Program Accreditation Eligibility Requirements (4)

Student and Staff Manuals

4.1 Program Handbook

DEPARTMENT OF COMPUTER SCIENCE

DEAN'S MESSAGE

Praise be to Allah alone and blessing and peace be upon his prophet, Mohammed bin Abdullah, and upon his family and companions

People at all levels have become aware of the significance of computers and information technology feeling the great leap that the computer has brought to civilization. In just a few years, most people in the Kingdom have become aware of the Internet and its networks, where hundreds of millions of computers across the world is connected. It has become the means of communicating and transmitting information between the vast and rapidly expanding parts of the world. There is no doubt that this information contains various contents that contribute in shaping human culture and play a vital rule in running the cultural civilization of societies.

In view of the above, The College of Computer Science and Information Systems was launched from early days of establishing Najran University.

Dean of the College of Computer Science and Information Systems
Dr. Abdullah Ali Alabas

MESSAGE OF THE VICE DEAN FOR ACADEMIC AFFAIRS

Praise be to Allah alone and blessing and peace be upon his prophet, Mohammed bin Abdullah, and upon his family and companions.

It is my great pleasure and honor to welcome you in the college Vice-Deanship for Academic Affairs website at the college of Computer Science and Information System. The college Vice-Deanship seeks to supervise students' educational process, through its committees and units. Moreover, the college Vice-Deanship works to overcome students' obstacles by activating the Academic advising unit and help students to solve problems related to their schedules and courses etc.

Due to the rapid changes in the various fields of technology and the need for the continuous improvement the college Vice-Deanship is keen to keep updated with the rapid changes in the field by continue improving the current programs in the college.

Vice Dean for Academic Affairs
Dr. Hani Mohammed Alskaini Alshahrani

MESSAGE OF THE VICE DEAN FOR FEMALE SECTION

Praise be to Allah alone and blessing and peace be upon his prophet, Mohammed bin Abdullah, and upon his family and companions

I am pleased to meet you on the website of the Vice-Deanship for Development and Quality at the College of Computer Science and Information System (CCSIS) at Najran University. The Vice-Deanship seeks to spread the culture of development and quality and to ensure that NCAAA and ABEAT standards are met for all college programs. Therefore, the College of Computer Science and Information Systems at Najran University is considered as one of the distinguished colleges at Najran University in terms of its academic programs educational quality.

The College has proudly adopted the concepts of quality assurance and continuous improvement in the learning outcomes and teaching practices to achieve its noble mission. Currently, programs of Computer Science and Information Systems are working towards obtaining the accreditation from the National Center for Academic Accreditation and Assessment (NCAAA), as well as from the International Accreditation Board for Engineering and Technology (ABET).

We are pleased to receive any constructive suggestions regarding to the development and quality process.

Vice-Dean for Development and Quality
Dr. Mohammed Ali Hamdi

MESSAGE OF THE VICE DEAN FOR FEMALE SECTION

The rapid growth in the field of computing and Information Technology increased the importance of this area of study. World is now called global village where technological developments are advancing so rapidly and Knowledge transfer and information sharing requires advanced and compatible institutes and knowledge houses.

This college provides a big opportunity for the students of Najran, Saudi Arabia to acquire the technological knowledge in relation to world advancement in the field of computing & technology. Our aim is to produce future computer researchers, project leaders, problem solvers and well behaved citizens of this global community.

Our college is not only giving the theoretical knowledge but also enriches the student's personal, social and cognitive skills. We provide an effective blend of theory and practice that enables students to continue to advance their knowledge after graduating from the college. We offer the best atmosphere at the college having Computer Labs equipped with the latest technological resources along with specialized and experienced faculty.

Vice Dean for Female Section
Dr. Hanan Halawani

The College of Computer Science and Information Systems at Najran University was established in 1427H starting with only two department: the Department of Computer Science and Information Systems. In a few years, the College expanded its number of programs in the field of computer and information technology to participate in building a strong local industry market, to keep up-to-date of technological developments, and to meet the requirements of higher education in our country.

The Computer Science and Information Systems field is considered one of the modern and renewable specialties. It plays an important in building modern societies with strong economies and can help in advancing the country rank placing it among the industrialized and technical countries of the 21st century. Furthermore, it is one of the most innovative and fast-changing scientific fields that assists professionals to be familiar with ever changing technical information.

Acting diligently based on motivations mentioned above, the College of Computer Science and Information Systems at Najran University seeks to place the College among the leading colleges in the Kingdom of Saudi Arabia. Doing so can only be achieved by its active contribution in providing graduates with high academic capabilities in the fields of computer science and information systems. The College works to equip its graduates with adequate and appropriate information that help them pursue distinguished positions in organization related to specialization. They also continue developing their knowledge to keep up with developments in the field as well as in the fields of scientific research. The College is also working toward reaching outstanding scientific research that support the priorities of the Kingdom in terms of scientific, industrial and economic fields as well as raising the artistic level of the technical community in the field of computer science.

The College of Computer Science and Information Systems has two active main departments: the Department of Computer Science and the Department of Information Systems. Moreover, there are two other departments in the process of establishment and students will soon can join them.

كلية علوم الحاسب ونظم المعلومات
COLLEGE OF COMPUTER SCIENCE AND INFORMATION SYSTEMS

COLLEGE'S VISION, MISSION AND OBJECTIVES

COLLEGE'S VISION

Leadership in computing education and researches and effective contribution to community development.

COLLEGE'S 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.

INTERIM HEAD OF THE DEPARTMENT MESSAGE

The Department of Computer Science has succeeded in graduating skillfully and scientifically qualified male and female students with satisfactory competence in various fields of computer in the labor market.

The Department of Computer Science includes elite faculty, lecturers and teaching assistants, who have devoted their efforts to elevate the level of the Department on a national and a global scale since the establishment of the university.

Besides, the Department is keen to achieve the academic quality and continual development of the learning process according to the global standards, depending on intensive efforts of the staff of the department, seeking to obtain academic accreditation for a program of Computer Science either at a national level (NCAAA) or an international level (ABET).

Interim Head of Department
Dr. Hani Mohammed Alshahrani

ASSISTANT HEAD OF THE DEPARTMENT MESSAGE

Welcome to our website in the Computer Science Department.

On behalf of our amazing faculty members in the CS department, I would like to express my warm welcome to all visitors. This website contains all the news and progress that the CS department has been doing. It includes documents about the CS department undergraduate programs, study plans, students' activities, academics and quality work.

I have been very lucky to be part of the CS faculty members who are specialized in various important fields in Computer Science such as Artificial Intelligence, Cybersecurity and other areas in new technologies. I am enjoying my teaching experience in the CS department with students which is supported by my brilliant colleagues. The CS department provides me always a healthy environment for growth in education, science and research.

We all in the department of Computer Science in Najran University are continuing our efforts and progress toward the 2030 Vision in Saudi Arabia. The CS department ensures to provide high quality education for students with the best criteria and standards such as the National Commission for Academic Accreditation and Assessment.

Assistant Head of Department
Dr. Yousef Abdullah Asiri

The Computer Science department of the College of computer science and information systems at Najran University was established on the eve of 2007 to meet the high demand of the market and keep abreast of current technological developments. Currently the department offers program in computer science. The Computer Science program aims to prepare students to become specialists in this vital area and award students a bachelor degree in computer science. The degree title for those students who satisfactorily complete the program is the bachelor of Computer Science. This is the only Bachelor degree offered by the program. The study plans of the computer science program has been very carefully framed to address the most recent development, and attention is dually given to both theory and practice.

