Al-Kafeel University

College of Technical Engineering

Computer Technology Engineering Department

Academic Program and Course Description Guide

2024

Academic Program Description Form

University Name: Al-Kafeel University
Faculty/Institute: Computer Techniques Engineering
Scientific Department: Computer Techniques

Academic or Professional Program Name: Bachelor of Computer Techniques Engineering

Final Certificate Name: Yearly

Academic System: Accreditation Board for Engineering and Technology (ABET)

Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name: Ali J. Rawdhan
Date: 02/03/2024

Signature:
Scientific Associate Name:
Date: 02/03/2024

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature: 2024

Approval of the Dean

1. Program Vision

1. Educational objectives: Determine the main objectives of the educational program, such as providing students with the basic knowledge and skills necessary in the fields of technical engineering, and developing their research and analytical capabilities.
2. Curricula and courses: Design comprehensive study programs that include a variety of core and elective courses covering various technical engineering fields such as mechanical engineering, electrical engineering, and civil engineering.
3. Active learning and practical application: Enhance practical experiences through advanced engineering laboratories, workshops, and applied projects that help students apply theoretical concepts in a practical environment.
4. Scientific research and innovation: Promoting a culture of scientific research and innovation by supporting academic research and technological projects that contribute to the development of new and innovative solutions.
5. Continuous learning and professional development: Providing continuous learning and professional development opportunities for faculty members and students to keep pace with technological and professional developments in the fields of engineering.

2. Program Mission

6. We aim to enhance our students' abilities to solve problems and innovate in various engineering disciplines.
7. Commitment to academic and moral excellence, and striving to prepare our students to be innovative leaders and effective contributors to the development of society and the local and global economy.

8. Providing a stimulating and supportive educational environment that encourages self-learning and innovation, which helps achieve our students' ambitions and develop their personal and professional capabilities.

9. Working to build a bright future for our students and the communities we serve through engineering and technology.

3. Program Objectives

A) Graduating engineering cadres in the field of computer engineering who are able to face all the difficulties and obstacles they face while working in the industrial and technological sectors by arming them with all the information, basics and secular facts that they need in their field of work in the field of computer engineering.

b) Striving to graduate engineers with different specializations in computer technology engineering who have the ability to be creative and innovative in various fields of engineering work after their graduation and to keep pace with the scientific and technological development taking place in the civilized world.

c) Preparing technical and engineering cadres in the field of computer engineering to learn about the most important scientific and technological developments and seek to benefit from them in community service and to develop students' teamwork skills.

4. Program Accreditation

Does not have program accreditation

5. Other external influences

Beneficiary satisfaction, Match learning and educational outcomes with the job market, Community service by the department and the extent of student participation in it.

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	3	6	%3	
College Requirements	–	–	–	–
Department Requirements	35	199	%97	
Summer Training	2	–	–	
Other	–			

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
the second			theoretical	practical
	2CTE1	Microprocessor architecture	2	3
	2CTE2	Devices and measurements	2	2
	2CTE3	Foundations of communications	1T+2	2
	2CTE4	Electronics	2	2
	2CTE5	Computer programming 2	2	2
	2CTE6	computer applications	1	2
	2CTE7	Mathematics 2	1T+2	-
	2CTE8	training	Interpolation	

Third Electronic branch	3CTEE1	**Fundamentals of control engineering**	2	2
	3CTEE2	**Engineering analyses**	2	2
	3CTEE3	**Industrial electronics**	2	2
	3CTEE4	**Design of real time systems**	2	2
	3CTEE5	**Numerical control**	2	2
	3CTEE6	**Digital signal processing**	2	2
	3CTEE7	**Optional subject**	2	2
	3CTEE8	**Electronic systems simulators**	1	2
	3CTEE9	**training**	Interpolation	Interpolation
Third Communications Branch	3CTEC1	**Foundations of computer networks**	2	2

	3CTEC2	**Fundamentals of control engineering**	2	2
	3CTEC3	**Digital communications**	2	2
	3CTEC4	**Engineering analyses**	2	2
	3CTEC5	**Design of real time systems**	2	2
	3CTEC6	**Digital signal processing**	2	2
	3CTEC7	**Optional subject**	2	2
	3CTEC8	**Computer network simulators**	1	2
	3CTEC9	**Training**	Interpolation	Interpolation
Fourth Electronic branch	4CTEE1	**Project Management**	2	2
	4CTEE2	**Advanced digital electronics**	2	2
	4CTEE3	**Design of computer adaptation circuits**	2	2
	4CTEE4	**Advanced computer technology**	2	2

	4CTEE5	**computer networks**	2	2
	4CTEE6	**Intelligent systems modeling**	2	2
	4CTEE7	**Optional subject**	2	2
	4CTEE8	**project**	-	4
Fourth Communications Branch	4CTEC1	**Project Management**	2	2
	4CTEC2	**Computer and network security**	2	2
	4CTEC3	**Mobile communications**	2	2
	4CTEC4	**Computer networking protocols**	2	2
	4CTEC5	**Multimedia computing**	2	2
	4CTEC6	**Information theory and coding**	2	2
	4CTEC7	**Optional subject**	2	2
	4CTEC8	**project**	-	4

8. Expected learning outcomes of the program

Knowledge

A. Knowledge and Understanding

A1. Acquire knowledge, understanding, principles, theories and basics of computer engineering.

A2. Understand the advanced modern scientific topics in the field of computer engineering.

A3. Examine the most important computer programs that are used in the field of solving engineering problems.

A4. The ability to understand the basics of the work of laboratory equipment.

Skills

B. Subject-specific skills

B1. Description and analysis of computer applications.

B2. In books, prove and discuss engineering rules and the foundations based on them.

B 3. Analyzes and discusses problems and finds effective solutions to them with the possibility of using specialized computer programs.

B4. Justify, convey and prove concepts, especially engineering concepts in the field of computer engineering.

9. Teaching and Learning Strategies

1- Theoretical lectures.

2- Discussion lectures.

3- Practical lectures in laboratories.

4- Scientific seminars by students.

5- Small educational group methods.

6- Graduation projects for completed stage students and their discussion.

Theoretical and practical lectures and presentation of information from various reputable scientific sources.

Presentation of scientific lectures using electronic output devices: data show, smart boards, television screens.

• Homework and mini projects within the lectures.

• Scientific laboratories.

• Graduation projects.

• Scientific visits.

• Scientific courses and seminars held in the department.
• Summer training.

10. Evaluation methods

1- Monthly or quarterly written exams.
2- Quizzes.
3- Writing scientific reports.
4- Scientific seminars.
5- Home duties.
6- Graduation projects discussion committees for outgoing students.

Students are tested orally and practically periodically to determine the extent of their comprehension of the scientific theories proposed.

Snap exams.
•Homework and mini-projects within the course.
•Quarterly and final exams for theoretical and practical subjects.
•Interaction within the lecture
• Reports theoretical and practical material.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof.		1			1	
Assist Prof.		1			1	
Lect.		5			5	
Assist Lect.		7			7	

Professional Development

Mentoring new faculty members

The students began to spread a culture of self-confidence and the ability to successfully skip the program if they loved the program and were keen to master it, and cooperated with each other and with the trainers.
The gradual transformation of self-reliance in learning the program.

Professional development of faculty members

Spreading a culture that the student's saying I did not understand is better than his silence on the lack of understanding, because the program is a series of interconnected tasks, each of which is a requirement for the next one, which means that any disruption means that the student stops throughout the year.
Adopting training and homework by installing the relevant programs on personal computers at home and allowing those who do not have a computer to visit the laboratory during their spare time, given the presence of the researcher's assistant daily inside the laboratory.
Enabling the student to manage the graduation research by himself through research procedures and experimental methods, and to retain those skills after graduation.

12. Acceptance Criterion

First: College admission requirements:

1. Adopting the admission requirements for students according to the regulations of the Ministry of Higher Education and Scientific Research (Central National Admission).
2. He must successfully pass any special test or personal interview deemed by the college or university council.
3. To pass the medical examination.

Second: Conditions for admission to the scientific department:

1. Choosing the student's desire from more than one desire, in order of preference.
2. The acceptance rate in high school.
3. The absorptive capacity of the scientific department.

13. **The most important sources of information about the program**
1- Market needs. 2- Local trends. 3- Studies and questionnaires. 4- Specialized seminars and workshops with the beneficiaries.

14. Program Development Plan
a. Identify specific development goals aimed at improving the program, such as enhancing students' practical skills or updating the curriculum to keep pace with technological developments. B. Updating the curriculum to include the latest developments in the fields of technical engineering. C. Introducing new courses covering emerging and evolving fields such as artificial intelligence, environmental engineering, and renewable energy. D. Developing practical workshop programs and applied projects that enhance students' understanding and abilities to solve real engineering problems. e. Develop and improve engineering laboratories and facilities to provide a stimulating educational environment. f. Providing the necessary resources to effectively support research and educational activities.

