology, Rochester, New York, Networking and System Administration,2013

Adlan Balola Ali Alshokri, MSC,MIS, Khartoum University, 1995

Haji Moinuddin, MCA, Application, Vishwariah Technological University, 2002

Mohammad Kafil Uddin, MSc, Computer Science & Eng, Pusan National University-Korea, 2009

Muhammad Akram, MS, Computer Science, Blekinge Institute of Technology, Sweden,2008

Mohammad Selim Reza, MSc, Commuter Science & Eng, Islamic University, BD, 2005

Mohammad Alsulami, M. Sc, Computer Science University of Colorado Denver, USA

Mohammad Gazi Golam Faruque, M.Sc., Computer Science & Technology, Rajshahi University, Bangladesh, 2000

Mohammad Hani, M. Sc. In Computer Science, USA

Moussa Alhazzazi, M. Sc. In Computer Science, USA

Sultan Almakdi, M. Sc. In Computer Science, USA

Naif Almudawi, M. Sc. In Computer Science, AU.

Mohammed AlShahri, M. Sc. In Computer Science, USA

**Girls Campus**

ENAAM ABD ELGADER ABD ALLA FRAH, Gezira University-Sudan, MS.c in Computer science, 26/9/2004

Gulshan Aara, M.C.A , Computer Science , IGNOU, New Delhi, 2001.

Engr.Muniba Shaikh, M.Sc , Robot System engineering, University of Southern Denmark, Denmark.

Nazeema Parveen, MCA in Commuter Science, Indra Gandhi University, New Delhi, 2004

Nyla Khadam, MS, Computer Science, International Islamic University, Pakistan, 2008

Raniah Zaheer, M.Sc.(IS) (Master of Science in Information Systems) Osmania University, First Division with Distinction (83%),2002-2004.

Saira Banu, MCA, Computer Applications, University of Madras, India, 2002

Soad Mohammed Fadl almula, M.S.C Computer Science, Sudan University of Science and Technology,2010

Haya Essa S. Aldossary, Master, Advance computer science with specialization in Software technology, Swansea university, 2013

Ms. Nora, M. Sc. In Computer Science

**Department of Information Systems**

**About the Department**

The Department of Information Systems (IS) was established on the eve of 2007 to meet the high demand of the market and keep abreast of current technological developments. The major of Information Systems aims to provide students with the necessary knowledge for a career in the fields of Computer Information Systems (CIS) and programming project management, which involve the development and integration of multi-purpose systems. The importance of this major stem from the fact that development of systems builds on a combination of theory and practice, which have to be founded on sound background and methods in the fields dealing with IT.

**Department Goals**

1)    To establish a scientific, research-oriented environment that helps develop the knowledge and skills of the faculty of the department.

2)    To encourage high-quality scientific research in the field of information systems.

3)    To create qualitative and quantitative standards to assess the quality of the educational process and ensure the accomplishment of departmental goals.

4)    To perform periodical assessment of departments and programs using global quality standards in order to obtain academic accreditation for the department.

5)    To create an educational system that keeps pace with the continuous developments in the field of IT.

**Program Offered**

Currently the Information Systems program is offered by the department and the name of degree is Bachelor of Information Systems (B.Sc. in IS)

**Program Vision**

To be a leader in the field of information systems through seeking excellence in education, research, and community services.

**Program Mission**

* Prepare qualified information systems graduates according to international standards.
* Contribute significantly in information systems research.
* Offer training, consultancy, and services in the field of information systems to the community.
* Provide supportive environment to foster professional development

**Program Educational Objectives (PEOs)**

After graduation, the graduates of the Information Systems Program are expected to:

* Be a leader in the job market for information systems
* Follow-up life-long learning in the course of higher education, research, and professional development.
* Function professionally within a team and respect ethical values.
* Function actively in community services.

**Students Outcomes (SOs)**

By the time of graduation, students of the Information Systems program will attain the following student learning outcomes:

)a) An ability to apply knowledge of computing and mathematics appropriate to the discipline;

)b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;

(c) An ability to design, implements, and evaluate a computer-based system, process, component, or program to meet desired needs;

(d) An ability to function effectively on teams to accomplish a common goal;

(e) An understanding of professional, ethical, legal, security and social issues and responsibilities;

(f) An ability to communicate effectively with a range of audiences;

(g) An ability to analyze the local and global impact of computing on individuals, organizations and society;

(h) Recognition of the need for and an ability to engage in continuing professional development;

