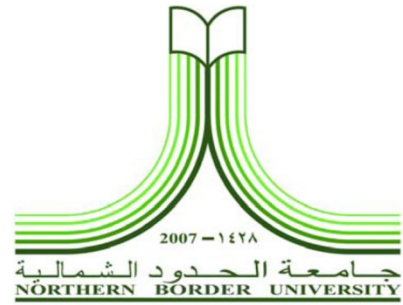**Kingdom of Saudi Arabia**
Higher Education Ministry
Northern Border University
Vice President of Academic Affairs
Unit of Systems and Study Plans

Faculty: Sciences
Department: Computer Sciences

Program and Study Plan Specification
of Bachelor's Degree

Program: Computer Sciences

Program Manager
Dr. Mohamed Shaban Zaky

Committee of Program Development

No.	Name	Description	Faculty	Branch
1	Prof. Aly El-Abd	Head	Sciences	Arar
2	Dr. Romany Fouad	Member	Sciences	Arar
3	Dr. Rasha El Hadary	Member	Sciences and Arts	Turaif

بسم الله الرحمن الرحيم

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Section 1

Study Plan

1. Faculty Overview

1.1 Foundation

The faculty of sciences, the first nucleus of the Northern Border University, was established in the academic year of 1427-1428 H, at Arar city, the Capital of Northern Border Region, KSA.

1.2 Vision

Keeping abreast of the educational progress, taking place in the Kingdom of Saudi Arabia, through achieving the distinction in sciences fields on the local, regional and international level.

1.3 Mission

Graduating highly qualified national competencies that can contribute to the progress of the Kingdom. This can be achieved through providing students with the recent sciences, best state of the art technologies, and developing their skills to help them find a good place in the job market.

1.4 Objectives

- Graduation of national professional competencies needed in the kingdom in the basic scientific fields.

- Supporting the needs of the kingdom in the field of scientific and applied research.

- Contributing in the efforts of technology transfer through authoring, translating, and publishing.

- Introducing scientific consultations and services in different scientific fields to both governmental and private sectors.

1.5 Scientific Departments Divisions Tracks and Centers

The faculty includes 5 scientific departments, which are:

1- Computer Sciences Department
2- Mathematics Department
3- Biological Sciences Department
4- Physics Department
5- Chemistry Department

1.6 Degrees Awarded by faculty and Program Codes

Faculty of (Sciences) awards the following scientific degrees:

Bachelor's Degree
The faculty awards (Bachelor's Degree) for students after the completion of the study of 136 credits, which are composed of 13 credits for the preparatory study and 123 credits approved in the following programs:

No.	Department	Program	Program Code
1	Physics	Physics	1101
2	Chemistry	Chemistry	1102
3	Biological Sciences	Biological Sciences	1103
4	Mathematics	Mathematics	1104
5	Computer Sciences	Computer Sciences	1105

2. Department Overview

2.1 Foundation

The Computer Sciences Department was established with the foundation of the faculty of sciences by 1427 H to prepare distinct national graduates in the field of computer sciences to keep abreast in the development witnessed by the educational renaissance in the Kingdom.

2.2 Vision

To be one of the pioneer departments in achieving the distinction in educational performance, and scientific research, in the Computer Sciences field.

2.3 Mission

Preparing distinct graduates which are highly scientifically and practically qualified, and believing in the job ethics, in order to be able to satisfy the cleverness and technicality needs to both scientific and industrial establishments, and also to be able to compete and perform the job duties assigned to them in high quality.

2.4 Objectives

- To prepare national graduates with the principle Knowledge of the computer sciences field, this will contribute in the community services in all the fields of the development.

- To introduce the computer sciences courses for the other departments of the university.

- To conduct theoretical, experimental, and practical scientific research in the computer sciences field and other related fields.

- To contribute in solving the scientific and industrial problems which facing the development plans in the Kingdom.

2.5 Degrees Awarded by Department

B. Sc. in Computer Sciences

3. General Framework for Distribution of Program Units

Requirements	Courses	Number of Units	Ratio
University Requirements	Obligatory	6	8.3%
	Elective	4	
Faculty Requirements	Obligatory	24	20%
	Elective	0	
Specialization Requirements	Obligatory	65	64.2%
	Helping (if any)	0	
	Elective	9	
	Graduation Project	3	
Free Courses		6	5%
Field Training		3	2.5%
Total of Program Units		120 Units	100%

3.1 University Requirements

3.1.1 Obligatory University Courses

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.			
1	1602101	Arabic Language	2	2	0	2	---	اللغة العربية
2	1601101	Islamic Culture 1	2	2	0	2	---	ثقافة إسلامية 1
3	1601201	Islamic Culture 2	2	2	0	3	1601101	ثقافة إسلامية 2
Total Units of Obligatory University Courses			**6**					

3.1.2 Elective University Courses
The student chooses from elective courses the total of 4 units.

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.			
1	1601xxx	Islamic Culture 3	2	2	0	4	1601201	ثقافة إسلامية 3
2	1601xxx	Islamic Culture 4	2	2	0	4	1601201	ثقافة إسلامية 4
3	1601xxx	Islamic Culture 5	2	2	0	4	1601201	ثقافة إسلامية 5
4	1601xxx	Islamic Culture 6	2	2	0	4	1601201	ثقافة إسلامية 6
Total Units of Elective University Courses			**4**					

3.2 Faculty Requirements

3.2.1 Obligatory Faculty Courses

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.			
1	1101101	General Physics 1	4	3	1	1	--	فيزياء عامة 1
2	1104101	Calculus 1	4	3	1Tu	1	1003101	حساب التفاضل والتكامل 1
3	1001102	Scientific Terminology	2	2	0	1	1001101	مصطلحات علمية
4	1102201	General Chemistry 1	4	3	1	2	--	كيمياء عامة 1
5	1103201	General Biology 1	4	3	1	2	--	أحياء عامة 1
6	1104231	Statistics	3	3	---	2	--	إحصـاء
7	1105101	Introduction to Computer Science	3	2	1	1	1004101	مقدمة علوم الحاسب
Total Units of Obligatory Faculty Courses			24					

3.2.2 Elective Faculty Courses

Not Applicable

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.			
Total Units of Obligatory Faculty Courses			0					

3.3 Specialization Requirements
3.3.1 Obligatory Specialization Courses

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.			
1	1105211	Int. to Programming	3	2	1	3	1105101	مقدمة البرمجة
2	1105221	Digital Logic Design	3	2	1	3	1105101	تصميم المنطق الرقمى
3	1105212	Programming Applications	3	2	1	4	1105211	تطبيقات البرمجة
4	1105222	Digital Systems Design	3	2	1	4	1105221	تصميم النظم الرقمية
5	1105231	Discrete Mathematics	3	3	--	4	1105221	رياضيات متقطعة
6	1105241	Data Structures	3	2	1	4	1105211	هياكل البيانات
7	1105313	O.O.P.	3	2	1	5	1105212	برمجة شيئية
8	1105314	Analysis & Design of Algorithms	3	2	1	5	1105241	تحليل وتصميم الخوارزميات
9	1105323	Computer Architecture	3	2	1	5	1105222	معمار الحاسب
10	1105232	Computation Theory	3	3	0	5	1105231	النظرية الحسابية
11	1105342	Database Systems	3	2	1	5	1105212	نظم قواعد البيانات
12	1105315	Web Programming	3	2	1	6	1105313	برمجة الويب
13	1105333	Artificial Intelligence	3	3	0	6	1105332	ذكاء إصطناعى
14	1105351	Computer Graphics	3	2	1	6	1105313	رسوميات الحاسب
15	1105361	Operating Systems	3	2	1	6	1105323	نظم التشغيل
16	1105371	Local Area Networks	3	2	1	6	1105323	شبكات الحاسب المحلية
17	1105281	Ethical and Professional Practices	2	2	0	6	1601202	الممارسات الأخلاقية والمهنية
18	1105462	Computer Systems Programming	3	2	1	7	1105323 1105313	برمجة نظم الحاسب
29	1105443	Software Engineering	3	3	0	7	1105342	هندسة البرمجيات
20	1105472	Wide Area Networks	3	2	1	7	1105371	شبكات الحاسب الموسعة
21	1105463	Compiler Construction	3	2	1	8	1105462	بناء مترجمات البرامج
22	1105473	Distributed Computing Systems	3	3	0	8	1105472	نظم الحوسبة الموزعة
Total Units of Obligatory Specialization Courses			65					

3.3.2 Obligatory Specialization Helping Courses (if any)
Not Applicable

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسم المقرّر
				Th.	Pr./Tu.			
Total Units of Obligatory Specialization Helping Courses			0					

3.3.3 Elective Specialization Courses
The student chooses from elective courses the total of 9 units.

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسم المقرّر
				Th.	Pr./Tu.			
1	1105491 1105492 1104xxx	Elective Specialization 1 Elect one Course of: Modeling & Simulation Applied Numerical Methods Linear Algebra	3	2	1	7	1105332 1105313	اختياري تخصص 1 يتم اختيار مقرر واحد من: النمذجة والمحاكاة الطرق العددية التطبيقية جبر خطى
2	1105494 1105495 1105496	Elective Specialization 2 Elect one Course of: Dist. Database Systems Database Manage. Sys. Data Mining	3	2	1	8	1105242 1105313	اختياري تخصص 2 يتم اختيار مقرر واحد من: نظم قواعد البيانات الموزعة نظم إدارة قواعد البيانات التنقيب فى البيانات
3	1105497 1105498 1105499	Elective Specialization 3 Elect one Course of: Pattern Recognition Human Comp. Interact. Natural Lang. Process.	3	2	1	8	1105433 1105313	اختياري تخصص 3 يتم اختيار مقرر واحد من: تمييز الأنماط تفاعل الإنسان مع الحاسب معالجة اللغات الطبيعية
Total Units of Elective Specialization Courses			9					

3.3.4 Graduation Project

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسم المقرّر
				Th.	Pr./Tu.			
1	1105482	Graduation Project	3	2	1	8	100Cr. Hr.	مشروع تخرج
Total Units of Graduation Project			3					

3.3.5 Field Training

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.			
1	1105481	Field Training	3	0	3	After Level 6	90Cr. Hr. & Department Approval	تدريب ميدانى
Total Units of Field Training			3					

3.3.6 Auxiliary Courses Offered by the Department
Not Applicable

No	Course Number & Code	Course Title	Credit Units	Units Type		Study Level	Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.			
Total Units of Department Auxiliary Courses			0					

3.4 Plan for Course Distribution According to Levels

3.4.1 PREPARATORY SEMESTER

Preparatory Semester						المستوى التحضيرى
No	Course Number & Code	Course Title	Credit Units	Units Type		Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.		
1	1003101	Math	3	2	1	---	رياضيات
2	1004101	Computer Skills	3	2	1	---	مهارات الحاسب الآلي
3	1001101	English 1	3	2	1	---	اللغة الانجليزية 1
4	1002101	Communication Skills	2	2	0	---	مهارات الإتصال
5	1002102	Thinking Skills	2	2	0	---	مهارات التفكير
Total Units of the Prep. Semester			13				

3.4.2 STUDY LEVELS

First Year:

First Semester						المستوى الأول*
No	Course Number & Code	Course Title	Credit Units	Units Type		Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.		
1	1101101	General Physics 1	4	3	1	--	فيزياء عامة 1
2	1104101	Calculus 1	4	3	1	1003101	حساب التفاضل والتكامل 1
3	1104231	Statistics	3	3	0	--	إحصـــاء
4	1001102	Scientific Terminology	2	2	0	1001101	مصطلحات علمية
5	1601101	Islamic Culture 1	2	2	0	--	ثقافة اسلامية 1
Total Units of the Second Semester			15				

وحدة التمارين المعتمدة = 2 ساعة اتصـــــال / وحدة العملى المعتمـــدة = 3 ساعات اتصال /
* يشترط إجتياز الطالب لمقررات المستوى التحضيرى

Second Semester						المستوى الثانى
No	Course Number & Code	Course Title	Credit Units	Units Type		Course Requisite	اسـم المقرّر
				Th.	Pr./Tu.		
1	1102201	General Chemistry 1	4	3	1	--	كيمياء عامة 1
2	1103201	General Biology 1	4	3	1	--	أحياء عامة 1
3	1602101	Arabic Language	2	2	0	--	اللغة العربية
4	1105101	Introduction to Computer Science	3	2	1	1004101	مقدمة علوم الحاسب
5	1601201	Islamic Culture 2	2	2	--	1601101	ثقافة اسلامية 2
Total Units of the Second Semester			15				

Second Year:

No	Course Number & Code	Course Title	Credit Units	Units Type		Course Requisite	اسـم المقرّر
Third Semester				Th.	Pr./Tu.		المستوى الثالث
1	1105211	Int. to Programming	3	2	1	1105101	مقدمة البرمجة
2	1105221	Digital Logic Design	3	2	1	1105101	تصميم المنطق الرقمى
3	1105281	Ethical and Professional Practices	2	2	0	---	الممارسات الأخلاقية والمهنية
4	1105231	Discrete Mathematics	3	2	1Tu	1105221	رياضيات متقطعة
5	1601xxx	Elective (1) Islamic Culture	2	2	---	1601201	اختياري(1) ثقافة إسلامية
Total Units of the Third Semester			**13**				