To account for the dynamic growth in the local market as well as the international advancements in the information resources fields, the Computer Science department has endeavored to assure the quality of its academic program by taking a number of major decisions. In this respect, the department established a quality assurance unit which works cooperatively with the university rectorship of development and quality to establish and disseminate quality culture and practices in every aspects of academic programs. In a major step, the department has initiated ambitious goals to obtain academic accreditation for its academic programs form the National Commission for Assessment and Academic Accreditation and the worldwide recognized Accreditation Board for Engineering and Technology.

Motivated by the university and college missions, the department funds research projects and active research groups that are contributing quality research. These research groups have set and defined objectives to conduct research on various domains that includes data mining and artificial intelligence, software engineering, knowledge management, intelligent systems and robotics. Moreover, the department has provide excellent infrastructure in the form of building and space, library, computing facility with the help of a huge number of latest generation computers in a number of PC Labs, very fast accessible networks.

The college of computer science and information systems understands that it should cope with the rapid and continuous development in the Kingdom of Saudi Arabia in the last twenty years in the field of higher education and academic institutions. It also understands the importance of coping with the industry for both public and private sectors' demand in many areas and scientific disciplines (e.g. information technology). Therefore, the college forms an advisory board for each academic program in the college

to get the valuable opinions of the community. Furthermore, the faculty members are always ready to provide valuable information to the community through meetings, discussions, workshops, orientation programs and newspaper articles.

Computer Science Program is considered as modern and renewable specialization. Computer Science is one of the important disciplines necessary to build modern societies with strong economies that put the state in the ranks of the industrially and technically advanced in the twenty-first century. Computer Science Program is updated regularly to suit the spirit of the recent changes and new skills.

Mission of Computer Science Program

To provide quality education through a well-designed computer science curriculum that equips students with the requisite knowledge and interpersonal skills.

Goals of Computer Science Program

- To enhance students computing capabilities by acquiring fundamental knowledge and concepts of computer science.
- To prepare students for job market by strengthening their project design and implementation skills.
- To foster students professional skills by promoting team work and ethical responsibility.
- To encourage students for continuously attaining knowledge of computer science through higher education and emerging new technologies.

Computer Science Program Learning Outcomes

Knowledge:	
PLO code	PLO description
K1	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
K2	An understanding of professional, ethical, legal, security and social issues and responsibilities
K3	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
Skills	
PLO code	PLO description
S1	An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
S2	An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
S3	An ability to analyze the local and global impact of computing on individuals, organizations, and society
S4	An ability to use current techniques, skills, and tools necessary for computing practice.
S5	An ability to apply design and development principles in the construction of software systems of varying complexity.
Competences	
PLO code	PLO description
C1	An ability to function effectively on teams to accomplish a common goal
C2	An ability to communicate effectively with a range of audiences
C3	Recognition of the need for and an ability to engage in continuing professional development

Graduate Attributes:

Our graduates will
- be familiar with professional responsibilities and global impact in computing field based on legal, ethical, security and social principles.
- be proficient in applying critical thinking, problem-solving, and programming skills in real-world contexts.
- be equipped to seek knowledge and to continue learning throughout their lives.
- be able to work and communicate effectively as an individual and as a member or leader of a team in a variety of professional contexts.

DEPARTMENT COUNCIL

The Computer Science Department council members are:

1	Dr. Hani Mohammed Alshahrani	Interim Head
2.	Dr. Yousef Abdullah Asiri	Assistant Head & Secretary
2	Dr. Khiran Dbash Rajab	Member
3	Dr. Anwar Ali	Member
4	Dr. Adel Al Sulaiman	Member
5	Dr. Adel Dabash Rjab	Member
6	Dr. Mohammed Hamdi	Member
7	Dr. Aisha Mashraqi	Member
8	Dr. Hanan Halawani	Member
9	Dr. Samar Alqahtani	Member
10	Dr. Aisha Mashraqi	Member
11	Dr. Sultan Almaki	Member
12	Dr. Saeed Alahmari	Member

The Department Council meets at least once every two weeks on the request of the Head of the Department. During the academic The department council meets to discuss various academic and administrative issues.

FACULTY

No.	Faculty Name	Academic Title
1	Dr. Hani Mohammd Alshahrani	Assistant Professor
2	Dr. Khairan D. Rajab	Associate Professor
3	Dr. Adel Dabash A. Rajab	Assistant Professor
4	Dr. Mohammed Hamdi	Assistant Professor
5	Dr. Yosef Abdullah Asiri	Assistant Professor
6	Dr. Sultan AlMakdi	Assistant Professor
7	Dr. Anwar Ali Yahya Esmail	Associate Professor
8	Dr. Adel Sulaiman	Assistant Professor
9	Dr. Saeed Alahmari	Assistant Professor
10	Dr. Samar Alqhtani	Assistant Professor
11	Dr. Aisha Mashraqi	Assistant Professor
12	Dr. Hanan Talal. Halawani	Assistant Professor
13	Mr. Adaln Balola Ali Alhokri	Lecturer
14	Mr. Muhammad Akram	Lecturer
15	Mr. Usaid Alibrahem	Lecturer
16	Mr. Ahmad Mohammad Almasabi	Lecturer
17	Ms. Maha Alwuthaynani	Lecturer
18	Ms. Eman Abdelkreem H. Altahir	Lecturer
19	Ms. Nyla Khadam	Lecturer
20	Ms. Raniah Zaheer	Lecturer
21	Ms. Saira Banu Mohammed Rasool	Lecturer
22	Ms. Somaya Alhazmi	Lecturer
23	Mrs. Soad Mohammed Almula	Lecturer
24	Mr. Ibrahim Hassan Alyami	Lecturer
25	Ms. Amal Saeed ALJarah	Teaching Assistant
26	Morady Mohammed	Teaching Assistant
27	Sahar Saeed ALJarah	Teaching Assistant
28	Zahra Alwadie	Teaching Assistant