Program Skills Outline

Required program Learning outcomes

Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills								Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
The second	2CTE1	Microprocessor architecture	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	2CTE2	Devices and measurements	Basic	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
	2CTE3	Foundations of communications	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	2CTE4	Electronics	Basic	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
	2CTE5	Computer programming 2	Basic	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
	2CTE6	Calculator applications	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	2CTE7	Mathematics 2	Basic	*	*	*	*	*	*		*	*	*	*	*	*	*	*	

Program Skills Outline

Required program Learning outcomes

Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills								Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Third	3CTEC1	Foundations of computer networks	Basic	*	*	*	*	*	*			*	*	*		*	*	*	*
	3CTEC2	Fundamentals of control engineering	Basic	*	*	*	*	*	*	*	*	*	*			*	*	*	*
	3CTEC3	Digital communications	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	3CTEC4	Engineering analyses	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	3CTEC5	Design of real time systems	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	3CTEC6	Digital signal processing	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	3CTEC7	Database systems	Optional	*	*	*	*	*	*	*		*	*			*	*	*	
	3CTEC8	Computer network simulators	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Program Skills Outline																		
Required program Learning outcomes																		
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills								Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Fourth	4CTEE1	Project Management	Basic	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
	4CTEE2	Computer and network security	Basic																
	4CTEE3	Mobile communications	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4CTEE4	Computer networking protocols	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4CTEE5	Multimedia computing	Basic	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
	4CTEE6	Information theory and coding	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4CTEE7	Advanced computer technology	Optional	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Course Description Form

1. Course Name:	
Computer Networks Fundamentals	
2. Course Code:	
3CTEE1	
3. Semester / Year:	
Annually	
4. Description Preparation Date:	
30/5/2021	
5. Available Attendance Forms:	
Fulltime	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 h	
7. Course administrator's name (mention all, if more than one name)	
Name: Lect. D. Ahmed Ali Talib Email: ahmed.ali@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	Giving the student information on the basic concepts of linear control theory, analysis and design of linear control systems.
9. Teaching and Learning Strategies	
The strategy	1- Theoretical presentation of the curriculum vocabulary through the use of some general engineering principles, which lead to the analysis and design of the engineering problem, in addition to using the laws and rules of control engineering. (Get A1-A5 from Paragraph 9) 2- Class group discussions of practical examples of control systems. (Get A1 from Paragraph 9) 3- Laboratory application of the curriculum vocabulary using computer programs to represent

	and analyze systems, such as the Matlab program (obtaining B1-B4 from paragraph 9) To reach C1-C2 of Paragraph 9, the student is assigned to address a practical engineering problem related to control engineering, and during his study period, he presents appropriate solutions to analyze the origin of the problem, follow the theories and rules used to solve it, and present the results of the analysis and solutions and its economic and social impact. A1- He understands the requirements of the engineering profession and ethical responsibility in addition to the need for lifelong learning and the ability to engage in it. B2- Understand the impact of engineering solutions on economic activities

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	8	The student should be able to understand control systems and methods of representing and analyzing them.	Introduction To Control Systems, Open And Closed Loop System.	A theoretical presentation using illustrative diagrams and some general engineering principles	achievement test + class assignment
3-6	8		Mathematical modeling of physical systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
7-8	8		Block diagrams.	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
9-10	8		Time-domain analysis of closed loop control systems and error analysis	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment

10-12	8	A theoretical presentation using the laws and rules of control engineering.	P, PI, PD and PID Modes of Feedback Control, Realization of PID Controller Using Active and Passive Elements.	The student should be able to understand the impact of the work of the controllers on the control systems.	achievement test + class assignment
13-14	8		Stability analysis and Rouths stability Criterion	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
15-17	12	Theoretical presentation using the schemes, rules and laws of control engineering	Root Locus Technique.		achievement test + class assignment
18-20	12	Theoretical presentation using the schemes, rules and laws of control engineering	Analysis of control system in frequency domain and Bode Diagrams	The student should be able to analyze the balance of control systems and the ability to analyze the performance of the system in the time and frequency range. And that the student is able to design the control system.	achievement test + class assignment
21	4	Theoretical presentation using the schemes, rules and laws of control engineering	Design of control systems and Compensation concepts.		achievement test + class assignment
22-25	16	Theoretical presentation using the schemes, rules and laws of control engineering	Control system design using root locus method.	The student should be able to analyze the balance of control systems and the ability to analyze the performance of the system in the time and frequency range. And that the student is able to design the control system.	achievement test + class assignment
26-30	16	Theoretical presentation using the schemes, rules and laws of control engineering	Control system design using Bode Diagrams.		achievement test + class assignment

11. Course Evaluation

Theoretical presentation of the curriculum vocabulary through the use of some general engineering principles, which lead to the analysis and design of the engineering problem, in addition to using the laws and rules of control engineering.

The results are presented in class to be discussed and the rest of the students participate in the discussion.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	

Main references (sources)	1. K. Ogata, "Modern Control Theory Engineering", 4th Edition 2. R.C. Dorf & R.H. Bishop: "Modern Control Systems", 10th Edition, Prentice Hall, 2005. 3. C. Phillips & R. Harbor: "Feedback Control Systems", Prentice-Hall, 1996. 4. Franklin, Powell & Emami-Naeini: "Feedback Control of Dynamic Systems", Addison-Wesley, 1993.
Recommended books and references (scientific journals, reports…)	A number of electronic references and a number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Computer Networks Simulators	
2. Course Code:	
3CTEC8	
3. Semester / Year:	
Year	
4. Description Preparation Date:	
30/5/2021	
5. Available Attendance Forms:	
Mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 h	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Zainab Salam Abdel Shahid Email: zainab.salam@alkafeel.edu.iq	
8. Course Objectives	
jectives of the study subject	Giving the student information about the basic concepts in simulating the work of computer networks, through the use of different programs that simulate computer networks and building virtual networks that simulate reality
9. Teaching and Learning Strategies	
The strategy	1- Theoretical presentation of the curriculum vocabulary through the use of some general engineering principles, which lead to the analysis and design of the engineering problem, in addition to using the laws and rules of control engineering. (Get A1-A5 from Paragraph 9) 2- Class group discussions of practical examples of control systems. (Get A1 from Paragraph 9) 3- Laboratory application of the curriculum vocabulary using computer programs to represent and analyze systems, such as the Matlab program (obtaining B1-B4 from paragraph 9)

	To reach C1-C2 of Paragraph 9, the student is assigned to address a practical engineering problem related to control engineering, and during his study period, he presents appropriate solutions to analyze the origin of the problem, follow the theories and rules used to solve it, and present the results of the analysis and solutions and its economic and social impact. A1- He understands the requirements of the engineering profession and ethical responsibility in addition to the need for lifelong learning and the ability to engage in it. B2- Understand the impact of engineering solutions on economic activities.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	8	The student should be able to understand control systems and methods of representing and analyzing them.	Introduction To Control Systems, Open And Closed Loop System.	A theoretical presentation using illustrative diagrams and some general engineering principles	achievement test + class assignment
3-6	8		Mathematical modeling of physical systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
7-8	8		Block diagrams.	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
9-10	8		Time-domain analysis of closed loop control systems and error analysis	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
10-12	8	A theoretical presentation using the laws and rules of control engineering.	P, PI, PD and PID Modes of Feedback Control, Realization of PID Controller Using Active and Passive Elements.	The student should be able to understand the impact of the work of the controllers on the control systems.	achievement test + class assignment
13-14	8		Stability analysis and Rouths stability Criterion	A theoretical presentation using the laws and rules of	achievement test + class assignment

				control engineering.	
15-17	12	Theoretical presentation using the schemes, rules and laws of control engineering	Root Locus Technique.		achievement test + class assignment
18-20	12	Theoretical presentation using the schemes, rules and laws of control engineering	Analysis of control system in frequency domain and Bode Diagrams	The student should be able to analyze the balance of control systems and the ability to analyze the performance of the system in the time and frequency range. And that the student is able to design the control system.	achievement test + class assignment
21	4	Theoretical presentation using the schemes, rules and laws of control engineering	Design of control systems and Compensation concepts.		achievement test + class assignment
22-25	16	Theoretical presentation using the schemes, rules and laws of control engineering	Control system design using root locus method.	The student should be able to analyze the balance of control systems and the ability to analyze the performance of the system in the time and frequency range. And that the student is able to design the control system.	achievement test + class assignment
26-30	16	Theoretical presentation using the schemes, rules and laws of control engineering	Control system design using Bode Diagrams.		achievement test + class assignment

11. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

The results are presented in class to be discussed and the rest of the students participate in the discussion.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	[1] Behrouz ,A. Forouzan "Data communications and networking" 4th edition. [2] Theoddore. S. Rappaport ,"wireless communications " 2nd edition. [3] Vijay Garg ,"wireless communications and networking ". [4] Teerawat Issariyakul , and Ekram Hossain "introduction to network simulator NS2",2nd edition. [5] Gassan A. Abed ,"introduction to network simulation using NS-2".