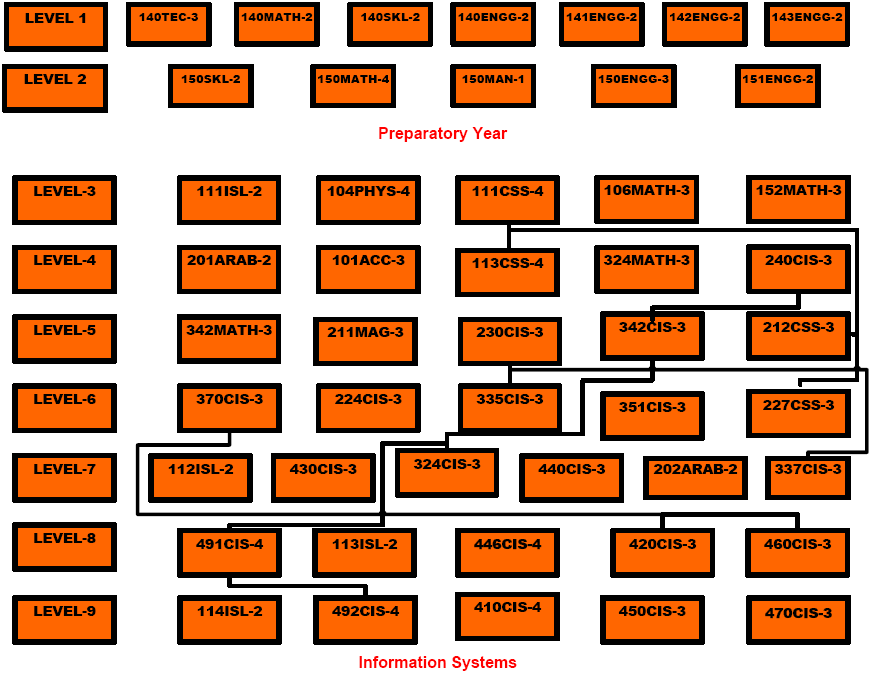
(i) An ability to use current techniques, skills, and tools necessary for computing practice.;

(j) An understanding of processes that support the delivery and management of information systems within a specific application environment

**List of Courses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Department Requirements | | | | |
| Sl No. | **Course Code** | **Course Name** | **Credit Hour** | **Prerequisite** |
| **1** | 101ACC-3 | Principles of Accounting-1 | 3(3,0,1) |  |
| **2** | 211MAG-3 | Management Fundamentals | 3(3,0,1) |  |
| **3** | 224CIS-3 | Visual Programming | 3(2,2,1) |  |
| **4** | 230CIS-3 | Fundamental of Databases | 3(2,2,1) |  |
| **5** | 240CIS-3 | Information Systems Analysis and Design | 3(3,0,1) |  |
| **6** | 324CIS-3 | Modern Applications Development | 3(1,4,1) | 342CIS-3 |
| **7** | 335CIS-3 | Database Management Systems | 3(2,2,1) | 230CIS-3 |
| **8** | 337CIS-3 | Database Management Systems Administration | 3(2,2,1) | 230CIS-3 |
| **9** | 342CIS-3 | Information Systems Engineering | 3(2,2,1) | 240CIS-3 |
| **10** | 351CIS-3 | Information Systems Project Management | 3(2,2,1) |  |
| **11** | 370CIS-3 | Data Communication and Computer Networks | 3(2,2,1) |  |
| **12** | 410CIS-3 | Information Systems Policies and Strategies | 3(3,0,1) |  |
| **13** | 420CIS-3 | ICT Network Administration | 3(2,2,1) | 370 CIS-3 |
| **14** | 430CIS-3 | Electronic Business | 3(2,2,1) |  |
| **15** | 440CIS-3 | Multimedia Technologies | 3(2,2,1) |  |
| **16** | 446CIS-4 | Internet Applications Development | 4(3,2,1) |  |
| **17** | 450CIS-3 | Decision Support Systems | 3(2,2,1) |  |
| **18** | 460CIS-3 | Information Systems Security Administration | 3(2,2,1) | 370 CIS-3 |
| **19** | 470CIS-3 | Geographic Information Systems | 3(3,0,0) |  |
| **20** | 491CIS-4 | Project 1 | 4(0,8,0) | 342CIS-3 |
| **21** | 494CIS-4 | Project 2 | 4(0,8,0) | 491CIS-4 |
| Total Credit Hours | | | | **66** |