STRUCTURE OF COMPUTER SCIENCE
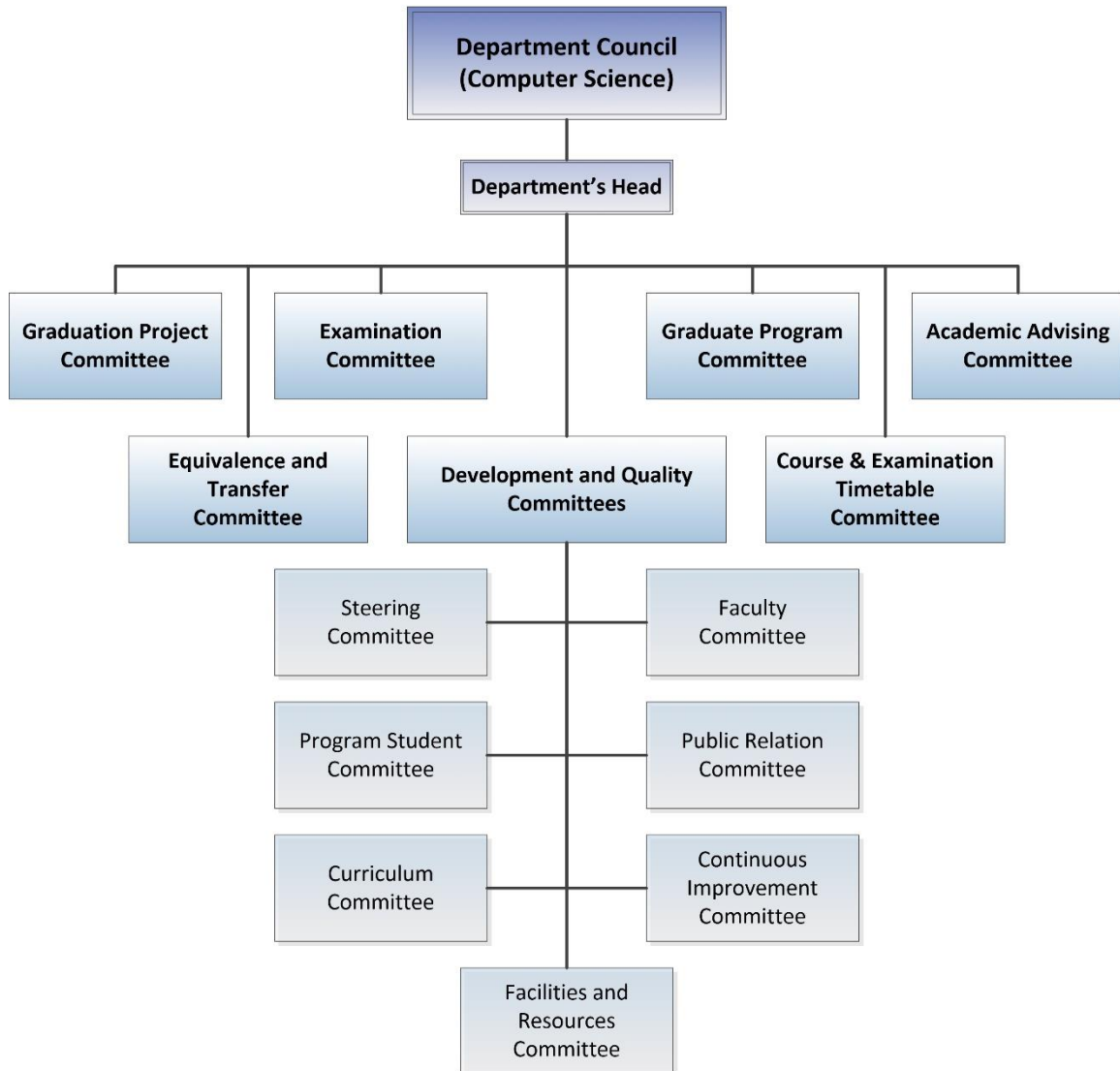
The Computer Science department council has decided in its meeting to reform the current working committees in the department and form additional new committee to improve the performance of faculty members in achieving the department objectives. Each committee has specific tasks and in every semester, it must submit working plan, progress reports and final performance report to the department. The following Table shows the current working committees in the department with their specifications.

No.	Name	Head	Coordinators	Tasks
1	Publicity Committee			• Gather, organize, and publish news about department activities on department websites. • Prepare and print brochures, manuals, handbooks ··· etc. • Update departments websites • Coordinates with college and departments website committees • Prepare and submit final performance report to the department
2	Examination Committee			• Organize an supervise all activities related to examinations (midterms and final) in the department • Prepare examination budget • Prepare and submit final performance report to the department
3	Student advising committee			• facilitate academic advising for the current student • Organize meeting with the new students intakes • Prepare and submit final performance report to the department
4	Suggestions and complaints committee			• Study and follow up students suggestions • Deal with students complaints and take the necessary actions

				• Prepare and submit final performance report to the department
5	Students activities committee			• Organize all students activities • Coordinate students activities with the deanship of students affairs • Prepare budget of students activities • Prepare and submit final performance report to the department
6	Development and quality committee			• Organize and supervise all department activities in development and academic accreditation • Coordinate with college unit of development and quality • Train new faculty member in various academic activities • Prepare and submit final performance report to the department
7	Translation and documentation committee			• Translate and update the content of the department English website • Translate department council resolutions • Translate department reports • Prepare and submit final performance report to the department
8	Timetable committee			• Prepare timetable for all courses and faculty members • Submit lecturers teaching loads to the head of the department • Coordinate with the lecturers from other colleges • Prepare and submit final performance report to the department
9	Operational plan committee			• Improve the quality of the programs • Improve the academic advising system

				• Promote scientific research • Activate department working committee • Prepare and submit final performance report to the department
10	Lab and facilities committee			• Supervise all lab related to the lab and • Prepare and submit final performance report to the department
11	Equivalency committee			• Handel all equivalency requests • Prepare and submit final performance report to the department
12	Teaching assistant and scholars committee			• Handel all equivalency requests • Prepare and submit final performance report to the department
13	Library and periodical committee			• Supervise all tasks related to the library • Prepare and submit final performance report to the department
14	External courses committee			• Coordinate the course delivered by lectured from other colleges • Prepare and submit final performance report to the department
15	Electronic Website committee			• Update and organize the contents of the department website • Prepare and submit final performance report to the department
16	Seminars and workshops committee			• Coordinate seminars and workshops • Prepare and submit final performance report to the department
17	Community service committee			• Supervise all activities related to the community • Prepare and submit final performance report to the department

18	Alumni committee			• Maintain the communication between the departments and its graduates • Prepare and submit final performance report to the department

EDUCATION SYSTEM

The College follows the semester system. Two semesters are offered in each academic year (each semester is called a level). The duration of each semester is fourteen weeks excluding examination, in addition to an optional 8-weeks summer semester.

STUDENTS ADMISSION

Students who want to be admitted in The Department of Computer Science, Najran University, should satisfy the following requirements:

1. 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. For all the other specializations, the average shall be calculated as follows: 30% aptitude and 70% general secondary.

2. The student should have obtained the general secondary certificate or its equivalent from the Kingdom or abroad.

3. No more than two academic years should have elapsed from the date of his/her obtaining such certificate or its equivalent.

4. The student should have a good conduct and proper behavior.

5. The student should successfully pass any exam or personal interview (if found).

6. The student should be medically fit.

7. The student should obtain approval from his authority to pursue his/her studies, if s/he works for any governmental or private body.

8. The student should not have been expelled from Najran University or any other university for academic or disciplinary reasons.

9. After the student is admitted, if it is turns out that he/she has already been expelled for disciplinary or academic reasons, his/her admission shall be considered as void.

10. The student meeting the requirements should present the documents stipulated by the Deanship of Admission and Registration at the University.

11. 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.

12. Files of students who are late for admission tests (if found) shall be ruled out.

13. Files of students who are late for personal interviews (if found) and do not present an acceptable excuse shall be ruled out.

14. Students who are late in carrying out the admission procedures within the deadline set by the University, and who do not present an excuse acceptable by the Deanship of Admission and Registration shall have cancelled their admission.

Student Admission and Registration for Computer Science Program (CS) is performed electronically through EDUGATE, supervised by the Deanship of Admissions and Registration by the law of the University. All admission information is described publicly in a clear and understandable way on the program websites, including the requirements, policies and procedures.

Students are entitled to register courses electronically through EDUGATE. before the beginning of each semester according to their study plan. Also, all most all faculty members of our CS program play a vital role as an academic advisor to support students during their course registration process and are supervised by College's Academic Advising Unit.

Rules governing admission with credit for previous studies are clearly specified in the student handbook which is developed for CS program and complete information about the program, including the range of courses, program requirements, services and other relevant information is made publicly available to potential students and families prior to applications for admission through program website. At the beginning of each semester, the College arranges a comprehensive orientation program for prospective students to ensure thorough understanding of program requirements, the range of services and facilities available for them, and about their code of conduct & responsibilities.