Recommended books and references (scientific journals, reports…)	A number of electronic references and a number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Control Engineering Fundamentals	
2. Course Code:	
3CTEC2	
3. Semester / Year:	
Annually	
4. Description Preparation Date:	
30/5/2021	
5. Available Attendance Forms:	
Fulltime	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 h	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Israa Haider Hashem Email: issraa.hayder@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	Giving the student information on the basic concepts of linear control theory, analysis and design of linear control systems.
9. Teaching and Learning Strategies	
The strategy	1- Theoretical presentation of the curriculum vocabulary through the use of some general engineering principles, which lead to the analysis and design of the engineering problem, in addition to using the laws and rules of control engineering. (Get A1-A5 from Paragraph 9) 2- Class group discussions of practical examples of control systems. (Get A1 from Paragraph 9) 3- Laboratory application of the curriculum vocabulary using computer programs to represent and analyze systems, such as the

	Matlab program (obtaining B1-B4 from paragraph 9)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	8	ILOs	Introduction To Control Systems, Open And Closed Loop System.	A theoretical presentation using illustrative diagrams and some general engineering principles	achievement test + class assignment
3-6	8	The student should be able to understand control systems and methods of representing and analyzing them.	Mathematical modeling of physical systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
7-8	8		Block diagrams.	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
9-10	8		Time-domain analysis of closed loop control systems and error analysis	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
10-12	8		P, PI, PD and PID Modes of Feedback Control, Realization of PID Controller Using Active and Passive Elements.	The student should be able to understand the impact of the work of the controllers on the control systems.	achievement test + class assignment
13-14	8	A theoretical presentation using the laws and rules of control engineering.	Stability analysis and Rouths stability Criterion	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
15-17	12		Root Locus Technique.		achievement test + class assignment
18-20	12	Theoretical presentation using the schemes, rules and laws of control engineering	Analysis of control system in frequency domain and Bode Diagrams	The student should be able to analyze the balance of control systems and the ability to analyze the performance of the system in the time and frequency range. And that the student is able to design the control system.	achievement test + class assignment
21	4	Theoretical presentation using the schemes, rules and laws of control engineering	Design of control systems and Compensation concepts.		achievement test + class assignment

22-25	16	Theoretical presentation using the schemes, rules and laws of control engineering	Control system design using root locus method.	The student should be able to analyze the balance of control systems and the ability to analyze the performance of the system in the time and frequency range. And that the student is able to design the control system.	achievement test + class assignment
26-30	16	Theoretical presentation using the schemes, rules and laws of control engineering	Control system design using Bode Diagrams.		achievement test + class assignment

11. Course Evaluation

Theoretical presentation of the curriculum vocabulary through the use of some general engineering principles, which lead to the analysis and design of the engineering problem, in addition to using the laws and rules of control engineering. (Get A1-A5 from Paragraph 9)
Class group discussions of practical examples of control systems. (Get A1 from Paragraph 9)
Laboratory application of the curriculum vocabulary using computer programs to represent and analyze systems, such as the Matlab program (obtaining B1-B4 from paragraph 9)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. K. Ogata, "Modern Control Theory Engineering", 4th Edition 2. R.C. Dorf & R.H. Bishop: "Modern Control Systems", 10th Edition, Prentice Hall, 2005. 3. C. Phillips & R. Harbor: "Feedback Control Systems", Prentice-Hall, 1996. 4. Franklin, Powell & Emami-Naeini: "Feedback Control of Dynamic Systems", Addison-Wesley, 1993. Matlab
Recommended books and references (scientific journals, reports…)	A number of electronic references and a number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:
Database Systems
2. Course Code:
3CTEC7
3. Semester / Year:
Yearly
4. Description Preparation Date:
30/5/2021
5. Available Attendance Forms:
Face to Face and Electronic
6. Number of Credit Hours (Total) / Number of Units (Total)
120 Hours(1 Hours Theory+3 Hours Practical)
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Yahya Mahdi Hadi Email: yahya.almayali@alkafeel.edu.iq

8. Course Objectives	
Objectives of the study subject	After studying this course, the student is expected to be able to achieve the following objectives: 1. The course aims to introduce the student to the concepts of databases. 2. Introducing the student to electronic information sources and their relationship with databases. 3. To be able to analyze databases into their basic elements and components. 4. The student should distinguish the different types of databases

9. Teaching and Learning Strategies	
Strategy	Theoretical and practical lectures and presentation of information from various reputable scientific source. Theoretical lectures, both in Face to Face, and electronically, with practical and programming exercises. Direct interaction with learners to identify the level of knowledge

	acquisition and identify strengths and weaknesses from the learner's feedback.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Familiarize yourself with the course's study plan With a general introduction to database systems	Course Plan and References, Introduction to Database Approach	Lecture and lab	Exams
2	4	Characteristics and advantages of the database style with recognizing the benefits of database management software systems	Characteristics of the Database Approach, and Advantages of Using the DBMS	Lecture and lab	Exams
3,4	8	Database Languages and Interfaces, the Database System Environment, Centralized and Client/Server Architectures for DBMS, and Classification of Database Management Systems	Concepts and architecture of database systems Data Models and General Description Diagram of a Database System The three levels of the system general description architecture with data independence	Lecture and lab	Exams
5,6	8	Database languages and interfaces, DBMS environment, systems-centric architecture and user/server style of DBMS, with DBMS classes	Database Languages and Interfaces, the Database System Environment, Centralized and Client/Server Architectures for DBMS, and Classification of Database Management Systems	Lectures and Labs	Exams
7		Monthly Exams	Semester- One Mid Term Examination-One	Lectures and Labs	Exams
8,9	8	The concept of the relational model, constraints and limitations of the data model and the descriptive schema of the relational system	Relational Model Concepts, Relational Model Constraints and Relational Database Schemas.	Lectures and Labs	Exams
10,11	8	Define data with data types in structural retrieval	SQL Data Definition and Data Types	Lectures and Labs	Exams
12,13	8	sql basic query	Basic Retrieval Queries in SQL	Lectures and Labs	Exams
14	4	Phrases and Verbs Update data in language sql	Basic Update SQL statements	Lectures and Labs	Exams
15	4	Monthly exam	Semester - One Mid Term Examination	Lectures and Labs	Exams
16,17	8	Algebraic relations and relational relations	The Relational Algebra and Relational Calculus	Lectures and Labs	Exams
18-21	16	Draw data models using shapes and symbols to produce a diagram of entities and relationships E-R	Data Modeling Using the Entity-Relationship	Lectures and Labs	Exams
22,23	8	Database systems design theory and relationship normalization method The basics of reliability between variables And its impact on the process of normalizing relations	Database Design Theory and Normalization Basics of Functional Dependencies and Normalization for Relational Databases	Lectures and Labs	Exams

24	4	Monthly exam for the second semester	Semester-Two Mid Term Examination – one	Lectures and Labs	Exams
25,26	8	The natural form and its dependence on the primary key of the relationship	Normal Forms Based on Primary Keys	Lectures and Labs	Exams
27,28	8	General definition of the second level of normalization Relations	General Definitions of Second Forms	Lectures and Labs	Exams
29		General definition of the third level of normalization relations	General Definitions of Third Normal Forms	Lectures and Labs	Exams
30	4	Second monthly exam	Semester- Two Mid Term Examination- Two to SQL	Lectures and Labs	Exams
31	4	Practical and theoretical final exam	Practical, Written Final Examination	Lectures and Labs	Exams

11. Course Evaluation

Test students to see how much they interact with the lecture, and conduct weekly written and oral tests

Students are tested orally and practically periodically to determine the extent of their comprehension of the scientific theories put forward.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. FUNDAMENTALS OF Database Systems, SIXTH EDITION, 2010 2. Ramez Elmasri, Department of Computer Science and Engineering, The University of Texas at Arlington, and Shamkant B. Navathe, College of Computing, Georgia Institute of Technology 3. DATABASE SYSTEM CONCEPTS, SIXTH EDITION, 2011 4. Abraham Silberschatz, Yale University, Henry F. Korth, Lehigh University, and S. Sudarshan, Indian Institute of Technology, Bombay
Recommended books and references (scientific journals, reports…)	A number of electronic references and a number of specialized websites.
Electronic References, Websites	

Course Description Form

13. Course Name:
Digital Communications
14. Course Code:
3CTEC3
15. Semester / Year:
Yearly
16. Description Preparation Date:
30/5/2021
17. Available Attendance Forms:
Mandatory
18. Number of Credit Hours (Total) / Number of Units (Total)
120h
19. Course administrator's name (mention all, if more than one name)
Name: Assist. Lect. Zaid Saad Alsabea Email: zaid.alsabea@alkafeel.edu.iq

20. Course Objectives	
Objectives of the study subject	Preparing the student to learn about digital communication techniques and the types of digital inclusion of all kinds of inter and high frequencies.

21. Teaching and Learning Strategies	
Strategy	Theoretical and practical lectures and presentation of information from various reputable scientific source.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	4	Learn about the digital communication system, its advantages and disadvantages	Introduction to Digital Communications - Advantages and Disadvantages of Digital Communications System - Elements of Digital Communications System	Lecture and lab	exams and quizzes
2nd	4	Learn about sampling theory	Sampling Theorem	Lecture and lab	exams and quizzes
3rd, 4th, 5th	12	Learn about pulse modulation techniques	Pulse Amplitude Modulation (PAM) Pulse Duration (or Width) Modulation (PDM or PWM) Pulse Position Modulation (PPM)	Lecture and lab	exams and quizzes

6th, 7th	8	Familiarity with information fusion technology (pulse)	Time Division Multiplexing (TDM)	Lecture and lab	exams and quizzes
8th, 9th, 10th	12	Learn about Pulse Coded Modulation	Pulse Code Modulation (PCM)	Lecture and lab	exams and quizzes
11th	4	Familiarity with information fusion technology (pulse coded)	Digital Multiplexers	Lecture and lab	exams and quizzes
12th	4	Learn about advanced pulse-coded modulation techniques	Differential PCM (DPCM) & Adaptive DPCM (ADPCM)	Lecture and lab	exams and quizzes
13th, 14th	8	Learn about enhanced digital embedding techniques	Delta Modulation (DM) Adaptive DM (ADM)	Lecture and lab	exams and quizzes
15th - 20th	24	Learn basic digital embedding techniques	Amplitude Shift Keying (ASK) Frequency Shift Keying (FSK) Phase Shift Keying (PSK)	Lecture and lab	exams and quizzes
21st - 27th	28	Learn about advanced digital embedding techniques	Differential PSK (DPSK) Quadrature PSK (QPSK) Offset QPSK (OQPSK) Minimum Shift Keying (MSK) M-ary FSK M-ary PSK Quadrature Amplitude Modulation (QAM) or (QASK)	Lecture and lab	exams and quizzes
28th, 29th, 30th	12	Identify problems that may occur in communication	Inter-Symbol Interference (ISI) Equalizer & Adaptive Equalizer Matched Filter	Lecture and lab	exams and quizzes

23. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

Students are tested orally and practically periodically to determine the extent of their comprehension of the scientific theories put forward

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Digital Communications Fundamentals and Applications, by Bernard Sklar, Prentice Hall, USA. 2. Communication Systems, by Simon Hyakin, Wiley, USA. 3. Modern Digital and Analog Communications Systems, by B. P. Lathi, Oxford University, England. 4. Digital Communications, by Ian A. Glover and Peter M. Grant, Prentice Hall, England. 5. Digital Communication, by Andy Bateman, Prentice Hall, USA. 6. Communication Systems an Introduction to Signals and Noise in

	Electrical Communication, by A. Bruce Carlson, et at, McGraw-Hill, USA.
Recommended books and references (scientific journals, reports…)	A number of electronic references and number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:
Digital signal processing
2. Course Code:
3CTEE6
3. Semester / Year:
Annual
4. Description Preparation Date:
30/5/2021
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
120h
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Zainab Sabah Idan Email: zainabsabah@alkafeel.edu.iq

8. Course Objectives	
Objectives of the study subject	Students teach the basic themes of the signal processor and its uses in the audio signal processing, image and use of digital filters.