**Information Systems Program Flowchart**



**Program Degree Plan (Regular Semester)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Three** | | | |
| **Course code** | **Course title** | **Credit hours** | **Pre requisite** |
| **111ISL-2** | Introduction to Islamic Culture 1 | 2 |  |
| **104PHIS-4** | Principles of Physics | 4 |  |
| **111CSS-4** | Computer Programming-1 | 4 |  |
| **106MATH-3** | Introduction to Integration | 3 |  |
| **152MATH-3** | Discrete Mathematics | 3 |  |
| **Total credit hours** | | **16** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Four** | | | |
| **Course code** | **Course title** | **Credit hours** | **Pre requisite** |
| **201ARAB-2** | Arabic Language Skills | 2 |  |
| **101ACC-3** | Accounting Principles | 3 |  |
| **113CSS-4** | Object Oriented Programming | 4 | 111CSS-4 |
| **324MATH-3** | Probabilities and Engineering Statistics | 3 |  |
| **240CIS-3** | Information Systems Analysis and Design | 3 |  |
| **Total credit hours** | | **15** |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Level Five** | | | | | | |
| **Course code** | | **Course title** | | **Credit hours** | **Pre requisite** | |
| **342MATH-3** | | Linear Algebra | | 3 |  | |
| **212CSS-3** | | Data Structures | | 3 | 111CSS-4 | |
| **230CIS-3** | | Fundamental of Databases | | 3 |  | |
| **342CIS-3** | | Information Systems Engineering | | 3 | 240CIS-3 | |
| **211MAG-3** | | Principles of Management | | 3 |  | |
| **Total credit hours** | | | | **15** |  | |
| **Level Six** | | | | | |
| **Course code** | **Course title** | | **Credit hours** | | **Pre requisite** |
| **227CSS-3** | Operating Systems | | 3 | | 111CSS-4 |
| **370CIS-3** | Data Communication and Computer Networks | | 3 | |  |
| **224CIS-3** | Visual Programming | | 3 | |  |
| **335CIS-3** | Database Management Systems | | 3 | | 230CIS-3 |
| **351CIS-3** | Information Systems Project Management | | 3 | |  |
| **Total credit hours** | | | **15** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Seven** | | | |
| **Course code** | **Course title** | **Credit hours** | **Pre requisite** |
| **112ISL-2** | Introduction to Islamic Culture 2 | 2 |  |
| **430CIS-3** | Electronic Business | 3 |  |
| **324CIS-3** | Modern Applications Development | 3 | 342CIS-3 |
| **440CIS-3** | Multimedia Technologies | 3 |  |
| **202ARAB-2** | Arabic Writing | 2 |  |
| **337CIS-3** | Database Management Systems Administration | 3 | 230CIS-3 |
| **Total credit hours** | | **16** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Level Eight** | | | |
| **Course code** | **Course title** | **Credit hours** | **Pre requisite** |
| **491CIS-4** | Project-1 | 4 | 342CIS-3 |
| **113ISL-2** | Islamic Culture 3 | 2 |  |
| **446CIS-4** | Internet Applications Development | 4 |  |
| **420CIS-3** | ICT Networks Administration | 3 | 370CIS-3 |
| **460CIS-3** | Information Systems Security Administration | 3 | 370CIS-3 |
| **Total credit hours** | | **15** |  |
| **Level Nine** | | | |
| **Course code** | **Course title** | **Credit hours** | **Pre requisite** |
| **114ISL-2** | Islamic Culture 4 | 2 |  |
| **492CIS-4** | Project-2 | 4 | 491CIS-4 |
| **410CIS-3** | Information Systems Policies and Strategies | 3 |  |
| **450CIS-3** | Decision Support Systems | 3 |  |
| **470CIS-3** | Geographic Information Systems | 3 |  |
| **Total credit hours** | | **16** |  |

**Faculty Members**

Mohammed Abdulatef Al-Shargabi, Ph. D.,Computer Networks, University Technology Malaysia, 2011

Fekry Olayah, Ph. D., Information System Technology , University of Banking and Financial Science, Jordan,2010

Dr. Asadullah Shaikh, Ph.D., Software Engineering, University of Southern Denmark, Denmark, 2012

Dr. Mohd Khairi, Ph.D., Master Data Management, University of Phoenix , USA

Ghassan Ahmed Ali, Ph.D. Universiti Sains Malaysia (USM), Digital Forensics, Information System, 2011

Shah Murtaza Rashid Al Masud, M.Sc., Commuter Engineering, Kharkov State Technical University of Radio Electronics, Kharkov, Ukraine, 2001

Mohammed Basit Kamal, MCA, Osmania University, India, 2005

Yahya Ali, M.Sc. in Computer Science, UTM, Malaysia, 2007

Omer Abdulrahman, M.Sc. in Computer Science, Gezira University, Sudan, 2005

Mohammed Haif, Master in Computer Science, USA

**Course Catalog**

**College Requirements**

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 106MATH-3 | Introduction to Integration | 3(3,0,1) |  |

**Course Contents:**

The integral and its properties, Riemann sums and the definite integral, area under a curve, formal properties: Additivity, linearity, triangle inequality, the fundamental theorem, indefinite integrals, integration by substitution, integration of powers of sinus and cosines, integration by parts, integration of rational functions with linear or quadratic denominator, and a variety of applications of integration.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 152MATH-3 | Discrete Mathematics | 3(3,0,1) |  |

**Course Contents:**

Number systems; Logic: conjunctions, logical equivalence and arguments, predicate logic; propositional logics, methods of proofs. Sets: operations on sets, Cartesian products. Relations: Equivalence relations, order relations, functions, counting principles, permutations and combinations, trees and graph.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 342MATH-3 | Linear Algebra | 3(3,0,1) |  |

**Course Contents:**

Linear equations, matrix representation of linear equations, inverse of matrix, symmetric matrices, determinants, vector representation, relationship between vectors, vector spaces and subspaces, linear independence, basic of vector spaces, linear transformations, bases of vector spaces, linear transformations, rank of matrix, Eigen values and eigenvectors, and orthogonality and least squares.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 104PHIS-4 | Principles of Physics | 4(3,2,1) |  |

**Course Contents:**

Vectors; uniformly accelerated motion; Newton's laws; work, energy and power; oscillatory motion; wave motion; electrostatics; the electric field and the electric potential; electric current; magnetic fields and electromagnetic waves; atomic models; crystal structures and bonding in solids; free electron theories of solids; semiconductors; semiconductor devices.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 324STAT-3 | Probabilities and Engineering Statistics | 3(3,0,1) |  |

**Course Contents:**

Concepts of statistics and its applications in science and engineering, measure of central tendency, measure of dispersion, regression, correlation, and their applications. Concepts of probability and its applications in science and engineering, probability axioms, conditional probability, independent probability for events, some probability distributions and random variables: discrete and continuous random variables, some important probability distributions (discrete and continuous), computer applications using statistical software.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 111CSS-4 | Programming Language 1 | 4(3,2,1) |  |

**Course Contents:**

Introduction to C programming language, algorithms, flowcharts, data types, identifiers, storage classes, constants, operators, expressions, statements, console I/O statements, selection statements, switch, iteration statements, jump statements, function calls, Arrays, pointers, structures, unions, enumerations, file I/O, and basic principles of the C++ programming language (e.g. data types, objects and classes).