No	Course Number & Code	Course Title	Credit Units	Units Type		Course Requisite	اسـم المقرّر
Fourth Semester				Th.	Pr./Tu.		المستوى الرابع
1	1105212	Programming Applications	3	2	1	1105211	تطبيقات البرمجة
2	1105222	Digital Systems Design	3	2	1	1105221	تصميم النظم الرقمية
3	1105241	Data Structures	3	2	1	1105211	هياكل البيانات
4	1105232	Computation Theory	3	3	0	1105231	النظرية الحسابية
5	1601xxx	Elective (2) Islamic Culture	2	2	0	1601201	اختياري(2) ثقافة إسلامية
Total Units of the Fourth Semester			**14**				

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Third Year:

						المستوى الخامس	Fifth Semester		

No	Course Number & Code	Course Title	Credit Units	Units Type		Course Requisite	اسـم المقرّر
				Theo.	Pr./Tu.		
1	1105313	O.O.P.	3	2	1	1105212	برمجة شيئية
2	1105314	Analysis & Design of Algorithms	3	2	1	1105241	تحليل وتصميم الخوارزميات
3	1105323	Computer Architecture	3	2	1	1105222	معمار الحاسب
4	1105342	Database Systems	3	2	1	1105212	نظم قواعد البيانات
5		Free Course1	3				مقرر حر1
Total Units of the Fifth Semester			15				

Sixth Semester							المستوى السادس

No	Course Number & Code	Course Title	Credit Units	Units Type		Course Requisite	اسـم المقرّر
				Theo.	Pr./Tu.		
1	1105315	Web Programming	3	2	1	1105313	برمجة الويب
2	1105333	Artificial Intelligence	3	3	0	1105232	ذكاء إصطناعى
3	1105351	Computer Graphics	3	2	1	1105313	رسوميات الحاسب
4	1105361	Operating Systems	3	2	1	1105323	نظم التشغيل
5	1105371	Local Area Networks	3	2	1	1105323	شبكات الحاسب المحلية
Total Units of the Fifth Semester			15				

Fourth Year:

	Seventh Semester					المستوى السابع
No	**Course Number & Code**	**Course Title**	**Credit Units**	**Units Type**		**اسـم المقرّر**
				Th.	**Pr./Tu.**	
1	1105462	Computer Systems Programming	3	2	2	1105323 1105313	برمجة نظم الحاسب
2	1105443	Software Engineering	3	3	0	1105342	هندسة البرمجيات
3	1105472	Wide Area Networks	3	2	1	1105371	شبكات الحاسب الموسعة
4		Free Course2	3				مقرر حــر2
5	110xxxx	Elective Specialization (1)	3				اختياري تخصص 1
	Total Units of the Sixth Semester		**15**			

Note: the column for "Course Requisite" applies to the requisite codes listed above.

No	**Course Number & Code**	**Course Title**	**Credit Units**	**Units Type**		**اسـم المقرّر**
				Th.	**Pr./Tu.**	**Course Requisite**
1	1105482	Field Training	3	0	3	90 Cr. Hr. & Department Approval	تدريب ميداني
	Total Units of Field Training		**3**			

	Eighth Semester					المستوى الثامن
No	**Course Number & Code**	**Course Title**	**Credit Units**	**Units Type**		**اسـم المقرّر**
				Th.	**Pr./Tu.**	**Course Requisite**
1	1105463	Compiler Construction	3	2	1	1105462	بناء مترجمات البرامج
2	1105473	Distributed Computing Systems	3	3	0	1105472	نظم الحوسبة الموزعة
3	1105483	Graduation Project	3	2	1	100 Cr. Hr.	مشروع تخرج
4	1105xxx	Elective Specialization (2)	3				اختياري تخصص 2
5	1105xxx	Elective Specialization (2)	3				اختياري تخصص 3
	Total Units of the Seventh Semester		**15**			

Section 2

Program Specification

(A) Program Identification and General Information

Program title and code	Computer Sciences 1105		
Program duration	4 years		
Total credit units needed for the completion of the program	120		
Degree awarded on completion of the program	B. Sc. in Computer Sciences		
Major tracks or specializations within the program	------------------------		
Intermediate exit points and awards (if any) (e. g. associate degree within a bachelor degree program)	No Intermediate Exit Points in the Program		
Professions or occupations for which students are prepared.	Programmer – Systems Analyst – Web Developer – Software Support– Hardware Support – Network Administrator – Database Developer – Database Administrator – Research Assistant – University Computer Sciences Instructor		
Program type	**New program** Yes [ ] No [√]	If yes, planned starting date	
	Continuing program Yes [√] No [ ]	**If yes, year of most recent major program review**	1435 H
		Organization involved in recent major review	Unit of Systems and Study Plan
		Accreditation review by	
Name and position of faculty member managing or coordinating the program	Principle Manager: **Prof. Aly El Abd** Assistant Manager: **Dr. Romany Fouad**		
Location in which the program is offered	College of sciences – Arar		

(B) Program Context

1- Reasons for the introduction or development of the Program.

- **(a) Summarize economic reasons, social or cultural reasons, technological developments, national policy developments or other reasons:**

  The main reason for the development of the program is technological developments and to cope with the peer programs in accredited universities.

- **(b) Explain the relevance of the program to the mission of the institution:**

  The program is directly relevant and completely correlated to the mission of the NBU as it is clear from the mission of the program and the mission of the university. Both of the two missions concentrate on distinction and the creation of a knowledge society which is able to keeping abreast of the new world scientific developments.

2- Relationship (if any) to other programs offered by the institution/college/department.		
(a) Does this program offer courses that students in other programs are required to take?	Yes [√] No [ ]	**If yes, what should be done to make sure those courses meet the needs of students in the other programs?** Always there is a complete coordination between the program manager and the managers of the other programs to satisfy their requirements and take into consideration the prerequisites required to teach any suggested courses. The other programs of the Faculty of Sciences need the Introduction to Programming course as a helping course in their study plans.
(b) Does the program require students to take courses taught by other departments?	Yes [√] No [ ]	**If yes, what should be done to make sure those courses in other departments meet the needs of students in this program?** Always there is a complete coordination between the program manager and the managers of the other programs to satisfy our requirements and take into consideration the prerequisites required to teach any suggested courses. The students at the department of the computer Sciences obligatory study the following courses from other departments at the Faculty of Sciences: Mahmatics-1, Physics-1, Chemistry-1 & Biology-1 and need the following helping courses from the department of Mathematics: Probability & Statistics, Mathmatics-2 and Mathmatics-3. Also students need to study the English for Scientific Purposes course from outside the department.

3- Special needs or characteristics for the students in the program (if any).		
Do the students who are likely to be enrolled in the program have any special needs or characteristics that should be considered in planning the program?	Yes [√] No [ ]	**If yes, say these special needs or characteristic:** 1. The applicant must be a full-time study for the duration of joining the faculty. 2. The applicant should have a high school certificate or its equivalent. 3. Applicants who obtain certificates from abroad must be approved by the Commission of Certificates. Equivalency in the Ministry of Higher Education. 4. The overall rate of the applicant should not be less than the rate determined by the university.

4- What should be done in the program to respond to these special characteristics?

Students have to be prepared in their first year of study by giving them courses in English, Thinking, Computer and Communication skills, Pre-Calculus, and Scientific Terminology.

(C) Mission and Goals of the Program

1- Program Mission Statement.

Preparing distinct graduates which are highly scientifically and practically qualified and believing in the job ethics in order to be able to satisfy the cleverness and technicality needs to scientific, governmental and industrial establishments.

2- Program Objectives.

- To prepare national graduates with the principle Knowledge of the computer sciences field, this will contribute in all the fields of the development.
- To introduce the computer sciences courses for the other departments of the university.
- To contribute in solving the scientific and industrial problems which facing the development plans in the Kingdom.

3- List any major changes or strategic new developments planned for the program within the next three to five years to help achieve its mission. For each change or development describe the major strategies to be followed and list the indicators that will be used to measure achievement.

Major changes or strategic new developments	Description of the strategies to be followed	Indicators to be used to measure achievement
Updating the contents of the existing courses and adding some new courses	Reviewing and updating the Program study plan periodically	- The ratio of updated courses to the total number of courses - Rate of updating per year
Upgrading the efficiency of the faculty members	Encouraging training, scientific research and attending national and international conferences	- Number of workshops attended per year - Number of published research papers per year - Number of attended conferences per year
Updating the textbooks used in the study plan	Requesting the appropriate committee to review the text books	- The rate of textbooks change should be at least once every two years.
Supporting the program requirements with modern technology	Establishing a modern website and providing the required computer labs with the modern computers and software	-The frequency of website update -The ratio of developed labs to the total number of labs - The frequency of lab software updates

(D) Program Structure and Organization

1- Program Description.

- A program or department manual should be available for students or other stakeholders and a copy of the information relating to this program should be attached to the program specification.

  - This information should include required and elective courses, credit hour requirements and department/college and institution requirements, and details of courses to be taken in each year or semester.

2- Development of Special Student Characteristics or Attributes.

- List any special student characteristics or attributes beyond normal expectations that the institution, college or department is trying to develop in all of its students.

  Normally one or two, up to a maximum of four that directly reflect the program mission and distinguish this program from others in the same field and make it exceptional.

  For each special attribute indicate the teaching strategies and student activities to be used to develop it and the evidence to be used to assess whether it has been developed in all students.

Special Attributes	Strategies or student activities to be used throughout the program to develop these special attributes and the evidence	
Highly qualified and competitive graduates	Strategy	Diversity in courses, textbooks and faculty members and motivating students to share in the field contests and in the respected scientific Societies like IEEE and ACM.
	Evidence	- Questionnaire for stake holders opinion - Questionnaire for faculty members opinion - Reports published by the National Center for Assessment in Higher Education (Qiyas)

3- Required Field Experience Component (if any).

- A special specification form must be filled in, if field experience is a requirement for the completion of the program.

No	Course Number & Code	Course Title	Credit Units	Units Type		Study level/ year at which the field experience is offered	Course Requisite	Time allocation and scheduling arrangement.
				Theo.	Prac.			
1	1105482	Field Training	3	0	3	Summer Training After level 6	90 Cr. Hr. & Department Approval	

- **Brief description of field experience activity:**

    The field experience activity aims to provide an opportunity for students to apply their theoretical knowledge and gain professional experience through dealing with many different people.

- **List the major intended learning outcomes for the program to be developed through the field experience:**

    To make students able to:
    - Identify, analyze problems and evaluate solutions by acquiring many experiences through dealing with many different people.
    - Work effectively and constructively in many different environments and in a variety of complex situations.
    - Build positive relationships with others and interact effectively with them in order to work toward a common outcome
    - Actively listen and respond to the ideas of other people
    - Exercise initiative and responsibility, taking action and engaging others to make a positive difference for the common good.
    - Judge situations, actions, decisions and apply creative and innovative solutions to existing and emerging problems.

-4- Project or Research Requirements (if any).

- **Summary of any project or thesis requirement in the program. (Other than projects or assignments within individual courses)**
  (A copy of the requirements for the project should be attached.)

No	Course Number & Code	Credit Units	Units Type		Course Requisite	Study level/year at which the project or research is undertaken
			Th.	Pr./Tu.		
1	1105481	3	1	1	100Cr. Hrs.	8

- **Brief description for the project or research:**

    The project team is expected to develop an application to solve a specific problem by applying previously learned concepts and methods during the previous courses. The student is typically expected to study the problem, perform the analysis, determine the requirements, design the solution, and implement the solution, and documentation of the final project report and preparing for the presentation. The project topic may be provided by the department or by the student, subject to the department approval.

- **List the major intended learning outcomes of the project or research task:**

    1. To work as a member in a team work

2. To apply the knowledge grasped along the previous semesters in:

- Studying a problem

- Performing the analysis

- Specifying the requirements

- Proposing the suitable solution

- Implementing the proposed solution

- Documenting the different phases of the project contribution

- Preparing for presenting his work and submitting the final document of the project

- **Brief description of provisions for student academic advising and support:**

  - Encouraging the students to demonstrate their theoretical knowledge and professional skills.
  - Helping the students to develop their communication skills.