RULES AND REGULATIONS FOR COURSES' REGISTRATION

The student is automatically registered at the beginning of each semester for a number of units according to his academic standing. Students with lower GPA are eligible to register up to 12 units, while those of higher GPA are eligible for up to 18 units as maximum.

DROPPING AND ADDING OF A COURSE

The Processes of dropping and adding are performed by the student electronically in the first week of the semester through accessing the academic system of the University Deanship of Admission and Registration:

https://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 F grades that are zero grades for those courses.

EXAMINATION AND GRADING SYSTEMS

Examination assessment or evaluation system is based on the theoretical and practical exams and homework, exercises, projects and any other scientific activities. Full marks for each course of the curricula for computer science are equal to100 (hundred) points and is divided into two main sections, namely: course work and final examination.

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

2. Final exam grade:

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

The pass mark in each course is 60%.

Exam evaluation system at the college is mentioned on the following tables:

Course (Without lab)

Assessment Process	Class test	Assignment/Project	Midterms	Final	Total
Maximum points	10%	10%	30%	50%	100%

Course (With lab)

Assessment Process	Class test	Midterms	Lab	Final	Total
Maximum points	06%	24%	20%	50%	100%

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:

$$\text{GPA} = \frac{\text{Total Points (Item 1)}}{\text{Numbers of Hours registers in the semester (Item 2)}}$$

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 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 students' CGPA.[(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 1st semester student got 32 total grade points for 11 credits, and in 2nd student got 39 total grade points for 14 credits, the CGPA of 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

Restrictions of the Final Examination

No student will be allowed to sit for a final examination after the lapse of 30 minutes from the beginning of the examination. Also, no student will be allowed to leave the examination venue less than 30 minutes after the beginning of the examination.

TRANSFER STUDENTS AND TRANSFER COURSES

Internal transfer in college of Computer Science and Information Systems:

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

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

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)

Transfer Rules from Other Colleges

- Transfer from any theoretical College to College of Computer Science is not allowed.
- Transfer from Colleges that do not require Preparatory year is not al-lowed. 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 to/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 transfer to other/national universities. Therefore, the College of Computer Science and Information Systems have successfully implemented the transfer program of the students.

UNDERGRADUATE PROJECT

Independent study course whereby a group of students (3 to 4) at level seven selects one of the proposals submitted by department faculty members with a timeline and evidence of research and analysis, meets with an advisor and co-adviser throughout the semester and then provides a final report regarding system requirement, analysis, and design and makes a formal presentation. In the next semester at level eight every group develops, simulates, implements, and tests software, database through the semester and then provides a final report, presents software, and makes a formal presentation.

The major intended learning outcomes of the project or research task:

1) Development of skills in planning, analyzing, designing, and carrying out a major research project.

2) Development of practical skills of using various computer software, programs, programming languages, databases and implement in professional life

3) Improvement of analytical, writing, and communicative skills

4) Improvement of skills in effective time management

5) Improvement in ability to operate as a team member in a significant project

6) Improvement in ability to think critically, research in various aspects

7) Improvement in ability to respect social, ethical, and moral issues

STUDENTS' ACADEMIC ADVISING UNIT

Academic Advising Unit (AAU) of CS program governs by the College of CSIS aimed to provide absolute guidance to the students through efficacious counselling regarding students' academic and personal difficulties. This service is currently internally to academic concerns. Students are formed in a group according to their student ID and each group has been assigned to an academic advisor to ensure that all students get academic counselling throughout the program. All most all faculty members of the program are playing a role as an academic advisor as a part of their job responsibilities by following the guidelines set by academic advising unit and being monitored by the

coordinator of this unit. At present, separate time for student advising in academic advisors' time table has been implemented and 4 hours have been allotted during the week for Academic advisors to schedule. Each newly enrolled student is encouraged to meet his/her academic advisor and open a student file which should be kept and maintained by academic advisor as record. This file should reflect student progress mainly concerning on student's results. Academic advisors write a summary report on each student progress and based on this progress report, at the end of each semester, academic advisors produce a subject plan for the coming semester for each advisee student. After preparing a subject plan for a student, academic advisors are accountable to forward this plan to the academic advising unit and in parallel consult with the student about the proposed subject plan the graduating/higher level (level 7,8,9) students depending on the student's' necessity. For our along with their expected graduation time frame (part of their program plan). Counselling on career planning take place mostly for the graduating/higher level (level 7, 8, and 9) students depending on the Students' necessity. For this program, Students' academic appeals are mainly categorized by the form of '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 units by an adopted mechanism. Each student is accountable to place an appeal through his/her academic advisor using case specific appeal form. All appeal forms are available on the university's website from where student can fetch. These forms are also available with academic advisors. Academic advisors are accountable to consult with the student in detail to spot students' need and provide guidance to fill out the appeal form. During this consultation process, academic advisors are responsible to fetch necessary record from corresponding student file to support his/her opinion.

In the end, Student Advising and Counselling services of our program currently internally to academic concerns. At present, we do not have facilities to provide counselling regarding students psychological/health problems, financial matters and family problems, but we can transfer them to Deanship of Student Affairs.

Students Distribution Mechanism:

 The Academic Unit distributes the list of students at the beginning of each academic year or semester wisely to academic advisors so that each advisor has a less than or equal twenty students. It conducts a meeting in the first week of each academic year/semester with new students and transferees to provide them with the necessary information for undergraduate study.

In addition, it introduces all students with their advisors and explains the responsibilities of advisors and advisees. Then it opens a file for each student with his advisor. Besides, it provides all students' documents (academic transcripts, timetable, and marks) to the advisors to follow-up students. Ultimately, the advisor will follow-up service required by the student, and find out the appropriate response to it.

Faculty members are assigned students majoring in their field of expertise and are trained in counselling students regarding program requirements. Student meets with academic advisor either in the group or individually at any time throughout the semester. Advisor has no more than 10 students to advice for the independent study

Advisors major responsibilities are:

1) To make individual student file and keep students records

2) To offer courses for regular and summer semesters

3) To manage students' sick leaves

4) To handle excuses during semester

5) To keep the records of internal, midterms, lab, and final exams' marks

6) To declare marks of internal, and midterms to the students

7) To manage departmental procedures if any student wants to take summer courses in any other universities within the kingdom

8) To monitor students' academic and moral progress

9) To advice the students about program planning and career planning

Complaints and Appeals System:

Computer Science program adopted effective policies and regulations to establish fair and consistent processes of student study, with effective safeguards for independent consideration of complaints and appeals

Student appeal and complaint procedures are specified in regulations and made widely known at the time of orientation. The College of CSIS developed different case specific academic appeal templates to make clear ground of academic appeals.

Procedure to Handle Students' Complaints

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

1. 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.

2. 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. The committee passes the complaints (if any) to the college council for further actions. The Complaint Handling Committee consists of 5 members as follows:

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

3. 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.

Procedure to Handle Students' Appeals

Students' academic appeals are mainly categorized by the form of '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 units by an adopted mechanism. Each student is accountable to place an appeal through his/her academic advisor using case specific appeal form. All appeal forms are available on the university's website from where student can fetch. These forms are also available with academic advisors. Academic advisors are accountable to consult with the student in detail to spot students' need and provide guidance to fill out the appeal form. During this consultation process, academic advisors are responsible to fetch necessary record from corresponding student file to support his/her opinion.

When an appeal has been finalized and submitted by the student, academic advisors are accountable to attach necessary supporting documents such as student's transcript, medical excuses, add/drop form etc with this appeal and forward this appeal to the academic advising unit through the University's correspondence 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 university's regulations, college rules and program requirements. If an appeal complies with all requirements, it has been carrying forwarded to the decision making authority (Dean of the college), else it has been returned to the correspondent academic advisor.