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 113CSS-4 | Object Oriented Programming | 4(3,2,1) | 111CSS-4 |

**Course Contents:**

Introduction to object oriented programming (OOP) concepts, basic Java syntax, introduction to objects and classes, data types, variables and operators, selection and control structures, array, properties of classes, inheritance, package and interface, abstract class, polymorphism, exception handling, thread, multithreading, file system, I/O, applet, Java Network, Interface, Interface Development Environment.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 212CSS-3 | Data Structures | 3 (2,2,1) | 111CSS-4 |

**Course Contents:**

Study of common Abstract Data Types (ADTs), basic data structures and design and analysis of algorithms. Common ADTs: stack, queue, list, tree, priority queue, map and dictionary. Basic Data structures include arrays, linked lists, heaps, hash tables, search trees. Basic design and analysis of algorithms covers asymptotic notation, recursive algorithms, searching and sorting, tree traversal, graph algorithms.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 227CSS-3 | Operating Systems | 3 (2,2,1) | 111CSS-4 |

**Course Contents:**

Introduction, history and evolution of operating systems, operating system structure, process management and scheduling, inter process communication, process coordination and synchronization, threads (overview, multithreading model and threading issues), CPU scheduling (Basic concepts and scheduling algorithms), deadlocks (deadlock characterization, methods for handling deadlock), deadlock prevention, deadlock avoidance and detection, memory management, introduction to protection and security issues, introduction to file management and application.

**Department of Computer Science Requirements**

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 203MATH -3 | Advanced Calculus | 3(3,0,1) |  |

Infinite Sequences, Infinite series, convergence and divergence of infinite series, integral test, ratio test, root test and comparison test. Conditional convergence and absolute convergence, alternating series test. Power Series, Taylor and Maclaurin series, Vector valued functions, their limits, continuity, derivatives and integrals. Motion of particle in space, tangential and normal components of acceleration. Function in two or three variables, their limits, continuity, partial derivatives, chain Rule, directional derivatives, tangent planes and normal lines to equations, Extrema of Functions of Several Variables, Lagrange Multipliers, Double integral and its applications to area, volume, moments and center of mass. Double integrals in polar coordinates, triple integral in rectangular, cylindrical and spherical coordinates and applications to volume, the moment and center of mass. Vector fields, line integrals, surface integrals, Green’s theorem, and the divergence theorem. Stoke’s theorem.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 222CSS-4 | Computer Organization and Architecture | 4(3,2,1) |  |

**Course Contents:**

This course will develop Assembly Language programming to illustrate the role and interaction between computers main component, specifying on assembly instructions and addressing: data transfer instructions, arithmetic instructions, logical instructions, conditional and unconditional branch instructions, loop instructions, and procedure calls, macro instructions.

Then it will also discuss on the Number Systems (decimal, hexadecimal and binary) and their basic operations. Relating the computer basic units' organization and design such as memory, control, arithmetic and logic unit, and registers with computer instructions and addressing modes, timing and control, execution cycle of instructions, Input, output and interrupt.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 212CSS-3 | Data Structures | 3 (2,2,1) | 111CSS-4 |

**Course Contents:**

Study of common Abstract Data Types (ADTs), basic data structures and design and analysis of algorithms; Common ADTs: stack, queue, list, tree, priority queue, map and dictionary. Basic Data structures include arrays, linked lists, heaps, hash tables, search trees. Basic design and analysis of algorithms covers asymptotic notation, recursive algorithms, searching and sorting, tree traversal, graph algorithms.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 330CSS-3 | Programming Paradigms | 3 (2, 2, 1) | 113CSS-4 |

**Course Contents:**

Introduction to programming languages, the static and dynamic scope, communication between subprograms via parameter passing, and storage management (static and dynamic), languages using virtual machines: Java programming language is discussed as an example of languages that use virtual machines (VM); the main differences between C++ and Java, Introduction to functional programming (basic skills about Scheme programming language), general differences between the Scheme and the C programming language, logic programming, modern programming (e. g. Python and C#).

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 105PHIS-3 | Advanced Physics | 3(3,0,1) |  |

**Course Contents:**

Atomic structure: electronics configuration, classification of elements, energy levels. Crystal structure: lattice, symmetry, space group, examples for simple structure. Electrical properties of materials and electricity: classification of materials. Magnetic properties of materials and magnetism. Thermal properties of materials: thermal energy, thermoelectric power (Seebeck Effect). Mechanical properties of matter (Young's modulus, tensile materials).