- **Description of assessment procedures (including mechanism for verification of standards):**

  - Submitting a final report to assess documentation abilities
  - Oral presentation to assess professional skills
  - Discussion to assess intellectual skills and personal understanding

5- Development of Learning Outcomes in Domains of Learning

- **For each domain of learning shown below indicate:**
  - **The knowledge or skill the program is intended to develop and the level of that knowledge and skill.**
  - **(As a guide see general descriptions of knowledge and skills in the National Qualifications Framework for the qualification level of this program)**
  - **The teaching strategies to be used in courses in the program to develop that knowledge and those skills.**
  - **(this should be a general description of the approaches taken throughout the program but if particular responsibility is to be assigned to certain courses this should be indicated)**
  - **The methods of student assessment to be used in courses in the program to evaluate learning outcomes in the domain concerned**

- **(a) Knowledge Domain.**
  Summary description of the knowledge to be acquired:

  On successful completion of the program, graduates should be able to:
  1. Understand the essential mathematics relevant to computer science and the corresponding applications
  2. Develop programming applications using structured and object oriented high level programming languages
  3. Analyze a problem, and define the computing requirements appropriate to its solution

4. Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs
5. Use current techniques, skills, and tools necessary for computing practices
6. Apply mathematical foundations, algorithmic principles, data structures, 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
7. Apply design and development principles in the construction of software systems of varying complexity
8. Understand the theory behind the design of the computer system software like operating systems, compilers, and interpreters
9. Understand the concepts of digital systems design, computer architecture and their operation
10. Understand the computer networking taxonomy, models, architectures, classifications, and the corresponding protocols and implementations
11. Show a critical understanding of the broad context within computing including issues such as quality, reliability, and performance evaluation

Teaching strategies to be used to develop that knowledge	Methods of assessment of knowledge acquired
Lectures Tutorial classes Lab experiments Self readings	Homework assignments, Quizzes, periodical exams 1 &2 and final exam

- **(b) Cognitive Skills Domain.**
  Description of cognitive skills to be developed and level of performance expected:

  On successful completion of this program, graduates should be able to:

  1. Define traditional and nontraditional problems, set goals towards solving them, and observe results.
  2. Perform comparisons between (algorithms, methods, techniques...etc.)
  3. Perform classifications of (data, results, methods, techniques, algorithms... etc.)
  4. Identify attributes, components, relationships, patterns, main ideas, and errors
  5. Summarize the proposed solutions and their results
  6. Restrict solution methodologies upon their results
  7. Establish criteria, and verify solutions
  8. Identify a range of solutions and critically evaluate and justify proposed design solutions
  9. Solve computer science problems subject to commercial or industrial constraints
  10. Work with and model computer systems at different and appropriate levels of abstraction
  11. Create and/or justify designs to satisfy given requirements (synthesis, evaluation, application)
  12. Analyzes and evaluate a range of options in producing a solution to an identified problem
  13. Perform problem analysis from written descriptions and derive requirements specifications from an understanding of problems (analysis, synthesis)
  14. Apply the concepts, principles, theories and practices underpinning computing as an academic discipline

15. Define and assess criteria to measure the appropriateness of a computer system for its current deployment and future evolution
16. Synthesize ideas, proposals and designs effectively using rational and reasoned arguments for presentation to a range of audiences
17. Generate and evaluate the results of tests to investigate the functionality of computer systems

Teaching strategies to be used to develop these cognitive skills	Methods of assessment of students cognitive skills
Lectures Seminars Tutorials	Home works and Quizzes

- **(c) Interpersonal Skills and Capacity to Carry Responsibility Domain.**
  Description of the level of interpersonal skills and capacity to carry responsibility to be developed:
  On successful completion of this program, graduates should be able to:

  1. Communicate effectively by oral, written and visual means
  2. Work effectively as an individual and as a member of a team
  3. Collaborate effectively within multidisciplinary team
  4. Work in stressful environment and within constraints
  5. Lead and motivate individuals
  6. Manage tasks and resources
  7. Search for information and adopt life-long self-learning
  8. Acquire entrepreneurial skills
  9. Manage one's own learning and development

Teaching strategies to be used to develop these skills and abilities	Methods of assessment of students interpersonal skills and capacity to carry responsibility
Discussions through the lectures and tutorial classes and team work assignments	Open discussions and posing questions through the lectures and tutorial classes

- **(d) Communication, Information Technology and Numerical Skills Domain.**
  Description of the communication, information technology and numerical skills to be developed:
  On successful completion of this program, graduates should be able to:

  1. Prepare and present seminars to a professional standard
  2. Communicate effectively with team members, managers and costumers
  3. Use IT skills and display mature computer literacy
  4. Demonstrate efficient IT capabilities and use related computer software packages
  5. Extract high benefits from the use of the World Wide Web

6. Develop a range of fundamental research skills, through the use of online resources, and technical repositories
7. Prepare documentation for their work in the form of standard reports
8. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension

Teaching strategies to be used to develop these skills	Methods of assessment of students numerical and communication skills
- Lectures - Using computer laps - Tutorials	- Exams - Assignments - Reports

- **(e) Psychomotor Skills Domain (if applicable).**
  Description of the psychomotor skills to be developed and the level of performance required:

  Not applied, in accordance to the nature of the program.

Teaching strategies to be used to develop these skills	Methods of assessment of students psychomotor skills
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6- Admission Requirements for the Program.

- **Attach handbook or bulletin description of admission requirements including any course or experience prerequisites.**
  1. The applicant must be a full-time study for the duration of joining the faculty.
  2. The applicant should have a high school certificate or its equivalent.
  3. Applicants who obtain certificates from abroad must be approved by the Commission of Certificates Equivalency in the Ministry of Higher Education.
  4. The overall rate of the applicant should not be less than the rate determined by the university.

7- Attendance and Completion Requirements.

- **Attach handbook or bulletin description of requirements for:**
  a - Attendance:
  b- Progression from year to year:
  c- Program completion:

See Attachment (3)

(E) Regulations for Student Assessment and Verification of Standards

1- Regulations or Policies for Allocation and Distribution of Grades.

- **If the institution, college, department or program has policies or regulations dealing with the allocation or distribution of students grades state the policy or regulation, or attach a copy:**

  The Credit hour system as determined by the Ministry of Higher Education regulations for teaching and exams

2- Describe Processes will be Used for Verifying Standards of Achievement.

- **(e.g.: check marking of sample of tests or assignments Independent assessment by faculty from another institution) (processes may vary for different courses or domains of learning)**

  - Unified exams, group marking and group grading for multi-section courses
  - Internal assessment at the end of semester

(F) Student Administration and Support

1- Student Academic Counseling

- **Describe procedures to be made for academic counseling and advice for students, including both scheduling of faculty office hours and advice on program planning, subject selection and career planning (which might be available at college level).**

  - Meeting new students and making academic orientations for them.
  - Provide counseling to the students.
  - A weekly office schedule is displayed on each faculty member's office with Academic advising hours to provide students with extra assistance and help in solving their academic problems.
  - There exists an academic advisor for each student in the department to follow him up.

See Attachment (4)

2- Student Appeals

- **Attach regulations for student appeals on academic matters, including processes for consideration of those appeals.**

See Attachment (5)

(G) Text Books and Reference Materials

1- Describe processes to be followed by faculty in the program for planning and acquisition of text, reference and other resource material including electronic and web based resources.

- Texts and references are chosen by appropriate committees in the department and finally approved in the departmental council.
- Texts and references are made available in an appropriate time by the book shop and by the central library of the university.
- Original and licensed Software packages required for teaching some courses are made available
- The university provides all the necessary web based resources through the deanship of IT and Libraries

2- Describe processes to be followed by faculty in the program for evaluating the adequacy of book, reference and other resource provision.

- Reviewing the contents of these texts and references by the appropriate committees in the department and submitting the suitable report.
- Authored or translated texts are sent to referees.

Section 3

Courses Specification

First Level Course Specification

Course Name	General Physics1		اسم المقرر باللغة العربية
			فيزياء عامة 1

Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1101101		4		3	3	6

Track	☐ University Requirement ☒ College Requirement ☐ Core ☐ Elective

Level	1	Pre-requisite: ---	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1- Understand how to measure and to convert units

2- Know the motion in different dimensions

3- Understand the relationship between the force and motion

4- Differentiate between kinetic energy and potential energy

5- Understand the concept of energy conservation

Course Description(brief):
This course provides a general introduction to the fundamental concepts of mechanics. The course introduces students to measurements, units, dimensions, vectors. Motion along a straight line, motion in two and three dimensions, force, kinetic energy, potential energy, conservation of energy and linear momentum.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☐ Lab		☒ Participation	

Textbook (only one):
Halliday, Resnick & Walker, Fundamentals of Physics, 8th Ed., John Wiley & Sons, 2008

Reference Book (no more than 2):
1. Serway, Physics for Scientists and Engineers with Modern Physics, 3rd Ed., Prentice Hall, 2000.
2. Sears, Zemansky, and Young, University Physics, 1995

Course Name	Calculus1	اسم المقرر باللغة العربية
		حساب التفاضل والتكامل1

Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1104101		4		3	2	5

Track	☐ University Requirement ☒ College Requirement ☐ Core ☐ Elective

Level	1	Pre-requisite: 1003100	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:

1. Handle functions occurring in calculus and in the mathematical modeling

2. Grasp the central idea of limit and continuity, and its applications

3. Understand the main theme of calculus and its applications

4. Differentiate standard functions by applying the fundamental rules of differentiation

5. Compute the optimal values of functions

6. Apply the concepts of monotonicity and concavity in sketching the plane curves

Course Description(brief):

This course is the first Calculus course dealing mainly with differential calculus. After a discussion of few mathematical preliminaries, the following topics are discussed: functions and models, limits and derivatives, differentiation rules, and finally applications of differentiation.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☐ Lab		☒ Participation	

Textbook (only one):
H. Anton, I. Bivens and S. Davis, Calculus Early Transcendental, 9th Ed., John Willy & Sons, 2009

Reference Book (no more than 2) :

1. J. Stewart, Calculus Early Transcendental, 6th Ed., International Metric Version, 2008

2. R. Adams, C. Essex, Calculus a Complete Course, 7th Ed., Pearson Canada, 2010

Course Name	Statistics			اسم المقرر باللغة العربية		
				إحصاء		

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1104231		3		2	2	4

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective

Level	1	Pre-requisite: ---	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1. Understand the basic concepts of probability, random variables, probability distribution, and joint probability distribution
2. Compute point estimation of parameters, explain sampling distributions, and understand the central limit theorem
3. Construct confidence intervals on parameters for a single sample
4. Compute and interpret descriptive statistics using numerical and graphical techniques
5. Use SPSS or some suitable package to practice real applications

Course Description(brief):

This course in probability and statistics is designed for computer science students. Probability is used to construct parametric models that often arise in computer science and engineering problems. Statistics is then used to estimate the parameters of these models based on available data, check the adequacy of the fitted models, and test specific hypotheses. Topics include random variables and their probability distributions including uniform, binomial, geometric, Poisson, normal, and exponential distributions; expected value of functions of random variables; stochastic simulation; sampling distributions; maximum likelihood and least squares methods of estimation; statistical inference including hypothesis testing and interval estimation.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):

Michael Baron, Probability and Statistics for Computer Scientists, 2nd Ed., Chapman and Hall, 2013

Reference Book (no more than 2):

1. Montgomery Douglas C. and Runger George C., Applied Statistics and Probability for Engineers, 5th Ed., John Wiley and Sons, 2011
2. F.M. Dekking et al, A Modern Introduction to Probability and Statistics, Springer, 2007

Second Level Course Specification

Course Name	Introduction to Computer Science		اسم المقرر باللغة العربية		
			مقدمة علوم الحاسب		

Course Information	Course Code	Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105101	3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective		
Level	2	Pre-requisite: 1004101	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:

1. Appreciate the importance of the computer science field

2. Understand the relevance between the courses of the computer science curriculum

3. Broadly discuss the major topics included in the computer science field

4. Appreciate why computers are essential components in business and society

5. Understand how the computer is used as a problem solver

Course Description(brief):

The course is an overview of computer science, from which students can appreciate the relevance of future courses in the field. This survey approach provides a theoretical, practical, and realistic understanding of the entire field. It begins with the fundamentals of data processing, data representation and storage, the processing inside the computer architecture to get information, investigating , the topics of algorithms, and the development of programming languages, and software, progresses to the study of operating systems and computer networks and internet, major applications of computer technology via graphics and artificial intelligence will be surveyed, and closes with an introduction to the abstract theory of computation.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
J. Glenn, David T. & Dennis B., Computer Science: an over view, 11th Ed, Addison-Wesley, 2013

Reference Book (no more than 2) :
David Evans, Int. to Computing: Explorations in Language, Logic, and Machines, CSIPP, 2011
George Beekman, Introduction to Computing ,4th Ed., Pearson, 2012

Course Name	General Chemistry1		اسم المقرر باللغة العربية
			كيمياء عامة 1

Course Information	Course Code	Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1102201	4		3	3	6

Track	☐ University Requirement ☒ College Requirement ☐ Core ☐ Elective

Level	2	Pre-requisite: ---	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Differentiate between the atom, element, molecule and calculate the atomic number, the mass number and the isotope abundances
2. Name compounds, differentiate between the chemical ,molecular & empirical formulas, and solve all stoichiometric problems
3. Understand the gases law and solve their problems
4. Evaluate the different quantum numbers of an electron, Write the electronic configuration, and Solve the problems of chemical and ionic equilibrium
5. Understand the basic principles of organic chemistry and biochemistry

Course Description(brief):
This course introduces students to the basic knowledge and principles in chemistry. Atomic structure, periodic table, chemical bonding and molecular geometry, hybridization, molecular orbital theory of diatomic molecules, chemical and ionic equilibrium, basic principles of organic chemistry, types of organic compounds and their IUPAC nomenclature are introduced.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☐ Lab		☐ Participation	

Textbook (only one):
Chang, Chemistry, 9th Ed., McGraw-Hill, 2008

Reference Book (no more than 2) :
6. A. El-Awady and others, General Chemistry (In Arabic), 4th Ed., Hafiz Pub., 1998.
7. S. Ezmarly and Others, Organic Chemistry (in Arabic), 2nd Ed., 1987

Course Name	General Biology1	اسم المقرر باللغة العربية
		أحياء عامة 1

Course Information	Course Code		Credit Units		Contact Hours	Lec.	Pr./Tu.	Tot.
	1103201		4			3	3	6

Track	☐ University Requirement ☒ College Requirement ☐ Core ☐ Elective

Level	2	Pre-requisite: ---	Co-requisites (if any)

Course Objectives: By the end of this course the student will be able to:
1. Understand the concepts and theories in General Chemistry and its importance in daily life
2. Apply all the knowledge and skills for General Biology in day situations for success communication in Scientific, practical and social life.
3. Grasp the mechanics of successful interaction between the principles of biology and scientific theories and the surrounding environment

Course Description(brief):
Getting Acquainted with Biology: what is biology?, branches of biology, historical development of biology, characteristics of life, how biological studies are conducted?, applications of biology, relations with other sciences, careers for biology, Chemical Basis of Life: inorganic components of living organisms-organic components of living organisms, biological reactions and enzymes, Cells and Tissues: structure and functions, prokaryotic cells, eukaryotic cells, replication of cells, mitosis and meiosis, plant and animal tissues, Biodiversity: principles of taxonomy and classification, viruses, bacteria, algae and fungi, plants, animals, nutrition, metabolism and bioenergetics, Photosynthesis: fixation of sun energy-synthesis of biological macromolecules, energy storage, breakdown of biological macromolecules, energy release, Excretion: excretion in simple forms of life, excretion in plants, excretion in animals, respiration, Circulatory System: blood composition & functions, heart & vessels-lymph & lymphatic system, Reproduction, Fertilization and Development: simple forms of life-Plants, The Basic Genetic Mechanisms: classic genetics, molecular genetics.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☐ Lab		☒ Participation	

Textbook (only one):
Jane B. Reece et all, Campbell Biology: Concepts & Connections, 7th Ed., Benjamin Cummings, 2011

Reference Book (no more than 2):
Jane B. Reece et all, Investigating Biology Manual, 7th Ed., Benjamin Cummings, 2010

Third Level Course Specification

Course Name	Introduction to Programming		اسم المقرر باللغة العربية			
			مقدمة البرمجة			

Course Information	Course Code		Credit Units		Contact Hours	Lect.	Pr./Tu.	Tot.