9. Teaching and Learning Strategies	
Strategy	Learn the basics of digital signal processing according to the theory of the lecture, and to follow modern methods of learning such as the use of electronic screens and presentations. Theoretical and practical lectures and presentation of information from a variety of prestigious scientific sources.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st,2nd ,3th	12	Identify the components of a digital signal processor and distinguish them from an analogue signal processor	Introduction to digital signal processing : Basic elements of DSP, DSP vs. ASP, application of DSP, Continues time signals vs. discrete time signals	Lecture and laboratory	the exams
4th، 5th,6th	12	Recognizing intermittent signals	Discrete time signals and sequences	Lecture and laboratory	the exams

7th,8th,9th	12	Learn about the types of intermittent signals	Standard of discrete time signals (sequences): Unit sample sequence, Unit step sequence, Unit ramp sequence, Exponential sequence,	Lecture and laboratory	the exams
10th, 11th, 12th	12	Identify the types of intermittent systems and their properties	(classification of discrete time signals)System properties: Static and dynamic system, shift invariant and shift variant system, Causal and non-causal system, linear and nonlinear system, stable and unstable system.	Lecture and laboratory	the exams
13th ,14th	8	Recognizing detour signals and their methods	Convolution : Direct form method, graphical method, slide rule method	Lecture and laboratory	the exams
15th, 16th	8	Identify ways signals are interconnected	Correlation of discrete time sequence: Cross correlation and auto correlation	Lecture and laboratory	the exams
17th, 18th	8	Learn about the frequency domain representation and how to find the frequency response	Frequency domain representation : Find Frequency response	Lecture and laboratory	the exams
19th, 20th, 21st	12	Learn about the discrete Fourier transform, how to use it to convert signals from the time range to the frequency range and vice versa, and how to find the convolution using .it	Discrete Fourier transform (DFT), Linear convolution using DFT, Invers Discrete Fourier transform (IDFT)	Lecture and laboratory	the exams
22nd, 23rd, 24	12	Learn about the fast Fourier transform and the butterfly method	Fast Fourier transform(FFT): Butterfly computation , Invers Fast Fourier transform (IFFT)	Lecture and laboratory	the exams
25th, 26th, 27th	28	Learn about the z-transform, its characteristics and applications	Introduction to Z transform: Definition of Z transform and ROC, Properties of Z transform, Inverse Z transform, application of Z transform(pole& zero plot ,causality and stability of Z transform, solution of difference equation using Z transform	Lecture and laboratory	the exams
28th, 29th, 30th	12	Learn about digital filters and their types	Realization of digital filter: Basic FIR filter structure, direct form of FIR structure, Cascaded form of FIR structure, Basic IIR filter structure, direct form of IIR structure, Cascaded form of IIR structure, Parallel form of IIR structure	Lecture and laboratory	the exams

11. Course Evaluation

Students are tested orally and practically periodically to determine the extent of their comprehension of the scientific theories put forward.

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1. Digital Communications, by Ian A. Glover and Peter M. Grant, Prentice Ha England. 2. Digital Communication, by Andy Bateman, Prentice Hall, USA. 3. Communication Systems an Introduction to Signals and Noise in Electrical Communication, by A. Bruce Carlson, et at, McGraw-Hill, USA.
Recommended books and references (scientific journals, reports…)	A number of electronic references an number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:
Communication Fundamentals
2. Course Code:
2CTE3
3. Semester / Year:
Annual
4. Description Preparation Date:
16-6-2021
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
120h
7. Course administrator's name (mention all, if more than one name)
Name: Assist Lect. Zaid Saad Alsabea Email: zaid.alsabea@jmail.com

8. Course Objectives	
Objectives of the study subject	Teaching the student the basic topics of the basics of communication used in the transmission of data and information transmitted electrically.

9. Teaching and Learning Strategies	
Strategy	1-Giving lectures. 2-Classroom and extracurricular duties. 3-Reading methodological and source books and accessing some websites (self-learning). 4-Discussion in the classroom. Theoretical and practical lectures and presentation of information from various reputable scientific sources.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Identify and classify the types of periodic and non-periodic signals	Introduction to Signals and Systems: Test signals definition,	Lecture and lab	Tests

			signal lassification ("Energy-Power", "Periodic-Non periodic","Random deterministic")		
2	4	Learn about the communication system in general and study its features and components	System Classification (Linear–Nonlinear, Time-varying and Time-invariant, Causal "Realizable" and Non Causal" Non-realizable")	Lecture and lab	Tests
3	4	Learn about communication systems and study the system in detail	System (Frequency) Transfer Function Overview, System Connection and their general Frequency Transfer function	Lecture and lab	Tests
4	4	Familiarization with the technology of the French scientist Fourier series	Signal representation using Fourier Series: Complex (exponential) and Discrete forms, Signal Spectrum (Amplitude and Phase)	Lecture and lab	Tests
5	4	Learn about the energy density technique	Power Spectral Density "PSD"	Lecture and lab	Tests
6	4	Learn about Parceval's theorem for power signals	Parceval's theorem for power signals	Lecture and lab	Tests
7	4	Learn about Fourier Transform, and Inverse Fourier.	Signal Spectrum using Fourier Transform, "Fourier and Inverse Fourier"	Lecture and lab	Tests
8	4	Learn about Energy Spectral Density "ESD"	Energy Spectral Density "ESD"	Lecture and lab	Tests
9	4	Learn about Parceval's theorem for Energy signals	Parceval's theorem for Energy signals	Lecture and lab	Tests
10	4	Learn about Filters Classification and filters types	Filters: Filtering action, Filters Classification based on (response:" ideal & practical" and mode), characteristics of filters response: Butterworth and Chebyshev response, decade & octave principles	Lecture and lab	Tests
11	4	Learn about Typical frequency response curve for LPF, HPF, Passive Filters (RC,RL,RLC).	Typical frequency response curve for LPF, HPF, Passive (lumped elements) Filters (RC,RL,RLC) and their response	Lecture and lab	Tests
12	4	Learn about active filters	Active Filters and Design Procedure, Frequency Transformation with circuits implementation	Lecture and lab	Tests
13	4	Learn about Amplitude Modulation: DSBSC	Amplitude Modulation: DSBSC	Lecture and lab	Tests
14	4	Learn about Amplitude Modulation: DSBLC	Amplitude Modulation: DSBLC	Lecture and lab	Tests
15	4	Learn about Amplitude De-Modulation		Lecture and lab	Tests
16	4	Learn about FDM		Lecture and lab	Tests
17	4	Learn about Signal – to – Noise Ratio in AM		Lecture and lab	Tests
18	4	Learn about FM		Lecture and lab	Tests
19	4	Learn about Commercial FM Transmission		Lecture and lab	Tests
20	4	Learn about Wide Band FM		Lecture and lab	Tests

21	4	Learn about Narrow Band FM		Lecture and lab	Tests
22	4	Learn about PLL		Lecture and lab	Tests
23	4	Learn about Noise in communication systems: Noise in AM systems, Noise in FM Systems, Noise Figure Concept		Lecture and lab	Tests
24	4	Learn about Sky Noise Temperature, Equivalent System Noise Temperature		Lecture and lab	Tests
25	4	Learn about Transmission line		Lecture and lab	Tests
26	4	Learn about Transmission line		Lecture and lab	Tests
27	4	Learn about Transmission line		Lecture and lab	Tests
28	4	Learn about Smith chart		Lecture and lab	Tests
29	4	Learn about Smith chart		Lecture and lab	Tests
30	4	Learn about Smith chart		Lecture and lab	Tests

11. Course Evaluation

Test students to see how much they interact with the lecture, and conduct weekly written and oral tests.

Students are tested orally and practically periodically to determine the extent of their comprehension of the scientific theories put forward.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Theraja series and Schaum series. 2. Principles of electronics communication systems", Louis Frenzel, Fourth edition.
Recommended books and references (scientific journals, reports…)	A number of electronic references an number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:
Computer Applications
2. Course Code:
2CTE6
3. Semester / Year:
Annual
4. Description Preparation Date:
30 / 05 / 2021
5. Available Attendance Forms:
Compulsory
6. Number of Credit Hours (Total) / Number of Units (Total)
120h
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Yahya Mahdi Hadi Email: yahya.almayali@alkafeel.edu.iq

8. Course Objectives	
Objectives of the study subject	Introduce the MATLAB as a programming language to students and explain to them how to find the best solutions. It is rich of many build-in functions that are easy to use and edit, as well as lots of useful tools that can be implemented easily and effectively.