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 235CSS-3 | Theory of Computation | 3 (3,0,1) |  |

**Course Contents:**

Introduction to languages, Alphabets and strings, concatenation, languages, operations on strings and languages, regular expressions and regular languages. Analysis of Finite-state Automata, regular expressions and equivalence with automata, Non-deterministic FA and their equivalence to deterministic FA, and Pumping Lemma, Push-down Automata and equivalence with context-free grammars. Introduction to Turing Machines and various models of TM’s and their equivalence. Study of Context-Free Grammars and languages, transitions between grammars and machines, derivations and derivation trees. Simplification of context-free grammars and Chomsky normal form. Brief introduction to Decidability, Reducibility, Un-decidability, Time Complexity including the classes P and NP

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 342CSS-3 | Software Engineering | 3 (2,2,1) | 111CSS-3 |

**Course Contents:**

Study of common Software Engineering, comprehensive introduction to software engineering. It gives an introduction to basic concepts, principles and techniques used in software engineering. It discusses the nature of software and software projects, software development models, software process maturity, project planning, management, and communication. This course gives an introduction to methods for analysis, design, testing, and implementation of large, complex software systems.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 101BIOL-3 | General Biology | 3 (3, 0, 1) |  |

**Course Contents:**

Basic principles of general biology as they relate to the cellular, organismic and population levels of organization; Includes cell ultra structure and function, energy transfer, reproduction, genetics, evolution, diversity of organisms, and ecology.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 281CSS-3 | Computer Graphics | 3 (2, 2, 1) | 111CSS -4 342MATH-3 |

**Course Contents:**

This course is dedicated to introduce the fundamental concepts in creating computer graphical images. Computer graphics is a multidisciplinary field which uses different ideas from art, mathematics, and computer science to create images. In this course the students study OpenGL that has combinations with C and C++ to create graphical images by writing frequent programs and solve problem sets. Topics to be covered in this course as: Introduction to graphics concepts, basic graphics programming and OpenGL (or 3D Max), basic raster graphics algorithms and primitives, scan conversion, graphics hardware, 2D geometrical transformations, 3D geometry and viewing, hierarchical modeling, input devices and techniques, lighting and color, projections, hidden surface removal, and shading and rendering.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 361CSS-3 | Artificial Intelligence | 3 (3,0,1) |  |

**Course Contents:**

Introduction to Artificial Intelligence: Intelligent agents and knowledge representation (semantic networks, frames, propositional and high-order logics), Searching Techniques: Uninformed search algorithms (breadth first and depth first with related strategies; branch-and-bound and optimal path; memory-bounded search strategies), Heuristic search (Greedy search, A\*-search, and hill climbing), Logic: Predicate and propositional logic, resolution and deductive proof techniques (e. g. generalized modus ponens), Planning: Planning operators/languages, planning

algorithms including (partial-order planning, re-planning, and conditional planning), Reasoning with uncertainty, decision making: Introduction to probability, Bayesian Rule, Belief Networks and inference with them; basic concepts of decision theory and decision making, Learning: General concepts of learning with introduction to PAC theory; learning algorithms including: decision trees and decision lists, hypothesis space learning, and perception, Agent interaction: Basic concepts of agent communication and coordination, including adversarial search and game theory, Philosophical concerns: Including questions about possibility of achieving intelligent

behavior, intentionality, Constraint Satisfaction Problems: Game playing, machine learning, natural language processing, expert Systems, vision and Robotics, Introduction to Prolog: Presentation of prolog (the program and query) and the facts (simple facts, facts with arguments and how to query).

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 380CSS-3 | Fundamentals of Database Systems | 3 (2,2,1) |  |

**Course Contents:**

Study of fundamental concepts and techniques of modeling and design of databases and database programming languages. We begin with an introduction to Databases, architecture of Database Management Systems (DBMS), overview of database design and SQL programming language. Two database design models and notations: the entity relationship (E/R) and Object-Oriented (e.g. Object Definition Language ODL). Relational database theories, including the conversion of E/R to normalized relational databases, functional dependencies and normalization. Relational Algebra. Advanced SQL covers sub-queries and views, triggers integrity constraints. Brief overview of XML data model, data warehouse, data mining, and data security, if time permits.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 457CSS-3 | Internet Technologies | 3 (2,2,1) |  |

**Course Contents:**

Study the history and fundamentals of the internet, Common web applications, types of web pages, web publishing and to learn about Internet protocols (HTTP, TCP/IP and FTP), Client/Server Architecture and the MVC approach in Website design. Programming with HTML, XHTML, cascading style sheets (CSS), and JavaScript, client and server side scripting, develop dynamic web application with PHP or ASP and MySQL. Finally, evaluating web sites and applications and learning about web privacy and various security issues.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 329CSS-3 | Data Communication and Computer Networks | 3(2,2,1) | 227CSS-3 |

**Course Contents:**

Data transmission and physical infrastructure, flow control and error control, layered models, LAN and WAN-systems, packet and circuit switching, internetworking and IP, transport layer protocols (e.g. TCP and UDP), communication Models, applications (DNS, SMTP, FTP, HTTP, Telnet, etc.).

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 491CSS-4 | Project 1 | 4(0,8,0) | 342CSS-3 |

**Course Contents:**

This course provides to student with the opportunity to carry out a collective piece of supervised work; relevant to their degree. Writing and presentation skills, visibility study, specification of software requirements and software life cycles, software projects planning, assessment, control and scheduling, resources allocations, risk management, and other topics such as: software re-use, quality assurance, control and management, human factors in controlling people, leader and team building, maintenance and management tools (e.g. MS Project).