Course Information	Course Code	Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105211	3		2	3	5
Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective					
Level	3	Pre-requisite: 1105101		Co-requisites (if any)		

Course Objectives:
By the end of this course the student will be able to:
1. Understand problem solving Methodology
2. Perform program design techniques (flowcharts and pseudo-code)
3. Understand the data types and programming structures of the C language
4. Demonstrate the ability to implement algorithms in C language
5. Pursue courses such as application programming or O.O.P.

Course Description(brief):
This course introduces students to the problem solving methodology. It stresses on good program design, good programming style, and structured program development using C. Basic concepts in structured programming and top-down design with stepwise refinement will be introduced. Topics covered include: algorithm design process, program development, coding, debugging, program structure, simple data types and structured types, various control structures, sequencing, loops, conditionals, functions and pointers.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Jeri R. Hanly, Elliot B. Koffman, Problem Solving and Program Design in C, 7th Ed., Addison Wesley, 2012

Reference Book (no more than 2):
Maureen Sprankle, Problem Solving and Programming Concepts, 9th Ed., Pearson, 2011

Course Name	Digital Logic Design		اسم المقرر باللغة العربية
			تصميم المنطق الرقمى

Course Information	Course Code	Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105221	3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective

Level	3	Pre-requisite: 1105101	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Understand number systems and Boolean Algebra

2. Understand the fundamentals of digital gates

3. Obtain the minimal component design for a given logical circuit

4. Practically realize the design of logical circuits using the available lab tools

Course Description(brief) :
This course introduces students to Number Systems, Boolean Algebra, DeMorgan Theorem, Minimization Techniques, Algebraic techniques, Karnaugh maps and Quin-McCluskey methods, Computer Logic Circuits, Flip-Flops, Registers, Counters, Encoders, Decoders, Half Adder and Full Adder, Sequential Circuits, State assignment and minimization.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Digital Design and Computer Architecture, David Harris and Sarah Harris, 2nd Ed., Elsevier, 2012

Reference Book (no more than 2) :
 M. Moris Mano and Michael D. Ciletti, Digital Design, 5th Ed., Prentice Hall, 2013.

Course Name	Ethical and Professional Practices	اسم المقرر باللغة العربية
		الممارسات الأخلاقية والمهنية

Course Information	Course Code	Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1105281	2		2	0	2

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective		
Level	3	Pre-requisite: ---	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Identify ethical responsibilities and considerations and apply ethics, including professional codes of ethics, in scenarios and case studies.
2. Identify and use resources for keeping up with the profession.
3. Discuss legal and ethical issues relevant to freedom of speech, intellectual property, privacy, and security.
4. Appreciate how rapid changes in technology might affect ethical issues and changing norms of behavior
5. Understand the ethical issues associated with gathering, storing and accessing genetic information in databases.

Course Description(brief):
Overview of Ethics, Brief Introduction to Morality, Ethics for IT Professionals and IT Users ACM Code of Ethics and Professional Conduct, Association of Information Technology Professionals (AITP) Code of Ethics, Software Engineering Code of Ethics and Professional Practice, Sys-admin, Audit, Network, Security (SANS) IT Code of Ethics, Computer and Internet Crime, Privacy, Freedom of Expression, Intellectual Property, Impact of Information Technology on the Quality of Life, Social Networking, Ethics of IT Organizations.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☐ Lab		☒ Participation	

Textbook (only one):
Reynolds, G., Ethics in Information Technology, 4th Edition, Course Technology: Boston, 2012.

Reference Book (no more than 2) :
M. David Ermann, Michele S. Shauf , Computers, Ethics, and Society, Oxford University Press

Course Name	Discrete Mathematics			اسم المقرر باللغة العربية			
				رياضيات متقطعة			

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105231		3		2	2	4

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	3	Pre-requisite: 1105221	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Use logic to determine the validity of an argument

2. Construct the proof of a theorem

3. Understand the terminology, operations, and symbols of set theory

4. Use combinatorial techniques when needed in solving problems

5. Identify relations; specifically, a partial order, equivalence, and total order relations

Course Description(brief) :
The course provides an introduction to mathematical structures of computer science. Topics discussed include logic of compound and quantified statements, number theory and methods of proof, sequences and mathematical induction, set theory, counting methods, Recursive definitions, Sequences, Summations, functions and relations. The course lays down the mathematical formulation necessary for success in the computer science field.

Evaluation	☒ **Periodic tests**		☐ **Project**		☒ **Quizzes**	
	☒ **Final-exam**		☐ **Lab**		☐ **Participation**	

Textbook (only one):
Kenneth Rosen, Discrete Mathematics and its Applications, 7th Ed., McGraw-Hill, 2012

Reference Book (no more than 2) :
Seymour Lipschutz & Mark Lipson, Schaum's Outline of Discrete Mathematics, 3rd Ed., McGraw-Hill, 2009
Susanna Epp, Discrete Mathematics with Applications, 4th Ed., Thomson Learning, 2010.

Fourth Level Course Specification

Course Name	Digital systems Design		اسم المقرر باللغة العربية
			تصميم النظم الرقمية

Course Information	Course Code	Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105222	3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective
Level	4	Pre-requisite: 1105221	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Analyze and design combinational and sequential digital systems

2. Use different techniques, among them a hardware description language and a functional programming language, to design digital systems

3. Practically implement combinational and sequential digital systems

Course Description(brief):
This course presents the analysis and design of combinational circuits; adders, converters, subtractors, decoders, encoders, and multiplexers, Sequential circuits; flip- flops, level and edge triggering, derivation of the state table and state diagram. Registers, shift registers, and counters, RAM and programmable logic devices. Memory decoding and error correction schemes, Combinational and sequential programmable devices; ROMs, PLAs, PALs, CPLDs, and FPGAs, RTL representation of digital systems. ASM chart, ASMD chart, RTL representation, and HDL description. The design of a finite state machine to control a data path is presented in detail. HDL examples are given in gate- level, dataflow, and behavioral models to show the alternative ways available for describing digital systems in Verilog HDL.

Evaluation	☒ Periodic tests	☒ Project	☐ Quizzes	
	☒ Final-exam	☒ Lab	☐ Participation	

Textbook (only one):
M. Moris Mano and Michael D. Ciletti, Digital Design, 5th Ed., Elsevier, 2013

Reference Book (no more than 2):
Ronald Tocci, Neal Widmer, Digital Systems: Principles and Applications, 11th Ed., Pearson, 2014

Course Name	Programming Applications	اسم المقرر باللغة العربية
		تطبيقات البرمجة

Course Information	Course code	Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105212	3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective

Level	4	Pre-requisite: 1105211	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:

1. Employ good programming style, standards and practices, during program development
2. Organize separate source units properly, for larger programs
3. Recognize the use of the most data types and their proper use in useful applications
4. Adapt programming experience and language knowledge to the future courses

Course Description(brief) :
To enhance the proficiency in computer programming of the students, this course extends the study of computer programming developed in the previous course. The focus is on medium size programming applications of varying domains and complexity, using C with its most used features. A team project assignment is required to develop good programming style of students and their knowledge experience in programming useful applications.

Evaluation	☒ Periodic tests	☒ Project		☐ Quizzes	
	☒ Final-exam	☒ Lab		☐ Participation	

Textbook (only one):
Greg Perry & Dean Miller, C Programming Absolute Beginner's Guide, 3rd Ed., Que Publishing, 2013

Reference Book (no more than 2):
K. N. King, C Programming: A Modern Approach, 2nd Ed., W. W. Norton, 2008

Course Name	Data Structures	اسم المقرر باللغة العربية
		هياكل البيانات

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105241		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective
Level	4	Pre-requisite: 1105211	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Understand how the data structures are allocated and used in memory.
2. Design and implement data structures including; lists, stacks, queues, trees and graphs.
3. Select the appropriate data structure for a given problem.
4. Learn different searching and sorting algorithms.
5. Select the appropriate searching and sorting algorithms for a given application

Course Description(brief) :
This course presents fundamental concepts in data structures and the algorithms used to manipulate them. The difference between static and dynamic data types is investigated. Linear dynamic data structures; linked lists, stacks, queues and nonlinear ones; trees and graphs are introduced. Algorithms manipulating data structure, like searching and sorting, hashing, memory allocation and file management are included.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Narasimha Karumanchi, Data Structures and Algorithms Made Easy, 2nd Ed.,2011

Reference Book (no more than 2):
 Mark Allen, Weiss, Data Structures & Algorithm Analysis in C++, Pearson, 2006.

Course Name	Theory of Computation			اسم المقرر باللغة العربية		
				النظرية الحسابية		

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105232		3		3	0	3

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective
Level	4	Pre-requisite: 1105231	Co-requisites (if any)	

Course Objectives:
By the end of this course the student will be able to:
1. Understand the capabilities and limitation of computational models

2. Distinguish solvable problem from unsolvable ones

3. Classify problems according to their computational difficulty

Course Description(brief):
This course introduces the fundamental mathematical models of computation. The course presents both inherent capabilities and limitations of these computational models as well as their relationships with formal languages. Topics to be covered include: Finite automata and regular languages, Deterministic and nondeterministic computations, Context-free grammars, languages, and pushdown automata, Turing machines, recursive and recursively enumerable sets, introduction to computability and complexity theory.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☐ Lab		☐ Participation	

Textbook (only one):
George Tourlakis, Theory of Computation, 1st Ed., John Wiley & Sons, 2012

Reference Book (no more than 2):
1. John E. Hopcroft, Rajeev Motwani, and Jeffrey D. Ullman, Introduction to automata theory, languages, and computation, 3rd Ed., Addison-Wesley, 2006.

2. Michael Sipser, Introduction to the Theory of Computation, 2nd Ed., Course Technology, 2005

Fifth Level Course Specification

Course Name	Object Oriented Programming		اسم المقرر باللغة العربية			
			برمجة شيئية			

Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1105313		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective		
Level	5	Pre-requisite: 1105212	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:

1- Understand and implement search and sort algorithms

2- Use pointers and dynamically allocate storage

3- Design and use basic object-oriented programming techniques

4- Use inheritance, polymorphism and virtual functions

Course Description(brief):

This course presents a conceptual and practical introduction to imperative and object oriented programming, exemplified by Java. As well as providing grounding in the use of Java, the course will cover general principles of programming in imperative and object oriented frameworks. The course should enable you to develop programs that support experimentation, simulation and exploration in other parts of the computer science curriculum (e.g. the capacity to implement, test and observe a particular algorithm).

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☒ Participation	

Textbook (only one):
Sharon Zakhour et al., The Java Tutorial: A Short Course, 5th Ed., Addison-Wesley, 2013

Reference Book (no more than 2):
Joshua Bloch, Effective Java, 2nd Ed., Addison-Wesley, 2008

Course Name	Analysis & Design of Algorithms		اسم المقرر باللغة العربية		
			تحليل و تصميم الخوارزميات		

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105314		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective

Level	5	Pre-requisite: 1105241	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Apply asymptotic time complexity analysis to choose among competing algorithms.

2. Construct and solve recurrence equations describing the asymptotic time complexity of a given algorithm

3. Implement efficient searching and sorting algorithms

4. Identify similarities and difference between breadth-first and depth-first search techniques

5. Identify the use of dynamic programming techniques in algorithmic design

Course Description(brief) :
This course introduces students to the analysis and design of computer algorithms. Topics covered include; space and time complexities, asymptotic notations, design and analysis of basic classes of algorithms: traversal algorithms, divide and conquer greedy method, dynamic programming, basic tree and graph search and traversal techniques, backtracking; introduction to the theory of NP completeness.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Cormen, Leiserson, Rivest, and Stein, Introduction to algorithms, 3rd ED., MIT Press, 2009.

Reference Book (no more than 2) :
Anany Levitin, Introduction to the Design & analysis of algorithms, Addison Wesley, 2006.