The decision making authority provides decision on the majority appeal cases by 7 days that appear in different places/format depending on the nature of the appeal. All the appeals are automated and hence it facilitates the Advisee student to send their appeals through the system and this has been implemented from the second semester, 2018-19.

Successful appeal for rechecking of exam is forwarded to the college coordinator. College coordinator is accountable to form an evaluation committee and send the review request to that committee. The evaluation committee should consist of at least

3 people (i.e. Program coordinator, subject coordinator, member of that subject's knowledge group) and is accountable to provide the outcome within 3 days.

STUDENTS' ACTIVITIES UNIT

The objective of Students Activities Unit in college of Computer Sciences and Information Systems is to help students improve their skills, raise their knowledge level, and enhance students' personality. Students have always the power and passion to learn new things and because of that activities unit has existed. The unit provides students with what they need in order to develop their abilities. The unit also work to find students with different hobbies and try preserving these hobbies by conducting activities. Another main goal of Students Activities Unit is to create and spread a mindset of the active student in the college which can benefit not only students but also college.

STUDENT RECORDS

Najran University adopted fully automated system that inherits well defined regulations to keep up student records. This automated system is centrally organized and operated by University's 'Student Record and Registration Department'. Computer science (CS) program is also abided by that automated system. This student record 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 relation to program and course requirements.

STUDENT MANAGEMENT

Computer Science Program adopted 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 & enforced using automatic student attendance system. Student appeal and complaint procedures are

specified in regulations, published and made widely known at the time of orientation. The college of CSIS developed different case specific academic appeal templates to make clear ground of academic appeals. These appeal and complaint procedures protect against time wasting on trivial issues, but still provide adequate opportunity 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, or who made a decision or imposed a 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 CS program, appropriate policies and procedures are in place to deal with academic misconduct, including plagiarism and other forms of cheating.

COLLEGE LEARNING FACILITIES

To serve all the departments of the College of computer science and information systems, the College contains a number of computer laboratories, namely: programming lab, database lab, assembly language lab, UNIX lab, artificial intelligence lab, computer graphics lab, networks lab, open lab, and digital lab. The College's physical facilities include:

1) Lecture halls

2) Computer laboratories

3) Digital laboratory

4) Seminar room

5) Open lab

PROGRAM EVALUATION AND REVIEW

The main objective of the evaluation and review processes is to evaluate the quality of the CS program. More specifically, all aspects that affect the program (e.g. learning outcomes, facilities and resources, teaching strategies, etc.) are reviewed and assessed to improve the quality of the program, to show responsibility to the general community and to prospective students. The evaluation and review processes are designed to ensure that a sustainable and efficient continuous improvement system is applied to meet the following additional goals:

- To monitor the mission and objectives of the program.
- To foster academic excellence.
- To determine the weaknesses and strengths of all aspects related (e.g. academic, community service and research) to the program.
- To define how to improve the quality of the program.
- To ensure rigor implementation of actions in order to improve the program.
- To improve teaching strategies and other educational practices.
- To check and improve the extent to which each learning outcomes at various levels are being attained.
- To monitor and improve academic support and services provided to students.
- To check that resources and facilities are available and used effectively.
- To provide and improve direction related to administrative decisions on issues related to financial planning and employment processes.
- To maintain internal and external benchmarking and determine how the quality of the program has been improved.
- To obtain national and international accreditations (NCAAA and ABET).

The program is reviewed internally and externally through several assessment methods. The internal review system of the program includes the following:

1. Annual Program Report: The NCAAA annual report template is filled out every year and covers all issues related to the program. This report includes evaluation of learning outcomes and a general evaluation of the program using surveys. The information on enrolment of students, completion rates, records of student completion rates in all courses, and grades distributions are used quality indicators.

2. Curriculum Committee Report About Courses: By the end of each semester, the curriculum committee (CC) reviews all courses' reports (NCAAA format) and prepare a report that contains three sections 1) recommendations to be implemented at the program level 2)recommendations to be implemented for all courses 3) recommendations at specific course level. The recommendations are discussed by the program council and implemented and followed-up.

3. Exit Survey: This survey is filled-up by all students at the time of graduation. Specifically, this survey is given to them before they can make the final presentation of their Graduation Project II (492CSS-4). The purpose of this survey is to measure if the performance indicators for each student outcomes meet the required level of achievement (65% agree or strongly agree) or not. The exit survey explicitly addresses the SOs in terms of their PIs. The exit survey consists of several sections that allow students to give their opinions in advising, learning resources, professional preparation, teaching strategies and educational practices. They also can write comments about the program overall and suggest improvements.

4. University Online Course Survey: By the end of the semester, the quality of the courses is evaluated from the students' perspectives. This survey includes several sections such as 1) content of the course, 2) teaching strategies 3) assessment methods, 4) text books and 5) lecture materials etc. Students overall rating on the quality of their courses is discussed with all faculty members and improvement plan is prepared if needed.

5.Current Student Survey: The program adopted the NCAAA current student survey. This survey is distributed to students once a year. Moreover, this survey   is used to take the opinions of students about issues such as 1) Academic Advising and Support provided to students, 2) Learning Resources and Equipment 3) Learning and Teaching 4) learning outcomes and 5) overall quality of the program.

6. NCAAA Course Reports: By the end of each semester, each instructor must submit the course report (NCAAA) that contains assessment of Course Learning Outcomes (CLOs) as well as improvement plan based on CLOs assessment. Improvement plan might be related to several aspects in the program such as facilities, teaching strategies, content of the course, etc.

7. Facilities and Resources Survey: This survey is conducted once a year to take the opinions of faculty members regarding the allocation of facilities and resources and their appropriateness and effectiveness. The Faculty and Resources Committee (FRC) are responsible for this survey.

8. Alumni and Employer Surveys: The alumni and employer surveys contain questions and feedback boxes to assess the achievement and the importance of the current Program.

9. Program Advisory Committee (PAC) Meeting and Survey: the chair of the department meets every year with the PAC to know whether the current SOs meet the needs of the labor market. PAC evaluates the importance of learning outcomes through survey and ensures that the outcomes are still in-line with the dynamic needs of the industry. In addition, PAC must be involved of any changes to improve the program.

10. Program Administration Survey: This survey is to take the opinion of faculty members about the administration of the program.

11. Questionnaire about the Internal Quality Assurance System: This questionnaire is conducted every year to evaluate the performance of the quality assurance systems in the college.

12. Text Book Evaluation and Availability Form: This form is filled out by all faculty member every semester to evaluate the relevancy of text books and references materials to the academic fields.

13. Evaluation Mechanisms: For each one of the NCAAA standards (6 standards), a set of evaluation mechanisms were developed and used to evaluate the results of the corresponding KPIs and the quality of relevant practices. Mechanisms to evaluate KPIs and standards include data about : when data are collected (e.g. Once a Year), responsible people to collect and evaluate the data (DQU and DSC and CC), Targeted group (Alumni), Assessment methods (Alumni survey), purpose of the mechanism and target (KPI).

Several committees and units are involved in the organization of surveys, data collections, and analysis of results. The DQU and DSC monitor the progress of other committees and ensure that review processes are implemented as planned. The data of the program review processes are collected and evaluated throughout the program by several working committees. Several reports are prepared and reviewed as follows:

- Reports related to the curriculum and academic issues such as courses, learning outcomes are discussed at the curriculum committee and improvement plans are created. The output of the curriculum committee needs approval from the program council and/or college council.
- All evaluation results and reports are discussed at the program council, and if needed, at the college council for approval. Improvement plans are created and followed.