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 474CSS-3 | Algorithm Design and Analysis | 3(3,0,1) | 212CSS-3 |

**Course Contents:**

This course introduces various algorithm design paradigms and the basics of computational complexity analysis using different models of computations with the overview of mathematical essentials, space and time complexities, asymptotic notations. Design and analysis of algorithms covers linear programming, greedy algorithms, divide-and-conquer, backtracking, branch-and-bound, search methods, graph algorithms and introduction to NP-Completeness.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 328CSS-3 | Human and Computer Interaction | 3(3,0,1) |  |

**Course Contents:**

Theoretical concepts of human-computer interaction (HCI), design principles for graphical computer interfaces, dimensions and multi-disciplinary nature of human computer interaction, user interface design, user requirements analysis, user modeling, task analysis, general principles in user interface design, principles, rules and models in human-centered design, design guidelines, standards and style guides, dialogue styles, , ergonomics and human factors, usability, toolkits, development environments and user interface management systems, formative and summative evaluation, user interfaces for the web, enhanced human-computer interaction, and advanced issues in human-computer interaction.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 456CSS-3 | Parallel and Distributed Systems | 3 (3,0,0) | 329CSS-3 |

**Course Contents:**

Introduction to parallel systems; Processes and processors; Parallel architectures (multi-computer, multi-processor); Performance of Parallel systems (speedup, efficiency, etc.); Characterization of distributed systems; System models; Inter-process communication; Remote invocation; Distributed operating system; and Distributed file systems.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 492CSS-4 | Project 2 | 4 (0,8,0) | 491CSS-4 |

**Course Contents:**

During this course, every group must do oral presentations and present and describe the software they have developed for the project. At the end of the course and after the approval of the supervisor about what have been accomplished, the group must submit a complete package containing the software developed for the project, any devices that are essential for the project, preparation of a manual user specific model and a written report about the project satisfying the university report requirements. In addition, they have to present and defend their project.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 429CSS-3 | Computer Security | 3 (2,2,1) | 329CSS-3 |

**Course Contents:**

Introduction to Computer security and basic cryptography topics. Study the various developments in security, with emphasis on public-key encryption, secret key systems, the data encryption & Decryption standards , control and protection methods, elements of technical security: authentication, integrity, availability, auditing, non-repudiation, confidentiality/privacy/secrecy. Message authentication and hash functions, hash and MAC algorithms, digital signatures and authentication protocols, internet security, security flaws and vulnerabilities, malicious software, firewalls, intrusion detection methods.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 440CSS-3 | Social, Ethical and Professional Issues | 3 (3,0,1) |  |

**Course Contents:**

This course aims at developing the ethical reasoning skills and sensitivities that computer professionals will need to make good decisions and to justify them. The course includes a general introduction to ethical theories and their use in making and justifying decisions. It admits discussions and explorations of various issues and case studies, illustrating the kinds of problems that can arise from the use and misuse of computers and technology, the responsibilities of computing professionals, ethics on the internet (hacking, computer crime, and netiquette), privacy and social issues.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 345MATH-3 | Operation Research | 3 (3,0,1) |  |

**Course Contents:**

This course provides an introduction to the key aspects of operations research methodology. Students will model and solve a variety of problems using deterministic and stochastic operations research techniques. It provides an overview of the entire suite of techniques and some idea of how the elements fit together. This course includes the following topics:

Introduction to Operations Research: Optimization Models and Examples:

Linear Programming: Models, Graphical Solution, Simplex Algorithm and Goal Programming, Sensitivity Analysis and Duality 2 , Transportation Models ,Network Models and Algorithms.

Integer Programming: Modeling with integer variables, Branch and Bound Methods

Sequencing models: Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.

Dynamic Programming: Characteristics of dynamic programming. Dynamic programming approach for Priority Management employment smoothening, capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems; Queuing Models

Nonlinear Programming: Nonlinear Models, KKT conditions, Constrained/Unconstrained optimization, Algorithms;

Stochastic analysis: Game theory, Decision analysis, Inventory theory, Markov chains, Queuing analysis and simulation.

**Department of Information Systems Requirements**

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 240CIS-3 | Information Systems Analysis and Design | 3 (2, 2, 1) |  |

**Course Description:**

This course is concerned with the fundamental knowledge, methods and skills needed to analyze, design and implement computer-based systems. It addresses the role of the systems analyst, and the techniques and technologies used. The structured software development life cycle approach, modeling techniques and development phases are comprehensively discussed and reviewed. In modeling techniques, process models, information models, system architecture models, and object oriented models are thoroughly described. A project is given to all students that should cover analysis and design phases of a relatively data-oriented business case; with emphasis on data modeling (ER diagrams), process modeling (DFDs), and architectural system design issues (DD, HIPO, IPO).