Course Name	Computer Architecture	اسم المقرر باللغة العربية
		معمار الحاسب

Course Information	Course Code		Credit Units		Contact Hours	Lect.	Pr./Tu.	Tot.
	1105323		3			2	3	5

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	5	Pre-requisite: 1105222	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1. Explain the internal structure of computer systems

2. Recognize different types of architectures and the difference between computer architecture and organization

3. Apply the various performance measures to compare between different computer systems

4. Recognize different techniques used in the design of computer system components

Course Description(brief):

This course is to introduce students to the basic concepts and various techniques of computer architecture. Topics to be covered include: ALU design, IEEE 754 format for floating-point numbers, coprocessors, design of hardwired CU and micro-programmed CU, the characteristics of instruction sets, pipelines techniques, the architecture of RISC and CISC machine, (cache) high speed memories, I/O channels and I/O processors, parallel processing.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):

John L. Hennessy and David A. Patterson, Computer Architecture: A Quantitative Approach, 5th Ed., 2011

Reference Book (no more than 2) :

David A. Patterson, Computer Organization and Design, 5th Ed., Morgan Kaufmann Series in Computer Architecture and Design, 2013

Course Name	Database Systems		اسم المقرر باللغة العربية
			نظم قواعد البيانات

Course Information	Course Code	Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105342	3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	5	Pre-requisite: 1105212	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1- Understand the databases characteristics, and modeling

2- Explain database design concepts.

3- Design a database system for a real-world problem

4- Implement and verify a database system using the available DBMS software.

Course Description(brief) :

This course introduces the fundamental concepts necessary for modeling, designing, using, and implementing database systems. It includes ER model, relational model and algebra, SQL, normalization, functional dependencies, Introduction to EER, Introduction to DBMS, provide an in-depth and up-to-date presentation of the most important aspects of database systems and related technologies.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☒ Participation	

Textbook (only one):

Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems, 6th Ed., Addison-Wesley, 2011

Reference Book (no more than 2) :

Hector Garcia-Molina, Jeffrey D. Ullman & Jennifer Widom, Database Systems: The Complete Book, 2nd Ed., Prentice Hall, 2009

Sixth Level Course Specification

Course Name	Web Programming			اسم المقرر باللغة العربية			
				برمجة الويب			

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105315		3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective
Level	6	Pre-requisite: 1105313	Co-requisites (if any)	

Course Objectives:
By the end of this course the student will be able to:

1. Write HTML files without using web generation tools

2. Specify the difference between client-side and server-side web programming

3. Master the basic syntax of JavaScript as a client-side scripting language

4. Develop dynamic web pages using JavaScript and describe how server-side scripts work

5. Install and administer an Apache Web Server in a UNIX environment

6. Know the syntax of PHP, use PHP to develop dynamic web sites and access a MySQL Database from a PHP script

Course Description(brief) :
This course introduces web programming and technologies, client-server model, web page design languages: HTML; XHTML; XML, scripting languages: VB script; Java script; Perl, Server side programs, common gateway interface (CGI) programs, the applet concept, characteristics of web servers hand link permission, file management capabilities of common server architectures, role of client computer, web protocols, Supporting tools for web site creation and management, developing internet information servers, design and building of an interactive web based application.

Evaluation	☒ Periodic tests		☒ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Robert W. Sebesta, Programming the World Wide Web,7th Ed., Addison Wesley, 2012

Reference Book (no more than 2):
Porter Scobey and Pawan Lingras, Web Programming and Internet Technologies, Jones & Bartlett Learning, 2012

Course Name	Artificial Intelligence			اسم المقرر باللغة العربية		
				ذكاء إصطناعى		

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105333		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective

Level	6	Pre-requisite: 1105232	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1. Appreciate the achievements of AI and the theory underlying those achievements

2. Write simple to intermediate programs written in AI programming languages.

3. Understand the basic issues of knowledge representation, blind and heuristic search, min-max, resolution, etc. that play an important role in AI programs

4. Know some of the more advanced topics of AI such as learning, natural language processing, robotics, and expert systems

Course Description(brief) :

This course offers an introduction to artificial intelligence covering mechanisms, models and algorithms to some typical AI applications as well. The course covers the following interesting topics: representing, solving AI problems in state space search, formalism, heuristics, connectionism, and specific AI problems such as vision, knowledge and reasoning, Logic, Inference, Knowledge based systems, reasoning with uncertain information, Planning and making decisions, Learning, AI applications and programming.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☐ Lab		☐ Participation	

Textbook (only one):
David L. Poole and Alan K. Mackworth, Artificial Intelligence: Foundations of Computational Agents , 2010

Reference Book (no more than 2) :
 Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach 3rd Ed. , 2009

Course Name	Computer Graphics		اسم المقرر باللغة العربية
			رسوميات الحاسب

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105351		3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	6	Pre-requisite: 1105313	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1. Understand the mathematics and algorithms design of computer graphics

2. Aware of the programming skills needed to develop computer graphics applications

3. Use at least one of the famous available computer graphics software packages

Course Description(brief) :

This course introduces Computer graphics systems with history and survey of computer graphics applications. It presents output devices, output primitives including points, lines, circles, area filling, and character generation. Attributes of output primitives, two dimensional transformations, windowing and clipping are investigated. Interactive input methods, Graphics Programming, OpenGL, geometric modeling are discussed.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):

Donald D. Hearn, M. Pauline Baker, Warren R. Carithers, Computer Graphics with Open GL 4th Ed., Prentice Hall, 2010

Reference Book (no more than 2) :

John F Hughes and all, Computer Graphics: Principles and Practice 3rd Ed., Addison-Wesley, 2013

Course Name	Operating Systems			اسم المقرر باللغة العربية			
				نظم التشغيل			

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105361		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective

Level	6	Pre-requisite: 1105323	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Understand the functionality of the operating system software including I/O drivers
2. Understand the organization of the operating system and how concurrent processes scheduling, memory management, and I/O are accomplished
3. Understand the flow of information in the operating system in relation to the computer and application software
4. Understand the methods of system security and models of protection

Course Description(brief):
This course demonstrates the history of the operating systems and provides knowledge of operating systems concepts. The course introduces the principles of processes including inter-process communication, process scheduling, deadlocks, the principles of input / output that includes I/O hardware and software, Memory and File systems management that includes swapping, paging, virtual memory, and page replacement algorithms

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Silberscatz, Galvin & Gagne, Operating Systems Concepts, 9th Ed., John Wiley, 2012

Reference Book (no more than 2):
1. Tanebaum, A.S, Modern Operating Systems, 4th Ed., Prentice Hall, 2014.

2. William, Stallings, Operating Systems: Internals and Design Principles, 7th Ed., Prentice Hall, 2011

Course Name	Local Area Networks			اسم المقرر باللغة العربية		
				شبكات الحاسب المحلية		

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105371		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective		
Level	6	Pre-requisite: 1105323	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1- Appreciate the importance of computer networks in human life

2- Identify different LAN standards and the corresponding practical designs

3- Identify each component of a LAN, its function and when to use it

4- Design LAN of Different types for suitable applications and adjust their performance

Course Description(brief) :
This course is mainly for LANs, introduces the definitions, goals, applications, classifications, reference models for computer networks: ISO-OSI and TCP/IP, in general and concentrates on LANs; background, topologies, transmission media, standards & classifications. MAC protocols; IEEE 802.3 MAC: Ethernet, IEEE 802.5 MAC: Token ring, IEEE 802.11 MAC: Wireless LANs, including transmission media options suitable for each MAC standard, and Connectivity using devices: repeaters, bridges, hubs, switches, and routers are also considered. The performance and suitable applications for each MAC standard is discussed.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Stallings, Local and Metropolitan Area Networks, 6th Ed., Pearson Education, 2008

Reference Book (no more than 2) :
1. Local Area Networks, Peter Hodson, 4th Ed., Thomson Learning, 2006

2. Kenneth C., Mansfield Jr., James L., Computer Networking from LANs to WANs: Hardware, Software and Security (Networking), 1st Ed., 2009

Seventh Level Course Specification

Course Name	Linear Algebra				اسم المقرر باللغة العربية		
					جبر خطى		
Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1104xxx		3		2	2	4
Track	☐ University Requirement		☐ College Requirement		☒ Core		☐ Elective
Level	7		Pre-requisite: 1104101		Co-requisites (if any)		

Course Objectives:
By the end of this course the student will be able to:
1- Learn the basic theory of linear algebra through Eigen values

2- Realize the wide applicability of linear algebra by examining applications

3- Learn some useful algorithms for linear systems

Course Description(brief):
Introduction to systems of linear equations: Gaussian elimination and Gauss- Jordan elimination for solving equations, Matrices: Operations on matrices, properties of matrix operations, inverse of a matrix, Determinant of a matrix: elementary row operations, properties of determinants, Cramer's rule. Vector spaces: Subspaces, linear combinations, linear independence, bases and dimensions, Rank of a matrix: the coordinates, change of bases, Linear transformations: Kernel, range, nullity of a linear transformation, linear transformations and matrices, symmetric matrices, Eigenvectors: introduction to Eigen values, Eigen vectors and Eigen spaces

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☐ Lab		☐ Participation	

Textbook (only one):
David C. Lay, Linear Algebra and Its Applications, 4th Ed., Addison Wesley, 2011

Reference Book (no more than 2):
Anton, I. Bivens, and S. Davis., Calculus, 8th Ed., John Wiley and Sons, 2005

Course Name	Computer Systems Programming	اسم المقرر باللغة العربية
		برمجة نظم الحاسب

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105462		3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	7	Pre-requisite: 1105313&1105323	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:

1. Understand the architecture of a hypothetical machine, its assembly language, macro language

2. Programming in assembly language

3. Understand the structure and design of assemblers, linkers and loaders

4. Understand the concepts and theory behind the implementation of high level programming languages

Course Description(brief):
This course is an introduction to computer system programming, machine architecture, machine language, assembly language, two pass assemblers, one pass assemblers, macro facilities, conditional macros, loaders and linkers. Introduction to formal languages, design of compilers and interpreters.

Evaluation	☒ Periodic tests		☒ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Leland L. Beck, System Software: An Introduction to Systems Programming, 4th Ed., Addison Wesley, Longman Inc., 2013.

Reference Book (no more than 2):
Richard Stevens, Advanced Programming in the UNIX® Environment, 3rd Ed., Addison-Wesley, 2013

Course Name	Software Engineering		اسم المقرر باللغة العربية
			هندسة البرمجيات

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105443		3		3	0	3

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	7	Pre-requisite: 1105342	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1. Understand how to analyze, design, implement and test large-scale software

2. Practice teamwork in developing software project

3. Introduce techniques and standard documents used in each stage of the software life cycle

4. Work within a standard development process, document process and product measurements

5. Utilize personal design and code reviews effectively, and propose improvements

Course Description(brief):

This course provides an introduction to software engineering disciplines with emphasis on software life cycle, System models, requirement specification, architecture requirements, software analysis and design, structured analysis, functional and objects oriented design, programming, testing and debugging, validation maintenance and modifications, software development tools, project estimation, costing and planning project control and development of team structures.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):

Ian Sommerville, Software Engineering, 9th Ed., Addison Wesley, 2010

Reference Book (no more than 2):

Roger Pressman, Software Engineering: A practitioner's Approach, 7th Ed., McGraw Hill, 2009

Course Name	Wide Area Networks	اسم المقرر باللغة العربية
		شبكات الحاسب الموسعة

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105472		3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	7	Pre-requisite: 1105371	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1- Identify the different switching techniques in computer networks and their characteristics

2- Understand the data link control protocols and how they affect the communication process

3- Know the pros and cons of WAN technologies and when to use each of them

4- Make Sub netting and IP addressing for a given TCP/IP networking environment

Course Description(brief) :

This course is mainly for studying WANs, it concentrates on Switching Techniques: circuit switching, message switching, packet switching (virtual circuit & datagram), Data link control Protocols: functions, flow control (stop & wait, go-back-n, selective repeat), Error control (LRC, VRC, CRC), High Level Data Link Control Protocol, WAN Technologies and their Characteristics: X.25, frame Relay, ISDN, ATM, SONET, Internet: TCP/IP model, Sub netting and IP addressing.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):

Larry L. Peterson , Bruce S. Davie, Computer Networks: A Systems Approach, 5th Ed., Morgan Kaufmann, 2013

Reference Book (no more than 2) :

1. Flood, Telecommunication Switching Traffic and Networks, Pearson, 2008

2. Kenneth C., Mansfield Jr., James L., Computer Networking from LANs to WANs: Hardware, Software and Security (Networking), 1st Ed., 2009

Course Name	Modeling and Simulation			اسم المقرر باللغة العربية النمذجة والمحاكاه		
Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1105491		3		2	3	5
Track	☐ University Requirement ☐ College Requirement				☐ Core ☒ Elective		
Level	7		Pre-requisite: 1105332&1105313		Co-requisites (if any)		

Course Objectives:
By the end of this course the student will be able to:

1- Understand the basic principles of the field of Modeling and Simulation

2- Use the modeling of queuing systems using Markov chains

3- Evaluate performance of queuing systems

4- Understand the different stages in building a discrete event simulation model

5- Use Simulation software package to study the behavior of real life problems

Course Description(brief) :
This course provides an introduction to modeling and simulation approaches, basic definitions, M&S paradigms and methodologies, applications, design processes, and human factors. Information literacy and research methods are addressed. Papers and oral presentations are required and allow the student to investigate different aspects of the discipline. The course provides a general conceptual framework for further M&S studies.

Evaluation	☒ Periodic tests		☒ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☒ Participation	

Textbook (only one):
Leemis and Park, Discrete-Event Simulation: A First Course, Prentice Hall, 2006.