- Major changes in the program must be discussed with all stakeholders of the program including PAC, faculty and students, etc. and finally approved by the program, college and institution councils.
- Minor changes need approval from the program council and can be implemented any time during the program review process (assessment cycle).

The following figure shows the review and evaluation processes of the program. The data are collected for all aspects of the program (KPIs, inputs, processes, outputs and outcomes) from various stakeholders. The data are then analyzed. The evaluation results are discussed by the CC and program and college council. Finally, actions are created and implemented and monitored to improve the quality of the program.
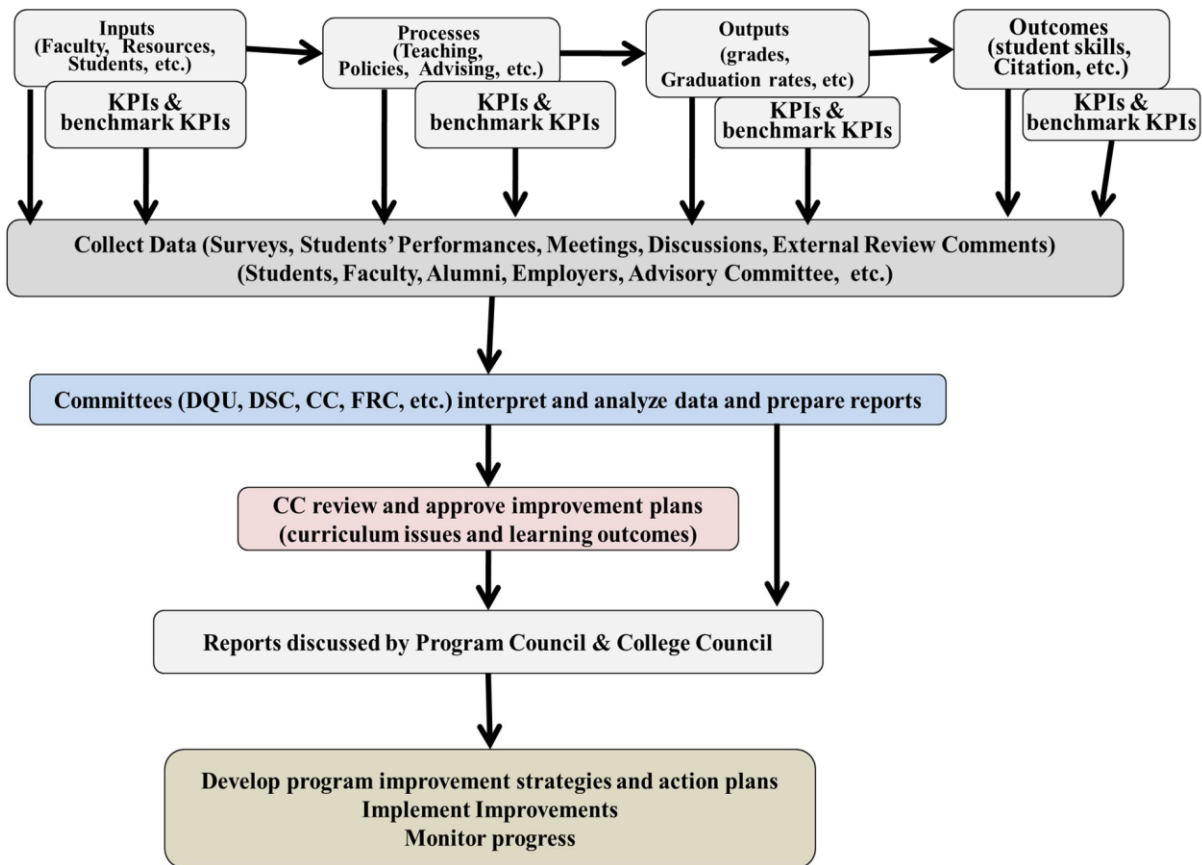
Figure: CS Program Evaluation and Review Processes

PROGRAM'S KNOWLEDGE GROUP

The curriculum committee has decided and approved 7 knowledge areas for CS program. The knowledge areas are as follows:

- Programming Languages Concepts
- Algorithm and Complexity
- Information Management
- Operating Systems and Architecture
- Software Engineering
- Networking and Security
- Social and Professional Issues

The education system is semester based (two semesters in a year) in the department of Computer Science. To be graduated from the department any student must complete a 107 credit hours length Computer Science program. The total credit hours are originated from three requirements: University Requirements(12credit hours), and College requirements(30credit hours) and Department requirements 65credit hours.

Analysis of three requirements for the Computer Science Program

Requirements Name	Total Courses	Total Credit Hours
University Requirements	06	12
College Requirements	09	30
Department Requirements	21	65
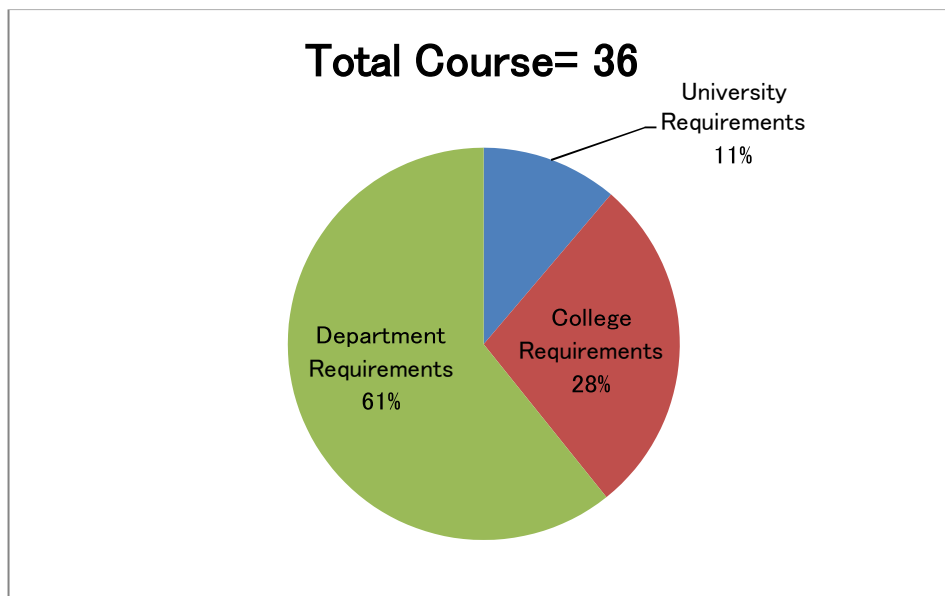
Total Course= 36