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 224CIS-3 | Visual Programming | 3 (2, 2, 1) |  |

**Course Description:**

In this course, the main concepts and methods used in visual programming languages are given. For a carefully selected visual programming language, the following topics are studied: the syntax and semantics of the language, data types, conditional statements, loops, data structures, modular programming, review of relevant OO techniques and methodologies, user interface design rules, materializing an interface as a set of visual objects, file types and structures, file applications, publishing an interface on the web, basic concepts of HCI (human computer interface), comparison between the selected language and other visual programming languages.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 230CIS-3 | Fundamentals of Database Systems | 3 (2, 2, 1) |  |

**Course Description:**

In this course, students should study the following topics: characteristics and advantages of the database management systems (DBMS), database concepts and architecture; data models, database schemes and instances, DBMS and the concept of program-data independence, database languages and interfaces, database models, relational data model and relational algebra, relational model constraints; domains, keys, and integrity constraints, the structured query language (SQL); data definition, queries, update, statements, and views in SQL, database design; functional dependencies, normal forms, introduction to object oriented (OO) databases.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 342CIS-3 | Information Systems Engineering | 3(2, 2, 1) | 240CIS-3 |

**Course Description:**

This course covers the following topics: the advanced steps in software developing such as types of software testing and user acceptance testing, different strategies used in software installation, processes of maintaining information systems; types of maintenance, measuring and controlling of maintenance effectiveness, software quality assurance, quality concepts, the ISO 9000 & ISO 9126 quality factors, technical metrics for software and examples of function-based, specification quality, testing metrics, technical metrics for software sizing, object-oriented systems metrics, software development methodologies, requirement engineering and configuration management.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 324CIS-3 | Modern Applications Development | 3 (1, 4, 0) | 342CIS-3 |

**Course Description:**

In this course, modern programming trends and techniques are given, and their usage in developing real applications for society organizations. Students go through a learning curve that starts by understanding a problem, analyzing it, sketching a solution, implementing the solution, documenting it and finally presenting the work in a professional manner. Hence, all these skills must be emphasized in this course. This course is intended to widen the vision of students and gives them a flavor of the real world problems that can be tackled using programming languages, as opposed to higher level tools such as CASE tool or DB packages. Projects must be selected carefully to provide the student with skills in modern applications, e.g. e-commerce applications. The programming language can be any of the languages studied before. Students must be able to finish 2-3 large projects during the period of this course. Modern trends of software development, e.g. component-based and aspect-based programming will be covered.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 370CIS-3 | Data Communication and Computer Networks | 3(2, 2, 1) |  |

**Course Description:**

This course covers the following topics: definition of computer networks and their objectives and applications, computer network types; LANs, PANs, MANs and WANs, computer network architecture: layering, protocols and standard models, the ISO OSI and TCP/IP reference models, physical layer of computer network: the transmission media; signal types, signal characteristics and impairments, modulation techniques and modems, digital signal encoding schemes; NRZ, Manchester and AMI encoding, physical interface; USART, RS-232C/V.24, and USB, data transmission basics: synchronous and asynchronous transmission, synchronization levels; bit, character and frame, transmission modes; full , half duplex, simplex , parallel and serial, data link layer: data link layer functions and standards, ARQ protocols; stop and wait, Go-back-N, and selective reject, DLC protocol standards; HDLC , Internet PPP and SLIP, local area networks: topology and media access methods, LAN protocols and the IEEE 802 standard, Ethernet and IBM token ring LANs, wireless LANs, WANs and data transport networks; GSM cellular, satellite, ATM & ISDN.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 335CIS-3 | Database Management Systems | 3 (2, 2, 1) | 230CIS-3 |

**Course Description:**

This course covers the following topics: DBMS architecture and administration; centralized and client-server approaches, system catalog, and data dictionary, transaction management; concepts, characteristics, and processing, recovery techniques, concurrency control techniques: serializability, deadlock, locking schemes, time-stamp ordering, multi-version, and optimistic techniques, DB security, distributed databases, distributed DBMS, data fragmentation and replication, distributed transactions management, object-oriented databases, introducing to new emerging DB technologies and applications; Web DBs, multimedia DBs, data warehousing , data Mining, … etc.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 351CIS-3 | Information Systems Project Management | 3(3,0,1) |  |

**Course Description:**

This course provides an introductory terminologies, concepts, related to IT, IS, management, project, and project management. Project management context models (structural and behavioral) such organizational, technological, and business are discussed with emphasis to responsibilities and behavior of project manager and project team, and the role of ICT in any IS project management. The course addresses essential topics to project management such as project group process (initiating, planning, executing, controlling, and closing) and knowledge areas (project integration, scope, time, cost, quality, human resource, communications, risk, procurement). Project management software is used to provide students with a hands-on experience to effectively use software to manage projects.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 491CIS-3 | Project-I | 4 (0, 8, 0) | 342CIS-3 |

**Course Description:**

The previous courses have provided the IS students with strong and sufficient knowledge to develop information systems. The next logical stage is that the IS student must acquire hands-on experiences on developing real world information systems. In addition, the students should be familiarized with real world problems encounter during the development of real world information systems. Furthermore, the students should be trained to work in teams. In this course, the students will be organized into groups. The number of students in each group should not exceed three students. In developing an information system, a particular information system development methodology should be used. Each group will develop a real world information system in two stages: The first stage will be carried out in IS 496. In IS 496, the students of each group must identify a problem domain, define a problem, identify the requirements in details, specify requirements in details, analyze and document the current system, proposed alternative systems, and design a particular system in details which includes the definitions of all the required system models such as the data model and the functional model. At the end of the course, each group must submit a formal report documenting the problem domain, the problem, the requirements, the specifications, and the system models.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 410CIS-3 | Information System Policies and Strategies | 3 (3, 0, 0) |  |