Reference Book (no more than 2):
Severance, System Modeling and Simulation: An Introduction, Wiley, 2001
Averill M Low & W. David Kelton, Simulation Modeling and Analysis, 3rd Ed., McGraw -Hill, 2000

Course Name	Applied Numerical Methods	اسم المقرر باللغة العربية
		الطرق العددية التطبيقية

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105492		3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☒ Core	☐ Elective

Level	7	Pre-requisite: 1105332&1105313	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1. Understand numerical methods and errors of computers

2. Compare numerical methods based on error and efficiency criteria

3. Analyze errors and error propagation

4. Solve a systems of Linear and nonlinear equations

5. Apply numerical differentiation, integration, use interpolation and regression

Course Description(brief) :

This course introduces the principles of numerical methods and analysis of errors for computer scientists. Various types of errors and problems associated with computations are investigated. Some methods covered are: solving sets of linear equations; single nonlinear equations (Newton's, Bisection, False position and Secant methods); solving sets of nonlinear equations; interpolation and curve fitting (Taylor series, Lagrange interpolation and least squares); numerical differentiation and integration; numerical solution of single ordinary differential equations (Euler's and Runge-Kutta methods), set of ODE, single PDE.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☐ Lab		☒ Participation	

Textbook (only one):

Steven Chapra : Applied Numerical Methods With MATLAB: for Engineers & Scientists ,7th Ed, McGraw Hill, 2011

Reference Book (no more than 2) :

Burden, Richard L.; Faires, J. Douglas, Numerical Analysis, 9th Ed., SPRINGFIELD, 2010

Eighth Level Course Specification

Course Name	Compilers Construction		اسم المقرر باللغة العربية		
			بناء مترجمات البرامج		

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105463		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective		
Level	8	Pre-requisite: 1105462	Co-requisites:

Course Objectives:
By the end of this course the student will be able to:
1. Understand the techniques for implementing programming languages

2. Explain the specific techniques needed to build compilers

3. Write a complete compiler for a very simple high level programming language

Course Description(brief) :
This course introduces the main theories, algorithms and tools for compiler construction. It covers the topics: lexical analysis, (regular expressions and finite automata, scanning algorithms), syntax analysis (context-free grammar, top-down parsing algorithms), and semantic analysis (symbol tables, semantic rules, attribute grammars, type checking), run-time systems organization, code generation (intermediate code). The students are expected to write a complete compiler for a very simple high level programming language.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Anthony J. Dos Reis, Compiler Construction Using Java, JavaCC, and Yacc , Wiley-IEEE Computer Society Press, 2012

Reference Book (no more than 2):
1. Alfred V. , Monica S., Ravi S. and Jeffrey D., Compilers Principles, Techniques, and Tools, 2nd Ed. , 2006

2. David A Watt & Deryck F Brown, Programming Language Processors in Java: Compilers and Interpreters, Prentice Hall, 1st Ed., 2000

Course Name	Distributed Computing Systems	اسم المقرر باللغة العربية
		نظم الحوسبة الموزعة

Course Information	Course Code		Credit Units		Contact Hours	Lec.	Pr./Tu.	Tot.
	1105473		3			3	0	3

Track	☐ University Requirement ☐ College Requirement ☐ Core ☐ Elective

Level	8	Pre-requisite: 1105472	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1- Be aware with difficulties and problems in designing and developing distributed systems.

2- Be able to deal with design and development techniques of distributed systems.

3- Understand distributed file systems techniques.

4- Know distributed shared memory technology.

Course Description(brief) :

Introduction to distributed systems, distributed systems architecture, computer networks for distributed systems, distributed objects and remote invocation, distributed naming, distributed file systems, security, synchronization, distributed coordination and agreement, distributed transactions, distributed replication, distributed shared memory, case studies such as CORBA, MACH, DCOM, and GLOBE.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☒ Participation	

Textbook (only one):

George Coulouris, Distributed Systems: Consepts and Design, Addison Wesley, 5th Ed., 2011

Reference Book (no more than 2) :

1. Tanenbaum and Steen, Distributed Systems: Principles and Paradigms, 2nd edition, Prentice Hall, 2006.

2. Carlos A. Varela and Gul Agha, Programming Distributed Computing Systems: A Foundational Approach , MIT Press, 2013

Course Name	Graduation Project			اسم المقرر باللغة العربية			
				مشروع تخرج			

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105483		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☒ Core ☐ Elective

Level	8	Pre-requisite: 100 Cr. Hrs.	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
Work as a member in a team work

Apply the knowledge grasped along the previous semesters to:

- Study a problem

- Perform the analysis

- Determine the requirements

- Design the solution

- Implement the proposed solution

- Document the different phases of the project contribution

- Prepare for presenting his work and submit the final document of the project

Course Description(brief) :
The project team is expected to develop an application to solve a specific problem by applying previously learned concepts and methods during the previous courses. The student is typically expected to study the problem, perform the analysis, determine the requirements, and design the solution. The student will deliver a report at this stage. The second phase of the project is devoted to the implementation, documentation of the final project report and preparing for the presentation. The project topic may be provided by the department or by the student, subject to the department approval.

Evaluation	☐ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☐ Lab		☒ Participation	

Textbook (only one):
Should be determined by the Graduation Project Supervisor

Reference Book (no more than 2):
 Should be determined by the Graduation Project Supervisor

Course Name	**Distributed Database Systems**		اسم المقرر باللغة العربية
			نظم قواعد البيانات الموزعة

Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1105494		**3**		**2**	**3**	**5**

Track	☐ University Requirement	☐ College Requirement		☐ Core	☒ Elective
Level	**8**	Pre-requisite: 1105342&1105313		Co-requisites (if any)	

Course Objectives:
By the end of this course the student will be able to:

1- Understand the fundamental issues in distributed systems with a strong emphasis on data management.

2- Understand topics ranging from Distributed transaction management and enhanced concurrency control to data replication and distributed query processing and optimization.

3- Develop different distributed information systems architectures such as cluster databases, federated database systems, parallel database systems.

Course Description(brief) :
The course introduces the fundamental issues in distributed database systems such as the theory, design, specification, implementation, and performance of distributed database systems, which are motivated by the computer networking, distribution of processors and database systems.

Evaluation	☒ **Periodic tests**		☒ **Project**		☒ **Quizzes**	
	☒ **Final-exam**		☒ **Lab**		☒ **Participation**	

Textbook (only one):
Tamer Öszu and Patrick Valduriez, Principles of Distributed Database Systems, 3rd Ed., Springer, 2011

Reference Book (no more than 2):
Saeed Rahimi & Frank S, Haug, Distributed Database Management Systems: A Practical Approach, Wiley-IEEE, 2010.

Course Name	Database Management Systems	اسم المقرر باللغة العربية
		نظم إدارة قواعد البيانات

Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1105495		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☐ Core ☒ Elective

Level	8	Pre-requisite: 1105342&1105313	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1- Understand the different issues involved in the design and implementation of a database system.
2- Understand essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server).
3- Design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Course Description(brief) :
The course introduces Database Management Systems with concentration on the principles, design, implementation and applications of database management systems.

Evaluation	☒ Periodic tests		☒ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☒ Participation	

Textbook (only one):
Philip J. Pratt, and Joseph J. Adamski, Concepts of Database Management, 7th Ed., Cengage Learning, 2011.

Course Name	Data Mining			اسم المقرر باللغة العربية			
				التنقيب في البيانات			

Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1105496		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☐ Core ☒ Elective		
Level	8	Pre-requisite: 1105342&1105313	Co-requisites (if any)

Course Objectives:

By the end of this course the student will be able to:

1- Understand basic concepts and principles of data mining and data warehousing.

2- Understand state-of-art approaches and techniques in data mining.

3. Develop a working application using a commercial data mining/data warehousing software tool.

Course Description(brief) :

The course explores basic concepts, principles and techniques of data mining, online analytic processing and data warehousing with emphasis on both the technical and the practical issues. The course provides students with an understanding in evaluating and comparing data mining solutions for effective use of the solutions in practice. The course also equips students with some hands-on experience and skills in conducting a data mining project using a data mining software tool, and/or constructing a data warehouse.

Evaluation	☒ Periodic tests		☒ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☒ Participation	

Textbook (only one):

Jiawei Han, Micheline Kamber, and Jain Pei, Data Mining Concepts and Techniques, 3rd Ed., Morgan Kaufmann, 2012

Reference Book (no more than 2):

1- Data Mining: Practical Machine Learning Tools and Techniques, 3rd Ed., Morgan Kaufmann, 2011

2- Gordon S. Linoff and Michael J. A. Berry, Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management, 3rd Ed., Wiley, 2011

Course Name	Pattern Recognition		اسم المقرر باللغة العربية
			تمييز الأنماط

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105497		3		2	3	5

Track	☐ University Requirement ☐ College Requirement ☐ Core ☒ Elective

Level	8	Pre-requisite: 1105333&1105313	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:

1. Design systems and algorithms for pattern recognition

2. Analyze classification problems probabilistically and estimate classifier performance

3. Understand and analyze methods for automatic training of classification systems

4. Apply Maximum-likelihood parameter estimation in relatively complex probabilistic models

5. Understand the principles of Bayesian parameter estimation and apply them in relatively simple probabilistic models

Course Description(brief):
This course introduces the basic concepts in the pattern recognition field. It will cover Bayesian decision theory, maximum likelihood estimation, nonparametric estimation, linear discriminate functions, support vector machines, unsupervised learning and clustering.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
Theodoridis, S. and K. Koutroumbas, Pattern recognition. 4th ED ed., Academic Press, 2009

Reference Book (no more than 2):
C. Bishop, Pattern Recognition and Machine Learning, Springer, 2006

Course Name	Human Computer Interaction	اسم المقرر باللغة العربية				
		تفاعل الإنسان مع الحاسب				

Course Information	Course Code		Credit Units	Contact Hours	Lec.	Pr./Tu.	Tot.
	1105498		3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☐ Core	☒ Elective

Level	8	Pre-requisite: 1105333&1105313	Co-requisites (if any)

Course Objectives:
By the end of this course the student will be able to:
1. Apply a variety of interaction design processes and techniques and know when they are appropriate

2. Examine an interactive product and explain what is good and bad about it in terms of the concepts, goals, and principles of interaction design.

3. Apply usability evaluation methods and know when they are appropriate.

4. Understand the role of social dynamics in interaction and how it applies in design, including concerns such as privacy, power, and accessibility.

Course Description(brief):
Introduction to HCI, The Human User Capabilities and Limitations, The Computer Capabilities and Limitations, Models of Interaction and Interaction Styles. Usability Principles, Principles of HCI that support user friendliness, Interface design: dialog notation and design; Visual Design, Design support, Systems that support the design process, Usability Evaluation, Introduction to Speech Computing and other Forms of Input / Output.

Evaluation	☒ Periodic tests		☐ Project		☐ Quizzes	
	☒ Final-exam		☒ Lab		☒ Participation	

Textbook (only one):
Steven Heim, The Resonant Interface: HCI Foundations for Interaction Design, Addison-Wesley, 2008

Reference Book (no more than 2) :
Cooper, A. & Riemann, R. About Face 2.0: The Essentials of Interaction Design, John Wiley & Sons, 2003

Course Name	Natural Language Processing	اسم المقرر باللغة العربية
		معالجة اللغات الطبيعية

Course Information	Course Code		Credit Units	Contact Hours	Lect.	Pr./Tu.	Tot.
	1105499		3		2	3	5

Track	☐ University Requirement	☐ College Requirement	☐ Core	☒ Elective
Level	8	Pre-requisite: 1105333&1105313	Co-requisites (if any)	

Course Objectives:
By the end of this course the student will be able to:

1. Understand the fundamental algorithms of NLP such as Viterbi algorithm, inside-outside, chart-based parsing and generation

2. Analyze, assess and justify which algorithms are most appropriate for solving a given NLP problem

3. Select a corpus and an annotation scheme for an NLP problem and justify the choice over other candidates

4. Identify suitable evaluation measures for an NLP problem and provide a written explanation of the role of annotated corpora

Course Description(brief):
This course will cover formal models for representing and analyzing syntax and semantics of words, sentences, and discourse. Students will learn how to analyze sentences algorithmically, using hand-crafted and automatically induced Treebank grammars, how to make monotonic syntactic derivations, and build interpretable semantic representations. The course will also cover a number of standard algorithms that are used throughout language processing. Examples include Hidden Markov Models, the EM algorithm, and state space algorithms such as dynamic programming.