University Requirements 11%

College Requirements 28%

Department Requirements 61%

Figure: Analysis the requirements according to the percentage on the basis of total number of courses.
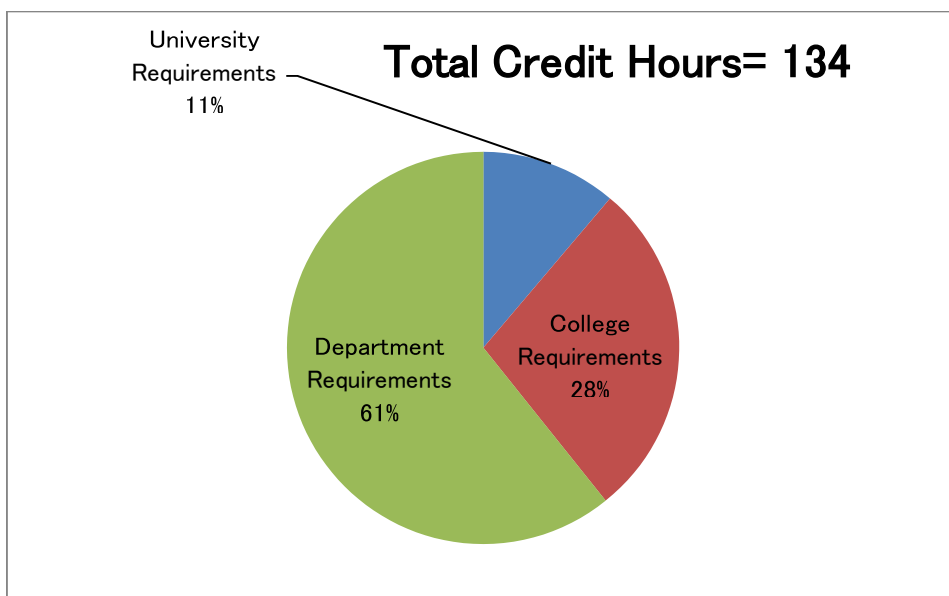
Total Credit Hours= 134

University Requirements 11%

College Requirements 28%

Department Requirements 61%

Figure: Analysis the requirements according to the percentage on the basis of total number of credit Hours.

University Requirements

University Requirements are courses required to obtain a scientific degree, which consists of 6coursesandthe total number of credits hours are of 12unitsasshowninthe 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 Skills	2 (2,0,0)
6	202ARAB-2	Arabic Writing	2 (2,0,0)
		Total Credit Hours	12

College Requirements

The main objective of the college requirements is to provide knowledge and information to students essential 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 and a number of total 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				
SI 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	General 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)	111 CSS-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

Department Requirements

The requirements of department consist of 21different courses with a number of 65 credit hours on the base of computer science program as shown in the table below:

Department Requirements

The requirements of department consist of 21different courses with a number of 65 credit hours on the base of computer science program as shown in the table below:

Department Requirements				
SI 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	Social, Ethical and Professional Issues	3(3,0,1)	
18	203MATH	Advanced Calculus	3 (3,0,1)	
19	105PHIS-3	Advanced Physics	3 (3,0,1)	
20	101BIOL-4	General Biology	3 (3,1,1)	
21	341CIS-3	Operational Research	3 (3,0,1)	
			Total Credit Hours	65

SYMBOLS USED

Meaning of symbols used in this handbook is identified as follows:

Symbols used in the study plan:

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

NUMBERING SYSTEM

The numbering system used for each course at this College is as follows:

Table of example:

Course Code	Course Name
111 CSS-4	Programming Language 1

3 letters, 3 digits, and 1 digit

CREDIT HOURS VS. CONTACT HOURS OF THE PROGRAM

1. The 3 letters (e.g. CSS) indicate the name of the program

2. The first digit from the 3 digits length number (e.g. 1(first) 1(second) 1(third)) represents the level of program, it may be either beginning or medium, or higher (advance) level.

3. The second digit from the 3 digits length number (e.g. 1(first) 1(second) 1(third)) represents the path within the courses of the program.

4. The third digit from the 3 digits length number (e.g. 1(first) 1(second) 1(third)) represents the sequence of the courses of the program.

5. The 1 digit (e.g. 4) represents total credit hours of the course.

Calculation of credit hours (credit hours) and hours of communication (contact hours):

"contact hours" refer to the amount of time that a student spends interacting directly with a faculty member at the time of lectures, laboratory (practical), and tutorial (exercises), whereas "credit hours" is the unit weight for the number of weekly classes of the subject which is determined by the university.

The format of credit hours for each course:

Number of credit hours (theoretical, laboratory (practical), exercises (tutorial)) Number of credit hours calculated from the hours of theoretical and laboratory exercises, where:

Every hour (academic hour=50 minutes) of theory calculated one credit hour. Every two hours of laboratory calculated one credit hour.

Each hour of tutorial (exercise) counted zero credit hours, in other words hours of exercises are not counted in credit hours.

Example:

If a 3-credit "Computer Architecture" course met from 11:00–11:50 on Saturdays, Mondays, and Wednesdays for 14 weeks, then the course would have 42 "credit hours" and 56 (Theoretical/ Lecture=42 + Lab=0 + Tutorial=14) "contact hours".

The above mentioned credit hours are determined by multiplying 1 hour (50-minute= 1 academic hour) classes by 3 (3 classes per week) and then by 14 (14 weeks of classes).

Semester Wise Course Distribution Preparatory Year

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

Level Two			
Course Code	Course Name	Credit Hours	Prerequisite
150MAN-1	Occupational Ethics	1	
140MATH-4	Algebraic Sciences	4	
150SKL-2	Communication Skills	2	
150ENGG-3	English Language: Speaking	3	
151ENGG-2	Report Writing	2	
	Total Number of Credit Hours	12	

Total 27 Credit Hours

Regular Semester

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

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

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

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

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

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

Level Nine			
Course Code	Course Name	Credit Hours	Prerequisite
492CSS-4	Graduation Project 2	4	491CSS-4
341CIS-3	Operational Research	3	
440CSS-3	Social, Ethical, and Professional Issues	2	
429CSS-3	Computer Security	3	329CSS-3
202ARAB-2	Arabic Writing	3	
	Total Number of Credit Hours	15	

Total 107 Credit Hours

Level Wise Credit Hours' Analysis

Level No.	Credit Hours
Level 3	16
Level 4	15
Level 5	16
Level 6	15
Level 7	15
Level 8	15
Level 9	15
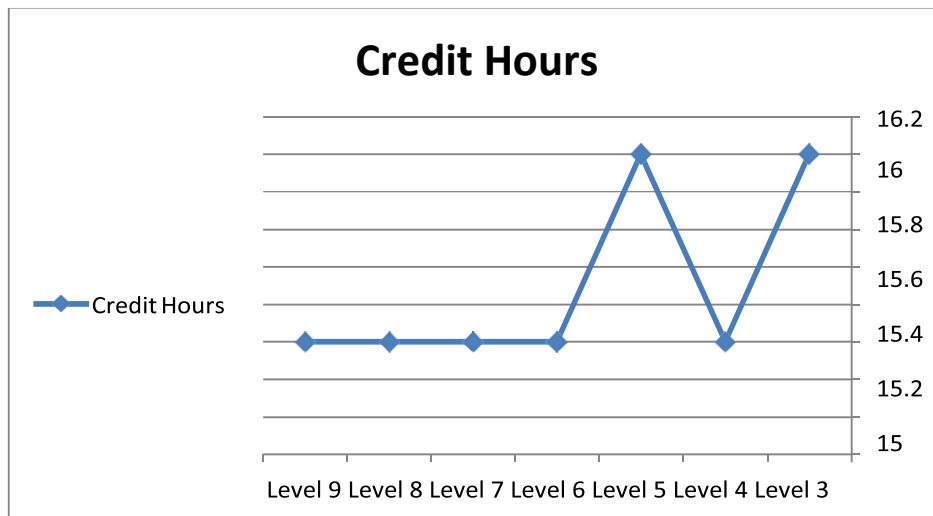
Figure: Analyzing the credit hours per level.