9. Teaching and Learning Strategies	
Strategy	The main learning method is the interaction between lecturer and students during the class. Also, use the most modern methods of teaching such as: smart screens, and present lectures via slides in Microsoft PowerPoints.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introduction about MATLAB and its environment	Introduction, MATLAB Environment, MATLAB Windows (Command Window, Workspace Window,	Lecture and computer laboratory	Test, homework, interacting during the class

			Command History window, Help Window, Editor Window).		
2,3	8	Learn how to write a simple script in MATLAB	First Program, Expressions, Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose, Deleting Rows or Columns.	Lecture and computer laboratory	Test, homework, interacting during the class
5	4	Learn about variables	Variables and assignment statement, logical operator.	Lecture and computer laboratory	Test, homework, interacting during the class
6	4	Arrays, and build-in functions	Arrays, Built-in functions, Basic Matrix Functions (sum, max, min, mean, magic, diag, length, size, median, prod, sort).	Lecture and computer laboratory	Test, homework, interacting during the class
8th, 9th, 10th	12	Graphics, plot data/ diagrams	Basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits).	Lecture and computer laboratory	Test, homework, interacting during the class
7, 8	8	Different program formats, input/ output data	Arguments and return values, M-file, input-output statement.	Lecture and computer laboratory	Test, homework, interacting during the class
9, 10, 11	12	Conditional statements	Conditional Statements (If, Else, Elseif, switch case)	Lecture and computer laboratory	Test, homework, interacting during the class
12, 13, 14	12	Repetition statements	Repetition statements: (While statement, For statement)	Lecture and computer laboratory	Test, homework, interacting during the class
15	4	Text processing	Text processing include: string, digits, characters, etc.	Lecture and computer laboratory	Test, homework, interacting during the class
16	4	Create and edit functions	Procedures and Functions (custom-made MATLAB function, define a function, the input and the output variables, calling functions)	Lecture and computer laboratory	Test, homework, interacting during the class
17	4	Cells and structure	Cells (Pre-defined cells, its usage, cell Arrays, cell two structure).	Lecture and computer laboratory	Test, homework, interacting during the class
18, 19, 20	12	Graphics and objects processing	Handle graphics and user interface: 1. Pre-defined dialogs. 2 .Handle graphics: a) Graphics objects b) Properties of objects. c) Modifying properties of graphics objects.	Lecture and computer laboratory	Test, homework, interacting during the class
21	4	Graphical User Interface (GUI)	GUI Interface (Attaching buttons to actions, Getting Input, Setting Output)	Lecture and computer laboratory	Test, homework, interacting during the class

22, 23,	8	Design GUI	Predefined GUIs and Dialog Boxes.	Lecture and computer laboratory	Test, homework, interacting during the class
24, 25	8	Interactive programs	Menu-driven programs a) Controls: uimenu and uicontrol b) Interactive graphics c) Large program logic flow	Lecture and computer laboratory	Test, homework, interacting during the class
26, 27	8	File processing	Manipulating Text (Writing to a text file, reading from a text file Randomizing and sorting a list, Searching a list.	Lecture and comput r laboratory	Test, homework, interacting during the class
28, 29, 30	12	Image processing	Introduction to Image Analysis (Reading, Writing, Displaying Images)	Lecture and computer laboratory	Test, homework, interacting during the class

11. Course Evaluation

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. The MathWorks Inc., MATLAB R2013, 2013. 2. Zahir M. Hussain, Lectures on Computer Applications with MATLAB, University of Kufa Press, 2017. 3. Stephen J. Chapman, MATLAB Programming for Engineers, 5th Edition, Cengage Learning, Boston, USA, 2016. 4. William J. Palm III, Introduction to MATLAB for Engineers, 3rd Edition, McGraw-Hill, 2010. 5. David Houcque, Introduction MATLAB for Engineering Stude Northwestern University, 2005.
Recommended books and references (scientific journals, reports…)	A number of electronic references an number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Computer Programming (II)	
2. Course Code:	
2CTE5	
3. Semester / Year:	
Yearly	
4. Description Preparation Date:	
30 / 05 / 2021	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Zainab Salam Abdel Shahid Email: zainab.salam@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	The objective of this course is to teach the student to write programs with an emphasis on solving various problems using the principles and principles of structure design by adopting a strategy to simplify problem solving
9. Teaching and Learning Strategies	
Strategy	The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 - 2	8	Understand the basic concepts and tools of Structured Programming using C++	C++ Review (Program structure, namespace, identifiers, variables, constants, enum, operators, typecastings, control structures and functions).	Lecture and lab	The exams
3	4	Understand the basic concepts of object-oriented programming	Introduction to Object-Oriented Programming in C++.	Lecture and lab	The exams
4 - 8	20	The ability to analyze, design and implement software solutions to applied problems according to object-oriented programming concepts	Objects and Classes (Basics of objects an classes in C++, private and public members, static data and function members, constructors and their types, destructors and operator overloading).	Lecture and lab	The exams
9 - 14	24	The concepts of inheritance are applied in the programs that he builds to achieve the largest possible reduction in the code	Inheritance (Concepts of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class).	Lecture and lab	The exams
15 - 19	20	Understand, apply and design software issues that rely on the concept of polymorphism	Polymorphism (Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism).	Lecture and lab	The exams
20 - 24	20	The ability to deal with files in various forms to store and retrieve data	I/O and File management (Concepts of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators, File stream, C++ File stream classes, File management functions, File modes, Binary and random files).	Lecture and lab	The exams
25 - 30	24	Understand the basic concepts and tools of Structured Programming using C++	Templates, Exceptions and STL (What is template?	Lecture and lab	The exams

11. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	[1]-Object-oriented programming using C++ [2]-Object Oriented Programming In C++ (4th Edition) robert lafore
Recommended books and references (scientific journals, reports…)	A number of electronic references an number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:
Electronics
2. Course Code:
2CTE4
3. Semester / Year:
Annually
4. Description Preparation Date:
30 / 05 / 2021
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
120h
7. Course administrator's name (mention all, if more than one name)
Name: Lect. D. Ahmed Ali Talib Email: ahmed.ali@alkafeel.edu.iq

8. Course Objectives	
Objectives of the study subject	Acquire the student the necessary skills to understand and analyze electrical circuits

9. Teaching and Learning Strategies	
Strategy	1. Lecturing 2. Classroom and extracurricular duties 3. Reading methodological and source books and accessing some websites (self-learning). 4. Discussion in the classroom

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.2.3	12	Make the student able to distinguish between materials in terms of their electrical conductivity. And the study of the physical structure of the diode and transistor and the method of forward and reverse coupling	Physic Of semiconductor, Diode and Transistor.	Lecture and lab	the exams
4.5.6	12	Recognize the connection of the electrical circuit and the process of rectifying the incoming waves,	Diode Equivalent Circuits. DC analysis	Lecture and lab	the exams

		and the derivation of special laws for this purpose	, , ac to DC Rectifier FWR) (HWR and		
7,8	8	Make the student able to know the properties of these circuits and their components and the effect of each component on the shape of the external vector	,Clamper cct. Clipper	Lecture and lab	the exams
9,10,11,12	16	Understanding Transistor Circuits How to distinguish between common emitter and base The common and the common collector, what are the differences between them, the point of their operation, and the distinction of the special circuits for each type	BJT Transistor DC Equivalent Circuits, (C.B, C.C and C.E), DC analysis, Load line and Q-Points	Lecture and lab	the exams
13,14	8	Make the student able to analyze the electrical circuit and extract the values of voltage gain, current gain, input resistance and output resistance, and knowledge of the dynamic and statistical resistance	BJT Transistor ac Equivalent Circuits h-parameters and re-model	Lecture and lab	the exams
15,16	8	Make the student able to understand the mechanism of amplification of the input signal of the transistor and what is the effect of connecting the transistor on the amount and shape of the outgoing wave	Transistor Amplifier	Lecture and lab	the exams
20 ,19, 18 , 17	16	Learn about this type of transistors, what they do, and what are their advantages, and analyze the circuits of this type of transistors	FET Transistor DC Equivalent Circuits, (C.G, C.S and C.D), DC analysis, Load line and Q-Points	Lecture and lab	the exams
22 , 21	8	Enable the student to understand the amplification of power and how the electrical circuit is described for this purpose, and to know some laws of amplification of power	Power Amplifiers.	Lecture and lab	the exams
26, 25 ,24 , 23	16	Identify and analyze the properties of these circuits, their mechanism of action, and the effect of their components on the properties of the outgoing wave for each circuit	Operational Amplifiers cct. (Inverter, non-inverter, summing, subsector, integration, and diff.)	Lecture and lab	the exams
28 , 27	8	Learn about the components of the oscillator, what is the purpose of studying it, the mechanism of its currency, and how to use it	Oscillators	Lecture and lab	the exams
30 ,29	8	Understand integrated circuits, what is the purpose of their manufacture, learn about their types, and understand their mechanism	Integrated Circuits	Lecture and lab	the exams

11. Course Evaluation

Test students to see how much they interact with the lecture, and conduct weekly written and oral tests.