Evaluation	☒ Periodic tests		☐ Project		☒ Quizzes	
	☒ Final-exam		☒ Lab		☐ Participation	

Textbook (only one):
S.Bird, E.Klein & E.Loper, Natural Language Processing with Python, O'Reilly, 2009

Reference Book (no more than 2):
Jurafsky and Martin, Speech and Language Processing, 2nd Ed., Prentice Hall, 2008

Appendices & Attachments

Attachment (1)

Scanning Mechanism of Chosen Programs (Similar Programs)

Scanning Mechanism of Selected Programs (Similar Programs)

Comparison Between Similar Programs		KING ABDULAZIZ UNIVERSITY First program		KING SAUD UNIVERSITY Second program		KING FAHD UNIVERSITY Third program		AMERICAN UNIVERSITY IN CAIRO Fourth program		NORTHERN BORDERS UNIVERSITY Current Program	
		Units	Courses	Units	Courses	Units	Courses	Units	Courses	Units	Courses
Total of Program Units & Courses		140	51	132	45	131	51	132	45	133	46
Distribution of Units & Courses on :		Units	Courses	Units	Courses	Units	Courses	Units	Courses	Units	Courses
University Requirements	Obligatory	36	15	31	9	31	10	30	10	6	3
	Elective	6	2	8	4	--	--	--	--	4	2
College Requirements	Obligatory	10	3	16	5	51	18	40	14	21	6
	Elective	3	1	8	4	--	--	--	--	0	0
Specialization Requirements	Obligatory	60	21	44	14	47	14	42	14	68	23
	Elective	13	4	18	6	12	4	18	6	9	3
	Project	4		6		3		2		3	
Free Elective Courses		6		--		12		15		6	
Field Training		0		1		0		0		0	
Technical Aspect											

Benchmarks Selected for the Formulation of the Current Program

Benchmark Selected for the Formulation of the Current Program

	Name of Parallel Program	University	College	Department	Country	Program International Ranking	Program Accrediting Body	Degree Awarded at Program Completion	Tracks Available within Program	Diplomas Available within Program
1st Pro.	Computer Science	KING ABDULAZIZ UNIVERSITY	Faculty of Computing & Information Technology	Computer Science	KSA	--	NCAAA ABET	B. Sc. Computer Science		—
2nd Pro.	Computer Science	KING SAUD UNIVERSITY	College of Computer and Information Sciences	Computer Science	KSA	--	NCAAA ABET	B. Sc. Computer Science		—
3rd Pro.	Information & Computer Science	KING FAHD UNIVERSITY for PETROLEUM & MINERALS	College of Computer Science and Engineering	Information & Computer Science	KSA	--	NCAAA ABET	B. Sc. Computer Science		—
4th Pro.	Computer Science	AMERICAN UNIVERSITY IN CAIRO	School of Sciences & Engineering	Computer Science & Engineering	ARE & World wide	--	ABET	B. Sc. Computer Science		—

Attachment (2)
مرفق (2)

سمات ومواصفات خريج برنامج علوم الحاسبات

ينبغي أن يكون الحاصلون على شهادة بكالوريوس العلوم فى علوم الحاسبات قد أثبتوا ما يلي:

- المعرفة بمجموعة شاملة ومتناسقة ومنظَّمة من المعارف في مجال علوم الحاسبات، وبالنظريات والمباديء المتعلقة بذلك المجال.
- القدرة على البحث في المشكلات المعقدة وإيجاد حلول ابتكارية تحت قدر محدود من التوجيه ، باستخدام رؤى من مجال دراستهم لبرنامج علوم الحاسبات و من المجالات الأخرى ذات العلاقة.
- القدرة على تحديد واستخدام الأساليب الرياضية والإحصائية المناسبة في التحليل وإيجاد الحلول للقضايا المعقدة ، والقدرة على اختيار واستخدام أكثر الآليات مناسبة لإيصال النتائج إلى المتلقين المختلفين.
- القدرة على القيادة والاستعداد للتعاون الكامل مع الآخرين في المشاريع والمبادرات المشتركة.
- الإلمام بمجال واسع و متكامل من المعارف والمهارات المطلوبة للممارسة الفعالة في مجال علوم الحاسبات.
- المبادرة في تحديد المشكلات والقضايا و إيجاد الحلول لها في المواقف الفردية والجماعية، وممارسوا القيادة لإيجاد حلولٍ عملية ومبتكرة.
- تطبيق المُدركات النظرية وأساليب الاستقصاء المكتسبة من مجال علوم الحاسبات في معالجة القضايا والمشكلات ضمن سياقات مختلفة.
- إدراك طبيعة التغير السريع في المعلومات في مجال علوم الحاسبات، والقدرة على مراعاة ذلك عند دراسة القضايا الأكاديمية أو المهنية واقتراح الحلول لها.
- المشاركة في الأنشطة بهدف مواكبة أحدث التطورات في مجالات علوم الحاسبات الأكاديمية أو المهنية مع الإستمرار في تعزيز معارفهم وفهمهم الذاتي.
- إظهار مستوى عالٍ من الأخلاقيات وإنضباط السلوك و إبداء روح القيادة في الأوساط الأكاديمية والمهنية والاجتماعية.
- التصرف بطرق تتوافق مع القيم و المعتقدات الإسلامية، وتعكس مستوياتٍ عالية من الإخلاص و تحمل المسؤولية و الالتزام تجاه خدمة المجتمع.

Attachment (3)
مرفق (3)
اللوائح التنظيمية الخاصة بوضع الدرجات وتوزيعها

● المادة الثانية والعشرون : الاختبارات النهائية
يحدد مجلس الكلية التي يتبعها المقرّر – بناء على اقتراح مجلس القسم – درجة للأعمال الفصلية لا تقل عن (30%) من الدرجة النهائية للمقرر.

القاعدة التنفيذية لجامعة الحدود الشمالية :
يحدد مجلس الكلية التي يتبعها المقرر بناء على اقتراح مجلس القسم درجة الأعمال الفصلية ما بين (40%) إلى (60%) من الدرجة النهائية للمقرر

● المادة الثالثة والعشرون:
تحتسب درجة الأعمال الفصلية للمقرر بإحدى الطريقتين الآتيتين:
أ‌- الاختبارات الشفهية أو العملية أو البحوث أو أنواع النشاط الصفي الأخرى أو منها جميعاً أو من بعضها واختبار تحريري واحد على الأقل.
ب‌- اختبارين تحريريين على الأقل.

● المادة الرابعة والعشرون:
يجوز لمجلس الكلية التي يتبعها المقرر – بناء على توصية مجلس القسم – أن يُضمّن الاختبار النهائي في أي مقرر اختبارات عملية أو شفوية، ويحدد الدرجات التي تخصص لها من درجات الاختبار النهائي.

● المادة الخامسة والعشرون:
يجوز لمجلس القسم الذي يتولى تدريس المقرر بناء على توصية مدرس المادة السماح للطالب باستكمال متطلبات أي مقرر في الفصل الدراسي التالي و يرصد للطالب في سجله الأكاديمي تقدير غير مكتمل (ل) أو (IC) و لا يحسب ضمن المعدل الفصلي أو التراكمي إلا التقدير الذي يحصل عليه الطالب بعد استكمال متطلبات ذلك المقرر، و إذا مضى فصل دراسي واحد ولم يُغير تقدير غير مكتمل (ل) أو (IC) فيسجل الطالب لعدم استكماله فيتبدل به تقدير راسب (هـ) أو (F) ويحسب ضمن المعدل الفصلي و التراكمي.

● المادة السادسة والعشرون:
يجوز استثناء مقررات الندوات والأبحاث والمقررات ذات الصبغة العملية أو الميدانية من أحكام المواد (22، 23، 24) أو بعضها، وذلك بقرار من مجلس الكلية بناء على توصية مجلس القسم الذي يتولى تدريس المقرر، ويحدد مجلس الكلية قياس تحصيل الطالب في هذه المقررات.

● المادة السابعة والعشرون:

إذا كانت دراسة مقررات الأبحاث تتطلب أكثر من فصل دراسي فيرصد للطالب تقدير مستمر (م) أو
(IP)، وبعد انتهاء الطالب من دراسة المقرر يمنح التقدير الذي حصل عليه، وإذا لم يستكمل المقرر
في الوقت المحدد فيجوز لمجلس القسم الذي يتولى تدريسه الموافقة على رصد تقدير غير مكتمل
(ل) أو (IC) فيسجل الطالب.

● المادة الثامنة والعشرون:

تحسب التقديرات التي يحصل عليها الطالب في كل مقرر كما يلي:

وزن التقدير من (4)	وزن التقدير من (5)	رمز التقدير	التقدير	الدرجة المئوية
4,00	5,00	أ +	ممتاز مرتفع	95 – 100
3,75	4,75	أ	ممتاز	90 إلى أقل من 95
3,50	4,50	ب +	جيد جداً مرتفع	85 إلى أقل من 90
3,00	4,00	ب	جيد جداً	80 إلى أقل من 85
2,50	3,50	ج +	جيد مرتفع	75 إلى أقل من 80
2,00	3,00	ج	جيد	70 إلى أقل من 75
1,50	2,50	د +	مقبول مرتفع	65 إلى أقل من 70
1,00	2,00	د	مقبول	60 إلى أقل من 65
0	1,00	هـ	راسب	أقل من 60

القاعدة التنفيذية لجامعة الحدود الشمالية :

تحسب التقديرات التي يحصل عليها الطالب في كل مقرر كما يلي:

وزن التقدير من (5)	رمز التقدير	التقدير	الدرجة المئوية
5,00	أ +	ممتاز مرتفع	95 – 100
4,75	أ	ممتاز	90 إلى أقل من 95
4,50	ب +	جيد جداً مرتفع	85 إلى أقل من 90
4,00	ب	جيد جداً	80 إلى أقل من 85
3,50	ج +	جيد مرتفع	75 إلى أقل من 80
3,00	ج	جيد	70 إلى أقل من 75
2,50	د +	مقبول مرتفع	65 إلى أقل من 70
2,00	د	مقبول	60 إلى أقل من 65
1,00	هـ	راسب	أقل من 60

● المادة التاسعة والعشرون:

يكون التقدير العام للمعدل التراكمي عند تخرج الطالب بناء على معدله التراكمي كالآتي:

1- (ممتـاز): إذا كان المعدل التراكمي لا يقل عن 4,50 من 5,00 أو 3,50 من 4,00.

2- (جيد جداً): إذا كان المعدل التراكمي من 3,75 إلى أقل من 4,50 من 5,00 أو من 2,75 إلى أقل من 3,50 من 4,00.

3- (جيــد): إذا كان المعدل التراكمي من 2,75 إلى أقل من 3,75 من 5,00 أو من 1,75 إلى أقل من 2,75 من 4,00.

4- (مقبـول):إذا كان المعدل التراكمي من 2,00 إلى أقل من 2,75 من 5,00 أو 1,00 إلى أقل من 1,75 من 4,00.

- القاعدة التنفيذية لجامعة الحدود الشمالية :

يكون التقدير العام للمعدل التراكمي عند تخرج الطالب بناءً على معدله التراكمي كالآتي:

1- (ممتـاز): إذا كان المعدل التراكمي لا يقل عن 4,50.

2- (جيد جداً): إذا كان المعدل التراكمي من 3,75 إلى أقل من 4,50.

3- (جيــد): إذا كان المعدل التراكمي من 2,75 إلى أقل من 3,75.

4- (مقبـول): إذا كان المعدل التراكمي من 2,00 إلى أقل من 2,75.

● المادة الثلاثون:

تمنح مرتبة الشرف الأولى للطالب الحاصل على معدل تراكمي من (4,75) إلى (5,00) من (5,00) أو من (3,75) إلى (4,00) من (4,00) عند التخرج، وتمنح مرتبة الشرف الثانية للطالب الحاصل على معدل تراكمي من (4,25) إلى أقل من (4,75) من (5,00) أو من (3,25) إلى أقل من (3,75) من (4,00) عند التخرج.

ويشترط للحصول على مرتبة الشرف الأولى أو الثانية ما يلي:

1- ألا يكون الطالب قد رسب في أي مقرر درسه في الجامعة أو في جامعة أخرى.

2- أن يكون الطالب قد أكمل متطلبات التخرج في مدة أقصاها متوسط المدة بين الحد الأدنى و الحد الأقصى للبقاء في كليته.

3- أن يكون الطالب قد درس في الجامعة التي سيتخرج منها ما لا يقل عن (60%) من متطلبات التخرج.

- القاعدة التنفيذية لجامعة الحدود الشمالية :

تمنح مرتبة الشرف الأولى للطالب الحاصل على معدل تراكمي من (4,75) إلى (5,00) عند التخرج، وتمنح مرتبة الشرف الثانية للطالب الحاصل على معدل تراكمي من (4,25) إلى أقل من (4,75) عند التخرج مع استيفاء شروط اللائحة .

● المادة الحادية والثلاثون:-

يجوز لمجلس الكلية تكوين لجنة تتعاون مع الأقسام في تنظيم أعمال الاختبار النهائي، وتكون مهامها مراجعة كشف رصد الدرجات وتسليمها للجنة المختصة خلال مدة لا تزيد عن ثلاثة أيام من تاريخ اختبار أي مقرر.

● المادة الثانية والثلاثون:-
يجوز لمجلس الكلية أن يقرر تطبيق السرية في إجراءات الاختبارات النهائية.

● المادة الثالثة و الثلاثون
يضع مدرس المقرر أسئلة الاختبار ، و يجوز عند الاقتضاء بناء على اقتراح رئيس القسم أن يضعها من يختاره مجلس الكلية.

● المادة الرابعة و الثلاثون
يصحح مدرس المقرر أوراق الاختبار النهائي لمقرره، و يجوز لرئيس القسم (عند الحاجة) أن يشرك معه متخصصاً أو أكثر في التصحيح، و يجوز لمجلس الكلية عند الضرورة أن يسند التصحيح إلى من يراه.

● المادة الخامسة و الثلاثون
يرصد من يقوم بتصحيح الاختبار النهائي الدرجات التي يحصل عليها الطلاب ي كشوف رصد الدرجات المعدة لذلك، ويوقع عليها ، ثم يصادق عليها رئيس القسم.

● المادة السادسة و الثلاثون
لا يجوز اختبار الطالب في أكثر من مقررين في يوم واحد ، و لمجلس الجامعة الاستثناء من ذلك.

● المادة السابعة و الثلاثون
لا يسمح للطالب بدخول الاختبار النهائي بعد مضي نصف ساعة من بدايته، كما لا يسمح له بالخروج من الاختبار قبل مضي نصف ساعة من بدايته.

● المادة الثامنة و الثلاثون
الغش في الاختبار أو الشروع فيه أو مخالفة التعليمات و قواعد إجراء الاختبار أمور يعاقب عليها الطالب وفق لائحة تأديب الطلاب التي يصدرها مجلس الجامعة.