CS Program's Prerequisite Map

LEVEL 1	140TEC-3	140MATH-2	140SKL-2	140ENGG-2	141ENGG-2	142ENGG-2	143ENGG-2
LEVEL 2		150SKL-2	150MATH-4	150MAN-1	150ENGG-2	151ENGG-3	

Preparatory Year

LEVEL-3	111ISL-2	104PHIS-4	111CSS-4	106MATH-3	152MATH-3
LEVEL-4	201ARAB-2	342MATH-3	113CSS-4	324STAT-3	203MATH-3
LEVEL-5	112ISL-2	212CSS-3	105PHIS-4	222CSS-4	CSC330-3
LEVEL-6	235CSS-3	113ISL-2	1O1BIOL-4	342CSS-3	227CSS-3
LEVEL-7	281CSS-3	361CSS-3	457CSS-3	380CSS-3	329CSS-3
LEVEL-8	328CSS-3	474CSS-3	114ISL-2	491CSS-4	456CSS-3
LEVEL-9	429CSS-3	341CIS -3	440CSS-3	492CSS-4	202ARAB-2

Computer Science Program

COURSE DESCRIPTION

Level-3/ Semester-3

Course Code	Course Name	Credit Hours	Prerequisite
104PHIS -4	Fundamentals 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.

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).

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.

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.

Level-4/Semester-4

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 orthogonally and least squares.

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.

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.

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

Course Contents:

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.

Level-5/Semester-5

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.

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.

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

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

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).

Level-6/Semester-6

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.

Course Code	Course Name	Credit Hours	Prerequisite
227 CSS-3	Operating Systems	3 (2,2,1)	226 CSS-2

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.

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

Course Code	Course Name	Credit Hours	Prerequisite
101BIOL-4	General Biology	3 (3, 1, 1)	

Level-7/Semester-7

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

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.

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 perceptron, 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).

Course Code	Course Name	Credit Hours	Prerequisite
380 CSS-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.

Course Code	Course Name	Credit Hours	Prerequisite
457 CSS-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.

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

Level-8/Semester-8

Course Code	Course Name	Credit Hours	Prerequisite
491CSS-4	Graduation Project 1	4(4.0,1)	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).

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.

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.

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.

Level-9/Semester-9

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

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.

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, netiquette), privacy and social issues.

Course Code	Course Name	Credit Hours	Prerequisite
341CIS-3	Operational 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.

GRADUATION PROJECT AND ASSESSMENT SYSTEM

Independent study course whereby a group of students (3 to 4) at level seven selects one of the proposals submitted by department faculty members with a timeline and evidence of research and analysis, meets with an advisor and co-adviser throughout the semester and then provides a final report regarding system requirement, analysis, and design and makes a formal presentation. In the next semester at level eight every group develops, simulates, implements, and tests software, database through the semester and then provides a final report, presents software, and makes a formal presentation.

The major intended learning outcomes of the project or research task.

- Development of skills in planning, analyzing, designing, and carrying out a major research project
- Development of practical skills of using various computer software, programs, programming languages, databases and implement in professional life
- Improvement of analytical, writing, and communicative skills
- Improvement of skills in effective time management
- Improvement in ability to operate as a team member in a significant project
- Improvement in ability to think critically, research in various aspects
- Improvement in ability to respect social, ethical, and moral issues

 Project's study courses offered by the program are mentioned below:

Level No (Semester/year)	Course code	Course Name	Prerequisites
8 (2/4)	491CSS-4	Graduation Project 1	342CSS-3
9 (1/5)	492CSS-4	Graduation Project2	491CSS-4

UPATED STUDY PLAN

The new study plan of the computer science program has been very carefully framed in 2019 to address the most recent development, and attention is dually given to both theory and practice. It will be implemented in 2020.

Computer Science Program Curriculum

150 credit hours (10 Semesters) = 27 Credit Hours (One year PYP) + 123Credit Hours (four years)

Level One

Course Code	Course Name	Credit Hour	Prerequisite
140TEC-2	Computer Skills	2	
140MATH-2	Introduction of Mathematics	2	
140SKL-2	Learning, Thinking and Research Skills	2	
140ENGG-2	English Language: Reading Skills	2	
141ENGG-2	English Language: Writing Skills	2	
142ENGG-2	English Language: Listening and Speaking Skills	2	
143ENGG-2	English Language: Grammars	2	
		14	

Level Two

Course Code	Course Name	Credit Hour	Prerequisite
150MAN-1	Professional Ethics	1	
150MATH-4	Calculus 1	4	140MATH-2
150SKL-2	Communication Skills	2	
150ENGG-3	General English	3	
151ENGG-2	Report Writing	2	
150TEC-1	Computer Skills	1	
		13	

Level Three

Course Code	Course Name	Credit Hour	Prerequisite
104PHYS-4	Principles of Physics	4	
281MATH-3	Calculus 2	3	150MATH-4
211CSS-4	Fundamentals of Programming	4	
111ISL-2	Introduction to Islamic Culture	2	
201ARAB-2	Arabic Language Skills	2	
		15	

Level Four

Course Code	Course Name	Credit Hour	Prerequisite
282MATH-3	Calculus 3	3	281MATH-3
112ISL-2	Islamic Culture 2	2	
212CSS-4	Object Oriented Programming	4	211CSS-4
152MATH-3	Discrete Mathematics	3	
231CSS-4	Computer Organization and Architecture	4	
		16	

Level five			
Course Code	Course Name	Credit Hour	Prerequisite
113ISL-2	Islamic Culture 3	2	
101BIOL-4	General Biology	4	
342MATH-3	Linear Algebra	3	
341CSS-3	Fundamental of Databases	3	
321CSS-3	Data Structures	3	211CSS-4
		15	

Level six			
Course Code	Course Name	Credit Hour	Prerequisite
114ISL-2	Islamic Culture 4	2	
202ARAB-2	Arabic Writing	2	
332CSS-3	Operating Systems	3	211CSS-4
352CSS-3	Human and Computer Interaction	3	
313CSS-3	Programming Paradigm	3	212CSS-4
283MATH-3	Numerical Methods	3	342MATH-3
		16	

Level seven			
Course Code	Course Name	Credit Hour	Prerequisite
424CSS-3	Algorithm Design and Analysis	3	321CSS-3
324STAT-3	Probabilities and Engineering Statistics	3	
451CSS-3	Software Engineering	3	212CSS-3
423CSS-3	Artificial Intelligence	3	
417CSS-3	Mobile Application Development	3	212CSS-4
		15	

Level eight			
Course Code	Course Name	Credit Hour	Prerequisite
414CSS-3	Computer Graphics	3	211CSS-4, 342MATH-3
461CSS-3	Data Communication and Computer Networks	3	
425CSS-3	Machine Learning	3	211CSS-4
422CSS-3	Theory of Computation	3	
442CSS-3	Advance Database Systems	3	341CSS-3
		15	

summer training			
Course Code	Course Name	Credit Hour	Prerequisite
476CSS-2	Industrial Training/Practical Training	2	60 Credit Hours (Excluding Prep Year)

Level nine			
Course Code	Course Name	Credit Hour	Prerequisite
516CSS-3	Simulation and Molding	3	211CSS-4
574CSS-3	Special Topics in CS 1	3	
571CSS-2	Graduation Project 1	2	451CSS-3
562CSS-3	Parallel and Distributed Systems	3	
515CSS-3	Internet Technologies	3	
		14	

Level ten			
Course Code	Course Name	Credit Hour	Prerequisite
553MATH-3	Operational Research	3	
563CSS-3	Computer Security	3	461CSS-3
572CSS-3	Graduation Project 2	3	571CSS-2
573CSS-3	Social, Ethical and Professional Issues	3	
575CSS-3	Special Topics in CS 2	3	574CSS-3
		15	

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