Students are tested orally and practically periodically to determine their comprehension of the scientific theories proposed

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Electronic Devices and Circuit theory (for Boylested)

	2. electronic technology (for Theraja) 3. *Electronic Devices* (for Floyd) 4. S. Choudhury Tata McGraw Hill – 2003
Recommended books and references (scientific journals, reports…)	A number of electronic references an number of specialized websites.
Electronic References, Websites	

Course Description Form

13. Course Name:	
Instrumentation and measurements	
14. Course Code:	
2CTE2	
15. Semester / Year:	
Annual	
16. Description Preparation Date:	
30 / 05 / 2021	
17. Available Attendance Forms:	
Mandatory	
18. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
19. Course administrator's name (mention all, if more than one name)	
Name: Lect. Zainab Sabah Idan Email: zainabsabah@alkafeel.edu.iq	
20. Course Objectives	
Objectives of the study subject	Familiarity with international units of measurement, especially those related to electrical engineering. •Analyzing the work of the components of the measurement system and determining the duties of each of them in detail. •Classification of measuring devices and designing some of them. •Proficiency in measurements that can be made on the electric wave
21. Teaching and Learning Strategies	
Strategy	Learn the basics of digital communication according to lecture theory, and follow modern methods of learning such as using electronic screens and presentations.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st , 2nd ,	8	Familiarity with unit systems and measurement standards	Systems of Units and Standards of Measurement	Lecture and lab	the exams
3rd ,4th ,5th	12	Learn about accuracy and precision, types of error, statistical analysis of data	Accuracy and precision, Types of error, Statistical Analysis of Data	Lecture and lab	the exams
6th ,7th, 8th	12	Familiarity with tools for measuring basic electrical parameters (electromechanical Electrical tools: design and static and dynamic characteristics. meter readings, error and compensation)	Instruments for Measuring Basic Electrical Parameters (Electromechanical and electric instruments: design, static and dynamic characteristics. Meter readings, error and compensation).	Lecture and lab	the exams
9th , 10th , 11th	12	Learn about an electronic measuring instrument.	Electronic measuring instrument.	Lecture and lab	the exams
12th ,13th , 14th	12	Identification of bridges (DC and AC bridges: measurement of basic electrical parameters, frequency measurement).	Bridges (DC and AC bridges: basic electrical parameters measurement, frequency measurement).	Lecture and lab	the exams
15th ,16th , 17th	12	Familiarity with oscilloscopes (CRT deflection, sensors and functions, measurement techniques, Species)	Oscilloscopes (CRT deflection, probes and functions, measuring techniques, types)	Lecture and lab	the exams
18th , 19th , 20th	12	Recognize transducers (mode, pressure, velocity, acceleration, force, torque, Temperature, photosensitive transducers, cage strain, differential adapter)	Transducers (Position, pressure, velocity, acceleration, force, torque, temperature, Photosensitive transducers, strain cage, differential transformer)	Lecture and lab	the exams
21st, 22nd	8	Signal generation recognition (introduction, sine wave generator, frequency Composite Signal Generator, Frequency Divider Generator)	Signal Generation (Introduction, The sine wave generator, frequency synthesized signal generator, frequency divider generator)	Lecture and lab	the exams
23rd, 24th	8	Learn about the concept of a digital tool.	Digital instrument.	Lecture and lab	the exams
25th ,26th , 27th	12	Understand the concept of tools for generation	Instruments for generation	Lecture and lab	the exams

28th , 29th , 30th	12	Learn to analyze waveform oscillators.	Analysis of wave form oscillators.	Lecture and lab	the exams

23. Course Evaluation

Test students to see how much they interact with the lecture, and conduct weekly written and oral tests.

Students are tested orally and practically periodically to determine their comprehension of the scientific theories proposed.

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Y. Bakouros and V. Kelessidis INNOREGIO: dissemination of 2. innovation and knowledge techniques, January 2000. 3. J.R. Meredith and S.J. Mantel J. Wiley & Sons, 1995 4. Principles of , NPC publication 5. S. Choudhury Tata McGraw Hill – 2003
Recommended books and references (scientific journals, reports…)	A number of electronic references and number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Mathematics (II)	
2. Course Code:	
2CTE7	
3. Semester / Year:	
Yearly	
4. Description Preparation Date:	
30 / 05 / 2021	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Reham Moin Hattash Email: reham.moen@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	The course aims to introduce students to mathematics through the necessary mathematical laws and problems for the purpose of helping them in their studies in their field of specialization.
9. Teaching and Learning Strategies	
Strategy	The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 & 2	6		Complex numbers, polar form of complex numbers, linear algebra for complex number in polar and Cartesian coordinates	Lecture	the exams
3 & 4	6		Complex function, complex variables	Lecture	the exams
5 & 6	6		Cauchy- Reimann equations, Harmonics	Lecture	the exams
7 & 8	6		Double integral	Lecture	the exams
9 & 10	6		Multiple integration, surface area	Lecture	the exams
11	3		Green's theorem	Lecture	the exams
12	3		Stock's theorem	Lecture	the exams
13 & 14	6		Theory of vector field, vector variable	Lecture	the exams
15 & 16	6		Function, separation and convolution	Lecture	the exams
17, 18, 19 , 20	12		Infinite series, power series con. And din series of number, Tayler series and McLaurin series	Lecture	the exams
21 & 22	6		Matrices, inverse of matrix, solution of Hogging equations by matrices, Eigen values, Eigen vectors	Lecture	the exams
23, 24, 25, 26, 27 & 28	18		Differential equations, D.E. of first order and of order N, and applications	Lecture	the exams
29 & 30	6		Review	Lecture	the exams

11. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Thomas Calculus Based on The Original Work by George B. Thomas, Jr., 14th Ed. 2018. 2. Advanced Engineering Mathematics by C. Ray Wylie

	3. Math Refresher for Scientists and Engineers by John R. Fanchi, 3rd Ed., 2006. 4. Advanced Engineering Mathematics by Erwin Kreyszig, 10th Ed., 2011. 5. Advanced Engineering by Alan Jeffrey, University of Newcastle-Upon-Tyne, 2002. 6. Advanced Mathematics for Engineers and Scientists, SI (Metric) Edition, by Murray R. Spiegel, Asian Student Edition, 1983.
Recommended books and references (scientific journals, reports…)	A number of electronic references and a number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Engineering Analysis	
2. Course Code:	
3CTEC4	
3. Semester / Year:	
Yearly	
4. Description Preparation Date:	
30 / 05 / 2021	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Reham Moin Hattash Email: reham.moen@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	The course aims to help the student understand the mathematical rules and equations necessary for the purpose of solving electrical circuits
9. Teaching and Learning Strategies	
Strategy	The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st,2nd,3rd,4th,5th,6th,7th	28	Identify the characteristics of the Laplace transformer and study its theories and applications	Complex numbers, polar form of complex numbers, linear algebra for complex number in polar and Cartesian coordinates	Lecture and lab	The exams
8th,9th,10th,11th,12th,13th, 14th	28	Identify the characteristics of the Z transformer and study its theories and applications	Complex function, complex variables	Lecture and lab	The exams
15th,16th,17th,18th,19th	20	Probability recognition (key terms, probability and set notation, law of probability, independent events)	Cauchy- Reimann equations, Harmonics	Lecture and lab	The exams
20th,21th,22th,23th	16	Familiarity with numerical computations (halving method, false position method, Newton-Raphson method, solving algebraic and transcendental equations, solving linear simultaneous equations 1) direct methods a) Gaussian elimination b) Gauss Jordan 2) iterative method	Double integral	Lecture and lab	The exams
24 th,25th	8	Learn about solving a nonlinear equation (Newton-Raphson method)	Multiple integration, surface area	Lecture and lab	The exams
26th,27th,28th	12		Green's theorem	Lecture and lab	The exams
29th,30th	8	Recognize the numerical solution of an ordinary differential equation (Pickard's method, Euler's method))	Stock's theorem	Lecture and lab	The exams
1st,2nd,3rd,4th,5th,6th,7th	28	Identify the characteristics of the Laplace transformer and study its theories and applications	Theory of vector field, vector variable	Lecture and lab	The exams
8th,9th,10th,11th,12th,13th, 14th	28	Identify the characteristics of the Z transformer and study its theories and applications	Function, separation and convolution	Lecture and lab	The exams
15th,16th,17th,18th,19th	20	Probability recognition (key terms, probability and set notation, law of probability, independent events)	Infinite series, power series con. And din series of number, Tayler series and McLaurin series	Lecture and lab	The exams
20th,21th,22th,23th	16	Familiarity with numerical computations (halving method, false position method, Newton-Raphson method, solving algebraic and transcendental equations, solving linear simultaneous equations 1) direct methods a) Gaussian elimination b) Gauss Jordan 2) iterative method	Matrices, inverse of matrix, solution of Hogging equations by matrices, Eigen values, Eigen vectors	Lecture and lab	The exams
24 th,25th	8	Learn about solving a nonlinear equation (Newton-Raphson method)	Differential equations, D.E. of first order and of order N, and applications	Lecture and lab	The exams
th,27th,28th	12			Lecture and lab	The exams
29th,30th	8	Recognize the numerical solution of an ordinary differential equation (Pickard's method, Euler's method))	Review	Lecture and lab	The exams

11. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1. Advanced Engineering Mathematics (K. A. Stroud). 2. Advanced Engineering Mathematics (Alan Jeffrey). 3. Advanced Engineering Mathematics (Erwin Kreyszig). 4. Advanced Engineering Mathematics (Dean G. Duffy). 5. Introductory Methods of Numerical Analysis (S.S. Sastry) Math Refresher for Scientists and Engineers by John R. Fanchi, 3rd Ed., 2006.
Recommended books and references (scientific journals, reports…)	A number of electronic references and number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Real Time Systems Design	
2. Course Code:	
3CTEC5	
3. Semester / Year:	
Year	
4. Description Preparation Date:	
30 / 05 / 2021	
5. Available Attendance Forms:	
Mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Lect. Ahmed Abdel Razzaq Yassin Email: ahmed.fatlawi@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	Giving the student about the basic concepts of real-time systems and their most important components and how to build them
9. Teaching and Learning Strategies	
Strategy	The main learning strategy is the interactive method between The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 -2- 3	28	Learn the basic concepts of real-time systems, how they work, and their real-world applications.	Definitions of RTS.	Lecture and lab	exams and quizzes
4 -5	28	Distinguish between the different properties of real time systems.	Signals, Systems, Specification	Lecture and lab	exams and quizzes
6-7-8	20	The ability to construct and analyze an analog real time circuit using an operational amplifier.	Analog computer components, Systems	Lecture and lab	exams and quizzes
9 -10 -11	16	Recognize signal converters from analogue to digital and back	ADC, DAC: [Definition, Types, Specifications, Errors, C/Cs and Interfacing choosing].	Lecture and lab	exams and quizzes
12	8	Learn the basics of the digital system.	Introduction to Digital systems.	Lecture and lab	exams and quizzes
13 -14	12	Recognize the programmable and non-programmable interface.	Basic interfacing devices.	Lecture and lab	exams and quizzes
15	8	Learn how to control the transfer of data to and from the computer.	Data Transfer controlling	Lecture and lab	exams and quizzes
16	28	Understand the programmable and non-programmable interface.	Un programmable interfacing devices	Lecture and lab	exams and quizzes
17- 19- 20-21	28		Programmable interfacing devices [8-bit compatible, General purpose, Timers, Peripheral controller].	Lecture and lab	exams and quizzes
22-23-24	20	Understand the concept of cutting and how to deal with cutting software and the digital controller for cutting 8259	Interrupts [Introduction, Types (hardware & software), Controller 8259A,[Handshaking and interrupts methods	Lecture and lab	exams and quizzes
25-26-27-28-29-30	16	Design and implementation of real time systems based on microcontrollers and sensors.	Design and Implementation of real time systems based on microcontrollers and sensors.	Lecture and lab	exams and quizzes

11. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Real-Time Systems , Janos Sztipanovits & E. Bronson

	2. Introduction to Real-Time Systems , Peter Puschner 3. arduino guide App .
Recommended books and references (scientific journals, reports…)	Many of electronic references and a so of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Advanced Computer Technology	
2. Course Code:	
4CTEE7	
3. Semester / Year:	
Year	
4. Description Preparation Date:	
30 / 05 / 2021	
5. Available Attendance Forms:	
Mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Lect. Ahmed Abdel Razzaq Yassin Email: ahmed.fatlawi@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	• Study of the advanced internal architecture of the 80386 microprocessor. • Studying addressing methods. • Studying the types and methods of storage in the main, temporary and virtual memories. • Studying the working method of the processor, which operates in the system of fragmentation and teleportation. • An architectural study and features of some designs of recent generations of microprocessors with multiple hearts. • An architectural study and features of some designs of recent generations of microprocessors with the ability to parallel processing. • Studying the modern types of in systems with the sudden interrupt

	systems and the direct presence memory by the input units.

9. Teaching and Learning Strategies

Strategy	The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens. Given theoretical and practical lectures based on different and robust resources.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4		Introduction to computers - Internal organization of computers	Lecture and lab	exams and quizzes
2	4		Introduction to assembly programming	Lecture and lab	exams and quizzes
3	4		More about segment in the 80x86	Lecture and lab	exams and quizzes
4 , 5	8		The µP and its architecture . Addressing modes	Lecture and lab	exams and quizzes
6 , 7	8		Protected mode memory addressing . Selectors and descriptors . Local and global descriptor tables	Lecture and lab	exams and quizzes
8 , 9	8		Descriptor and page table entries - Program – invisible registers - Illustrating local memory access Examples	Lecture and lab	exams and quizzes

10 , 11	8		Memory paging - Virtual memory	Lecture and lab	exams and quizzes
12 , 13	8		Paging mechanism . Segment translation . Page translation	Lecture and lab	exams and quizzes
14	4		TLB Examples	Lecture and lab	exams and quizzes
15	4		Major changes in the 80386	Lecture and lab	exams and quizzes
16	4		Hardware organization of the memory address space	Lecture and lab	exams and quizzes
17	4		Bus states and pipelined and non pipelined bus cycles.	Lecture and lab	exams and quizzes
18 , 19	8		Cache memory - Cache organization . Fully associative . Direct mapped . Set associative	Lecture and lab	exams and quizzes
20 , 21	8		Examples	Lecture and lab	exams and quizzes
22 , 23	8		Cache memory used for 80386 - Direct Maps - Two-way set associative	Lecture and lab	exams and quizzes
24	4		Enhancements of 80386	Lecture and lab	exams and quizzes
25	4		Pipelining design Techniques	Lecture and lab	exams and quizzes
26 , 27	8		Intel's Pentium . Features of the Pentium . Intel's overdrive technology	Lecture and lab	exams and quizzes
28	4		Pentium pro . Out of order execution	Lecture and lab	exams and quizzes
29 , 30	8		Other Pentium processors - Core Processor		

11. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.
Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Advanced Computer Architecture and Parallel Processing :by Hesham El-Rewini & Mostafa Abd-El-Barr \ Copyright © 2005 by John Wiley & Sons. 2. Principles of computer architecture :by Miles J. Murdocca \ CLASS TEST EDITION – AUGUST 1999 \ Copyright©1999 Prentice Hall

	3. Intel 80386 hardware reference manual \ @INTEl CORPORATION 1986.
Recommended books and references (scientific journals, reports…)	Many of electronic references and a some specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:
Computer Networks Protocols
2. Course Code:
4CTEC4
3. Semester / Year:
Annual
4. Description Preparation Date:
16-6-2021
5. Available Attendance Forms:
Mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
120h
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Lect. Zainab Salam Abdel Shahid Email: zainab.salam@alkafeel.edu.iq

8. Course Objectives	
Objectives of the study subject	Teaching the student the basic topics of the basics of protocols used in the transmission of data and information transmitted electrically.

9. Teaching and Learning Strategies	
Strategy	1- Giving lectures. 2- Classroom and extracurricular duties. 3- Reading methodological and source books and accessing some websites (self-learning). 4- Discussion in the classroom. Theoretical and practical lectures and presentation of information from various reputable scientific sources.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	4	Learn about Introduction to the OSI Reference Mode	Introduction to the OSI Reference Mode	Lecture and lab	Tests
2	4	Learn about the TCP/IP Reference Model	TCP/IP Reference Model	Lecture and lab	Tests
3	4	Learn about Application Layer Protocols	Application Layer Protocols	Lecture and lab	Tests
4	4	Familiarization with the technology of WWW	WWW	Lecture and lab	Tests
5	4	Learn about the (HTTP, HTTPs, FTP)	(HTTP, HTTPs, FTP)	Lecture and lab	Tests
6	4	Electronic Mail (SMTP, POP)	Electronic Mail (SMTP, POP)	Lecture and lab	Tests
7	4	Learn about DHCP, DNS, SNMP	DHCP, DNS, SNMP	Lecture and lab	Tests
8	4	Learn about SSH, Telnet, BGP, RIP	SSH, Telnet, BGP, RIP	Lecture and lab	Tests
9	4	Learn about Transport Layer Protocols	Transport Layer Protocols	Lecture and lab	Tests
10	4	Learn about Congestion Control , Flow Control	Congestion Control , Flow Control	Lecture and lab	Tests
11	4	Learn about End to End Protocols (UDP)	End to End Protocols (UDP)	Lecture and lab	Tests
12	4	Learn about TCP, RPC	TCP, RPC	Lecture and lab	Tests
13	4	Learn about Network Layer Protocols Routing Algorithms	Network Layer Protocols Routing Algorithms	Lecture and lab	Tests
14	4	Learn about Flooding, Shortest path routing	Flooding, Shortest path routing	Lecture and lab	Tests
15	4	Learn about Distance Vector routing	Distance Vector routing	Lecture and lab	Tests
16	4	Learn about Link Sate routing	Link Sate routing	Lecture and lab	Tests
17	4	Learn about Hierarchical routing	Hierarchical routing	Lecture and lab	Tests
18	4	Learn about Broadcast and multicast routings	Broadcast and multicast routings	Lecture and lab	Tests
19	4	Learn about Routing in the Internet	Routing in the Internet	Lecture and lab	Tests
20	4	Learn about Path Vector routing	Path Vector routing	Lecture and lab	Tests
21	4	Learn about OSPF routing	OSPF routing	Lecture and lab	Tests
22	4	Learn about EIGRP routing	EIGRP routing	Lecture and lab	Tests
23	4	Learn about IPv4 , IPv6, IPsec	IPv4 , IPv6, IPsec	Lecture and lab	Tests
24	4	Learn about ICMP , IGMP	ICMP , IGMP	Lecture and lab	Tests
25	4	Learn about control and flow control algorithms	Data Link Layers , Error control and flow control algorithms	Lecture and lab	Tests
26	4	Learn about ARP, L2TP, PPP	ARP, L2TP, PPP	Lecture and lab	Tests
27	4	Learn about MAC (Ethernet, DSL, ISDN, FDDI).	MAC (Ethernet, DSL, ISDN, FDDI).	Lecture and lab	Tests
28	4	Learn about STP	STP	Lecture and lab	Tests
29	4	Learn about CSMA/CD	CSMA/CD	Lecture and lab	Tests
30	4	Learn about Check Sum algorithms	Check Sum algorithms	Lecture and lab	Tests

11. Course Evaluation

Test students to see how much they interact with the lecture, and conduct weekly written and oral tests.