● المادة التاسعة و الثلاثون
لمجلس الكلية التي تتولى تدريس المقرر، في حالات الضرورة، الموافقة على إعادة تصحيح أوراق الإجابة خلال فترة لا تتعدى بداية اختبارات الفصل التالي.

ضوابط تعديل الدرجات و إعادة تصحيح أوراق إجابات الاختبارات :
1- يجوز لعمادة القبول والتسجيل تعديل الدرجات لأي طالب بناء على خطاب من عميد الكلية التي تدرس المقرر مبني على قرار لجنة ثلاثية مشكلة برئاسة وكيل الكلية وعضوية كل من رئيس القسم المختص و أستاذ المادة ذات العلاقة موضحاً به أسباب طلب تعديل الدرجات.
2- يتم تعديل درجات الطلاب عن الفصل الدراسي خلال فترة لا تتجاوز الشهر الأول من بداية الفصل الدراسي الذي يليه.
3- في حالة شك الطالب بصحة الدرجة الممنوحة له يجب تباع ما يلي :

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أ- يراجع الطالب أستاذ المادة للتأكد من درجته ، و يقوم أستاذ المادة بمراجعة ورقة الطالب ، فإذا اتضح أن هناك حاجة إلى تعديل الدرجة يقوم برفع ذلك إلى رئيس القسم المختص للعرض على اللجنة الثلاثية المختصة في إطار الخطوتين 1 و 2 أما إذا في حالة عدم الحاجة إلى تعديل الدرجة فيتم إفادة الطالب بعدم صحة شكه.

ب- إذا لم يقتنع الطالب فعليه أن يقوم بتقديم طلب بذلك إلى رئيس القسم المختص ويقوم رئيس القسم بدراسة الطلب فإذا أصر أستاذ المادة على موقفه يجوز لرئيس القسم تحويل ورقة الطالب لتصحيحها من قبل عضو هيئة تدريس آخر بنفس التخصص بالقسم و من ثم يعرض الموضوع على اللجنة الثلاثية المختصة لاتخاذ القرار المناسب وفقاً للخطوتين 1و2.

- المادة الأربعون

يحدد مجلس الكلية بناءً على توصية مجلس القسم المختص مدة الاختبار التحريري النهائي على ألاتقل عن ساعة و لا تزيد على ثلاث ساعات.

- المادة الحادية و الأربعون

مع عدم الإخلال بالأحكام الواردة في المواد من (31-40) يضع مجلس الجامعة التنظيمات الخاصة بإجراءات الاختبارات النهائية.

Attachment (4)
مرفق (4)

لائحة الإرشاد الأكاديمي

يعتبر الإرشاد الأكاديمي ركيزة من ركائز التعليم الجامعي في المملكة ، حيث أنه يهدف إلى توجيه الطلبة للحصول على أفضل النتائج والتكيف مع البيئة الجامعية واغتنام الفرص المتاحة لهم ،عن طريق تزويدهم بالمهارات الأكاديمية التي ترفع من مستوى تحصيلهم العلمي. ونظراً لأهمية الإرشاد الأكاديمي في كليات الجامعة فإنه يتعين تشكيل وحدة أو لجنة تكون متخصصة بالدعم و الإرشاد الأكاديمي.

*

مهام المرشد الأكاديمي:

* الإلمام بمواعيد التسجيل والحذف والإضافة المعلنة من قبل عمادة القبول والتسجيل.
* معرفة الخطة الدراسية للكلية ومتطلبات التخرج للطلبة .والتأكد من موافقة جدول الطالب أو الطالبة مع الخطة الدراسية للكلية .
* إعداد وتحديث ملف سجل الإرشاد الأكاديمي لكل طالب أو طالبة حيث يقوم المرشد بفتح ملف خاص لكل طالب أو طالبة بالمجموعة يشمل المواد المسجلة و مستوى درجات الطالب أو الطالبة فيها، ومشتملاً على المعدل التراكمي وكذلك محاضر الاجتماعات الدورية بين المرشد و الطالب أو الطالبة بالإضافة إلى أي تقارير أو إنذارات موجهه من مقرر المادة والتي من خلالها يمكن تقييم مستوى الطالب أو الطالبة.
* تنظيم مقابلات دورية (مرة على الأقل عند بداية كل فصل دراسي) مع كل طالب أو طالبة من الطلبة الذين يشرف عليهم بهدف:
- التعرف على أداء الطلبة في الفصل المنصرم.
- حث الطالب أو الطالبة وتشجيعه على المزيد من الاجتهاد والثناء عليه إذا كان متميزاً في بعض المقررات.
- مناقشة الصعاب إن وجدت والبحث عن الحلول المناسبة.
- مناقشة الخيارات المناسبة للطالب أو الطالبة في الفصل القادم (تسجيل أو حذف مقررات، رفع معدل، اختيار تخصص الخ ..).
* تقديم العون للطالب أو الطالبة في حالة وجود صعوبة في تسجيل أو تعارض بعض المواد .
* المتابعة الدقيقة لتحصيل الطالب أو الطالبة العلمي في المواد المسجل فيها وكتابة تقارير دورية وإرفاقها في الملف الخاص بالطالب أو الطالبة.
* مخاطبة أعضاء هيئة التدريس إذا كان مستوى الطالب أو الطالبة متدنياً.
* في حالة عدم مواظبة الطالب أو ضعف مستواه التحصيلي ، يقوم المرشد بتكثيف اللقاءات الدورية ومناقشة الطالب أو الطالبة بشكل دقيق عن الأسباب ومحاولة حلها أو الرفع بها إلى لجنة الإرشاد الأكاديمي.
* اكتشاف المواهب لدى الطلبة وتنميتها.
* مساعدة الطلبة على كيفية الاستفادة القصوى من موقع التعليم الإلكتروني في الكلية.
* حث الطلبة على المشاركة في الأنشطة الأكاديمية والأنشطة اللاصفية .
* يفضل عدم تغيير المرشد للطالب أو الطالبة منذ التحاقه حتى تخرجه
* لا يقوم عميد الكلية أو من ينيبه بالإمضاء على شهادة حسن السيرة والسلوك إلا بعد خطاب يصله

من المرشد الأكاديمي بان هذا الطالب أو الطالبة قد أنهى أو أنهت كافة المتطلبات.

• لابد من بناء علاقة صداقة أكاديمية بين المرشد والطالب أو المرشدة والطالبة لتذويب الفوارق بينهما.

• يفضل أن يكون دور المرشد كمستشار اجتماعي ووظيفي للطالب أو الطالبة لمعرفة ظروفه أو ظروفها الاجتماعية والمساعدة على استقرارها أو استقراره أو مستقبل الطالب أو الطالبة الوظيفي والمساهمة في فتح آفاق فرص العمل له أو لها أو التدريب أو مواصلة الدراسة العليا.

• تخصيص ساعات مكتبية لمقابلة الطلبة في مكتبه لمناقشة المشاكل التي تواجههم أثناء الدراسة.

• تعريف الطلبة بأهداف الكلية ورسالتها، وبرامجها التعليمية ، وأقسامها العلمية، ومجالات عمل خريجيها، وأوجه الرعاية والخدمات التي توفرها لطلبتها، كما يتم تبصيرهم وتوجيههم لاختيار التخصصات المناسبة التي تلاءم قدراتهم وإمكاناتهم.

• رفع تقرير دوري عن أداء الطلبة لوحدة الدعم والإرشاد الأكاديمي (قبيل نهاية الفصل الدراسي). يشمل التقرير الأداء الأكاديمي للطالب أو الطالبة(أحسن أم أسوأ من السابق) والإجراءات التي تمت لمعالجة الأداء الأسوأ.

• رفع تقرير عن المشاكل التي تحتاج إلي تدخل الوحدة أو إدارة الكلية.

• حث الطلبة وتشجيعهم على الاستفادة من المكتبة وإدارة الوقت بفعالية.

• تشجيع الطلبة على المذاكرة كمجموعات و الاستفادة من أقرانهم.

مسؤولية ودور الطالب أو الطالبة:
- يتحمل كامل المسؤولية عن أدائه الأكاديمي حيث أن الإرشاد الأكاديمي هو آلية للمساعدة.
- الاضطلاع على دليل الكلية وموقع على الشبكة العنكبوتية للتعرف على كل ما يحتاجه القسم والكلية والجامعة من متطلبات.
- الإلمام بتفاصيل التقويم الدراسي والمواعيد الحرجة التي تختص بالتسجيل والانسحاب والاعتذار الخ..
- معرفة مرشده الأكاديمي ومواعيد ساعاته المكتبية.
- مقابلة المرشد للتشاور حول الأهداف الدراسية والمهنية، والبرنامج والجدول الدراسي، والاستفسار عن كل الجوانب التي يرى فيها غموضاً.
- تنفيذ توصيات المرشد والمواظبة على مقابلة المرشد حسب المواعيد المتفق عليها.
- إخطار المرشد بأي متغيرات قد تؤثر في برنامجه أو أدائه الدراسي.

Attachment (5)
مرفق (5)
اللوائح التنظيميّة بتظلّمات الطلبة الخاصّة بالشؤون الأكاديميّة

• في حالة الشكوى في صحة الدرجة الممنوحة في مادة ما:

- يراجع الطالب أستاذ المادة للتأكد من درجته.
- مراجعة ورقة الإجابة من قبل عضو هيئة تدريس المادة.
- إذا اتضح أن هناك حاجة لتعديل الدرجة يقوم برفع ذلك إلى رئيس القسم أو مشرف القسم للعرض على اللجنة المختصة بالكلية برئاسة وكيل الكلية وعضوية كل من رئيس القسم المختص وأستاذ المادة من أجل أن تستكمل إجراءات تعديل الدرجة.
- يتم تعديل درجات الطلاب عن الفصل الدراسي خلال فترة لا تتجاوز الشهر الأول من بداية الفصل الذي يليه.
- في حال عدم الحاجة إلى تعديل الدرجة يتم إفادة الطالب/الطالبة بعدم صحة الشكوى.
- إذا لم يقتنع الطالب/الطالبة يقوم بتقديم طلب بذلك إلى رئيس القسم المختص ويقوم رئيس القسم بدراسة الطلب مع أستاذ المادة ، فإذا أصر الأستاذ على موقفه يجوز لرئيس القسم تحويل ورقة الاختبار لتصحيحها من قبل عضو هيئة تدريس آخر بنفس التخصص بالقسم و من ثم تعرض على اللجنة المختصة لاتخاذ القرار المناسب.

• في حالة الشكاوى الأخرى:

- يتم تشكيل لجنة لتلقي وفحص شكاوى الطلاب برئاسة إحدى أعضاء هيئة التدريس وعضو هيئة تدريس آخر من كل قسم علمي على أن تعرض الحالات التي ترد إليها للإحاطة أو اتخاذ الإجراء المناسب على لجنة التعامل مع شكاوي الطلاب (فرع الطلاب وفرع الطالبات) بصفة دائمة وشهريا ، أو وضعها في أحد صناديق الشكاوى الموجودة في كل كلية.
- يتم فتح صناديق الشكاوى وتجميع الشكاوى أسبوعيا.
- يتم إرسال الشكوى إلى من يعنيه الأمر بمجرد ورودها من الطلاب.
- يتم الفحص والبت في كل المشاكل التي يمكن التعامل معها بصورة ودية أو رسمية مع مراعاة السرية الكاملة للشكوى وسرعة البت في الشكوى.
- الشكاوى التي تحتاج الرد من الأقسام العلمية تُرفع إلى رؤساء الأقسام ويكون الرد عن طريق لجنة معتمدة من قبل القسم وتكون الشكوى سرية ، أي يحتفظ باسم الطالب وبياناته لدى لجنة الشكاوى في ملفات خاصة مع مراعاة ألا تزيد مدة الرد على الشكوى أكثر من خمسة عشر يوما.
- في حالة تعذر حل الشكوى عن طريق الأقسام تُرفع إلى عميد الكلية.
- تجمع اللجنة ردود الشكاوى وترسل بها إلى أصحابها (لذا ينبغي كتابة بيانات صاحب الشكوى وتشمل الاسم (اختياري)– الفرقة – المستوى - الشعبة، وكذلك وسيلة الاتصال به مثل: رقم التليفون – البريد الإلكتروني ، أو الاتفاق معه على موعد للرد على الشكوى) وذلك لضمان سرعة التواصل بين أعضاء اللجنة وصاحب الشكوى.

Attachment (6)
مرفق (6)

Operational Plan (Arar)

First: A list of Available Manpower

No.	Academic Rank or Position	Number Available
1	Professor	1
2	Associate Professor	0
3	Assistant Professor	7
4	Lecturer	12
5	Teacher Assistance	0
6	Teacher	0
7	Technician	0
8	Administrator	0

Second: The Department is Able to carry out the Plan and the Program—it needs the Following:

Academic Rank or Position	General Specialty	Specific Specialty	Number of posts Needed	Total
Professor	**Computer Science**	Compiler Theory	1	1
Associate Professor	**Computer Science**	Software Engineering	1	2
	Computer science	Algorithms	1	
Assistant Professor	**Computer Science**	Operating systems	1	3
	Computer Science	Computer Security	1	
	Computer Science	Computer Architecture	1	
Lecturer				0
Teacher Assistance				0
Teacher				0
Administrator				0

Laboratories and Facilities

Title of Laboratory (to be established/ already in place)	Required Equipment
Digital Logic Design	Already in place
Computer Networks	Already in place
Computer Graphics	To be established
Cisco Laboratory	Already in place
4 Windows Platform laboratories	Already in place
2 Unix Platform Laboratories	Already in place

Classrooms

Number of Classrooms	Required Seating Capacity
8	**30, already in place**
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