**Course Description:**

This course provides an understanding of the use of information technology from an organizational perspective by focusing on the development of IT policies and plans to achieve organizational goals. Topics include the strategic uses of IT, translating IT objectives into operating principles, IT architecture and infrastructure, software development management, organizational change, outsourcing, governance, risk management, and performance measurement.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 420CIS-3 | ICT Networks Administration | 3 (2, 2, 1) | 370CIS-3 |

**Course Description:**

Introduction, Overview of Network operating system, Setting up a Network Server, Setting up Network Clients, Network Design Issues, Network Client Administration, Workgroup and Domain Concepts. System Administration Basics, Network Services, Monitoring and Logging of various Operating System Events, Security Applications and General System Events, Monitoring Wide Variety of System Objects, Diagnosing and Troubleshooting Hardware, System Configuration including Screen Display, Network Services, Protocols, Servers, Services and System devices, User and Group Management and Services used to manage User Access to Resources, Remote Administration, Management of Key Processes, Network Services Administration including e-mail, Internet, Web and FTP, Firewall Administration, Controlling Access to the Machines.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 430CIS-3 | Electronic Business | 3(2, 2, 1) |  |

**Course Description:**

This course begins with the historical review and current applications of the World Wide Web (WWW) and the Internet. WWW and Internet technology infrastructure : languages, hardware web, server platforms, various software tools, and protocols used to develop web-based applications adopted by profit and nonprofit organizations throughout the world. E-business models: business-to-business, and business-to consumer, etc... E-business applications: e-government, e-commerce, e-payment, mobile commerce, e-banking, e-jobs, e-learning, e-advertisement, etc.. E-business management: e-business projects management, risk management in e-business, e-commerce and supply chain management, e-commerce and customer asset management, etc.. Strategic trends in developing e-business systems: Web-based marketing strategies and models, public policies and legal issues of privacy, security issues, steps necessary for an enterprise to formulate an overall e-business strategy.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 440CIS-3 | Multimedia Technologies | 3 (2, 2, 1) |  |

**Course Description:**

Introduction, Images and Graphics, Video, Animation, Audio, Audio Speech, Compression, Optical Memory Media, Programming, Resources and Quality of Service, Media Server, Documents, Semantics (Ontology and Metadata), Synchronization, Design, Application, Learning, and User Interfaces.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 337CIS-3 | Database Management Systems Administration | 3(2, 2, 1) | 230CIS-3 |

**Course Description:**

This course covers the following topics: Selection of DBMS, Architecture of the chosen DBMS, Installation issues, DB creation, Indexing, Integrity Constraints triggers and assertions, DB Backups, Security management, Recovery issues, Performance management and tuning. Other features of the DBMS: Integration with web technologies, DB connectivity tools, Data distribution, fragmentation, and replication issues, Management issues of the DBA activity.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 492CIS-4 | Project 2 | 4 (0, 8, 0) | 491CIS-4 |

**Course Description:**

In this course, each group will continue developing the information systems that started in IS 496. Groups must use particular tools to implement their information systems in a good programming practice. These implementation tools must be new and the students have not been experienced in the previous courses. Furthermore, students must generate user manuals for their information systems in an appropriate format. At the end of the term, each group must submit a final report, which documents completely the information system, from the problem definition phase to the implementation phase, and contains a user manual for the information system.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 446CIS-4 | Internet Applications Development | 4 (3, 2, 1) |  |

**Course Description:**

This course explores advanced and modern concepts and technologies used in the development of electronic business applications. Topics include component development and reuse, distributed object technologies, multi-tier applications, client-side versus server-side technologies, service-oriented architectures, enterprise application integration, data transformation, role of open-source technologies, and finally e-business application installation and deployment issues.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 450CIS-3 | Decisions Support Systems | 3(2, 2, 1) |  |

**Course Description:**

This course covers the following topics: the decision making process, decision making and support systems (DSS), modeling and support, categorization of problem-solving techniques, data management and concepts of the data warehousing, modeling of management problems; linear programming models, simulation models, and heuristics and forecasting models, model-base management systems, DSS user interface design and management, decision support system construction methods, DSS hardware, software, and technology Levels, knowledge-based systems and expert systems, expert system architecture, representation of knowledge, forward and backward chaining, inferences making process, applications of expert systems in decision making, group, distributed, and executive decision support systems.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 460CIS-3 | Information Systems Security Administration | 3 (2, 2, 1) | 370CIS-3 |

**Course Description:**

Security fundamentals, policies, procedures, and mechanisms.  Identification, authentication models, access control models. Data models, concepts and mechanisms for software, hardware, operating system and database security. Basic cryptography (symmetric and asymmetric) and its applications. Security in computer networks and distributed systems. Attacks types and how to prevent them. Prevention and control of viruses and other rogue programs. In addition, the basics of physical security, incidence response, disaster recovery, business continuity, and forensics.

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| Course Code | Course Name | Credit Hours | Prerequisite |
| 470CIS-3 | Geographic Information Systems | 3 (3, 0, 1) |  |

**Course Description:**

We begin by introducing the use of GIS, explain the use of current software & hardware. How to use the real-world geographical data (Spatial) sets and understanding of GIS data sets. Then student will learn how to analyze the GIS data. Student will be able to solve problems using GIS. In the lab students will practice adding elements to maps using GIS software.