Students are tested orally and practically periodically to determine the extent of their comprehension of the scientific theories put forward.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	

Main references (sources)	[1] Digital Communications Fundamentals and Applications, by Bernard Sklar, Prentice Hall, USA. [2] Communication Systems, by Simon Hyakin, Wiley, USA. [3] Modern Digital and Analog Communications Systems, by B. P. Lathi, Oxford University, England. [4] Digital Communications, by Ian A. Glover and Peter M. Grant, Prentice Hall, England. [5] Digital Communication, by Andy Bateman, Prentice Hall, USA. [6] Communication Systems an Introduction to Signals and Noise in Electrical Communication, by A. Bruce Carlson, et at, McGraw-Hill, USA
Recommended books and references (scientific journals, reports…)	A number of electronic references and a number of specialized websites.
Electronic References, Websites	

Course Description Form

13. Course Name:	
Information theory and Coding	
14. Course Code:	
CTEE6	
15. Semester / Year:	
Annually	
16. Description Preparation Date:	
30/5/2021	
17. Available Attendance Forms:	
Fulltime	
18. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
19. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ali Abdel Zahra Jalil Email: ali.abdulzahraa@alkafeel.edu.iq	
20. Course Objectives	
Objectives of the study subject	• Management of the basic components of the information system used in computer networks, according to Shannon's theory. • Evaluate what the sources possess of information or redundant information and determine their efficiency by mathematical methods. • Distinguish the difference between continuous and discontinuous information channels, and master the method of calculating their capacities. • Gain detailed and applied knowledge about the basic types of source coding, and the method for calculating their efficiency. • Gain detailed knowledge of the basic types of channel coding and ways to detect and correct errors in it. • Gaining basic knowledge to avoid the main sources of channel errors, and to reduce their impact as much as possible..

21. Teaching and Learning Strategies

Strategy	1- Explanation and clarification (lecture). 2- Presentation of selected models of explanatory questions and their solutions. 3- Self-learning method (assigning students to complete learning some skills after giving them the basics). To reach C1-C2 of Paragraph 9, the student is assigned to address a practical engineering problem related to control engineering, and during his study period, he presents appropriate solutions to analyze the origin of the problem, follow the theories and rules used to solve it, and present the results of the analysis and solutions and its economic and social impact. A1- He understands the requirements of the engineering profession and ethical responsibility in addition to the need for lifelong learning and the ability to engage in it. B2- Understand the impact of engineering solutions on economic activities.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	The student should be able to understand control systems and methods of representing and analyzing them.	Review of related probability and statistics related topics. definition of Alphabet , Definition of random variable.	A theoretical presentation using illustrative diagrams and some general engineering principles	achievement test + class assignment
2	4		Definition of joint probability , Conditional probabilities and Bayes rule Independence of two	A theoretical presentation using the laws and rules of probability	achievement test + class assignment

			random variables .Venn's diagram.		
3	4		Model of information transmission system. Common sense definition of information .Logarithmic measure of information. Self-information.	Understanding sense of information	achievement test + class assignment
4	4		Definition of information for noisy channel .Posteriori probabilities Average mutual information for noisy channel.	A theoretical presentation using the laws and rules of channels	achievement test + class assignment
5	4	Learning how to describe information channel	Shannon representation diagram of information source. Parameters of discrete channel.	The student should be able to understand the impact of the work of the controllers on the control systems.	achievement test + class assignment
6	4	Having ability to compute entropy for info. Source	Average information (entropy) of a discrete and continuous source, maximum source entropy. Source efficiency.	A theoretical presentation using the laws and rules of control engineering.	achievement test + class assignment
7	4	Ability to describe information channel by transition matrix	Transition probability matrix of channel, discrete noiseless and noisy channel models, uniform channel. Ternary symmetric channel.		achievement test + class assignment
8	4	Understanding BSC and TSC	Information transmission over symmetric channel, noiseless channel, binary symmetric channel, ternary symmetric channel.	The student should be able to analyze the balance of control systems and the ability to analyze the performance of the system in the time and frequency range. And that the student is able to design the control system.	achievement test + class assignment
9	4	Understanding special cases in Binary channels	Memory and memory less information channels .Binary Erasure channel (BEC).	Lecture and lab	achievement test + class assignment
10-11	8	Having ability to calculate capacity ,efficiency for Symmetric channel	Capacity of discrete channel, channel capacity for noiseless channel. Channel efficiency and redundancy. Channel capacity for symmetric channels.	Lecture and lab	achievement test + class assignment
12	4	Theoretical presentation	Channel capacity for nonsymmetrical channels .binary	Lecture and lab	achievement test + class assignment

			nonsymmetrical channel.		
13	4	Understanding continuous information channel with Gaussian noise distribution .	Mutual information of continuous channel. Capacity of continuous channels. Efficiency and redundancy of continuous channel.	Lecture and lab	
14	4	Learning relation between Shannon-Hartly formula and Nyquist theorem .	Entropy for continuous uniform distribution source. Entropy for continuous Gaussian distribution source.	Lecture and lab	
15-16	8	Learning how to compute capacity for continuous channel	Sampling of continuous source .Sampling Theorem. Nyquist theorem for transmission over band limited continuous channel. Shannon-Hartly channel capacity theorem.4	Lecture and lab	
17	4	Learning how to deal with channels when cascaded	AWGN channel model (capacity ,bandwidth ,S/N ratio) .	Lecture and lab	
18	4	Understanding basics of source coding types	Cascaded information channels .Parallel information channels.	Lecture and lab	
19	4	Understand and apply	Source encoding; fixed and variable length codes. Prefix property .Average length of source code. Source code efficiency and redundancy.	Lecture and lab	
20	4	Understand and apply	tree coding method.	Lecture and lab	
21-24	16	Understand and apply	Shannon – Fano coding method.	Lecture and lab	
27-30	16	Understand why we need channel coding ,and basic types	Huffman Coding. Hamming distance.	Lecture and lab	

3. Course Evaluation

1- Theoretical presentation of the curriculum vocabulary through the use of some general engineering principles, which lead to the analysis and design of the engineering problem, in addition to using the laws and rules of control engineering. (Get A1-A5 from Paragraph 9)
2- Class group discussions of practical examples of control systems. (Get A1 from Paragraph 9)
3- Laboratory application of the curriculum vocabulary using computer programs to represent and analyze systems, such as the Matlab program (obtaining B1-B4 from paragraph 9)

Students are tested orally and practically periodically to determine the extent of their comprehension of the scientific theories proposed.

The results are presented in class to be discussed and the rest of the students participate in the discussion.

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Data Communications and Networking \McGraw-Hill \Forouzan Networking Series \by Behrouz A. Forouzan\Copyright © 2007 by The McGraw-Hill Companies, Inc. ELEMENTS OF INFORMATION THEORY\Second Edition \THOMAS M. COVER & JOY A. THOMAS \ Second Edition\Copyright© 2006 by John Wiley & Sons
Recommended books and references (scientific journals, reports…)	A number of electronic references an number of specialized websites. A numl of electronic references and a number specialized websites. Google books
Electronic References, Websites	

Course Description Form

1. Course Name:	
Mobile communication	
2. Course Code:	
3CTEE6	
3. Semester / Year:	
annual	
4. Description Preparation Date:	
30/5/2021	
5. Available Attendance Forms:	
Mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Lect. D. Ahmed Ali Talib Email: ahmed.ali@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	Article aims to study the cellular mobile communication systems of all generations, the student and the study of the internal structure of cells and coverage of the communication process.
9. Teaching and Learning Strategies	
Strategy	1. Theoretical lectures in the classroom and practical in the laboratory 2. Involve the student in designing the micro communication towers and writing the software part 3. Laboratory application using computer programs and discussion of the results In order to reach C1-C2 of Paragraph 10, the student is assigned to address a practical engineering problem related to the Controllers, and during his study period, he presents appropriate solutions to analyze the origin of the problem, follow the theories and rules used to solve it,

	present the results of the analysis and solutions, and their economic and social impact

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	4	The student should be able to understand control systems and methods of representing and analyzing them.	Introduction to Wireless Communication System: Evolution of mobile communications, Mobile Radio System around the world, Types of Wireless communication System, Comparison of Common wireless system, Trend in Cellular radio and personal communication, Second generation (2G) systems. Evolved Second-Generation Systems (2.5G). Third-Generation (3G) Systems. Fourth-Generation (4G) Systems. Fifth-Generation (5G) Systems	Presentation of slides and illustrations of the types and generations of mobile communication systems and their uses	daily test
7-4	4		The Cellular Concept-System Design Fundamentals: Cellular system, Hexagonal geometry cell and concept of frequency reuse, Channel Assignment Strategies Distance to frequency reuse ratio, Cha|nnel & cochannel interference reduction factor, S/I ratio consideration and calculation for Minimum Co-channel and adjacent interference, Handoff Strategies, Umbrella Cell Concept	Clarify the mechanism for extracting the frequencies of the base stations for the users and how to use these frequencies and ways to redistribute them on the network	daily test
8-11	4		Traffic Engineering: Trunking and Grade of Service, Improving Coverage	Clarify the mechanism and volume of information transmitted between devices and	nthly exam

			& Capacity in Cellular System-cell splitting, Cell sectorization	base stations, and calculate mathematical laws to obtain the required results	
12-15	4		Large scale path loss: Free Space Propagation loss equation, Path-loss of NLOS and LOS systems, Reflection, Ray ground reflection model, Diffraction, Scattering, Link budget design,	Explain, clarify and perform the calculations required for the work of microwave stations, taking into account the standards, signal strength and the possibility of changing temperatures and rain	daily test
16-18	4	Learning how to describe information channel	Small scale multipath propagation: Impulse model for multipath channel, Delay spread, Feher's delay spread, upper bound Small scale, Multipath Measurement parameters of multipath channels, Types of small scale Fading, Rayleigh and Rician distribution	Calculating the microwave signal propagation by designing a station using the Pathloss4.0 program	nthly exam
19-22	4	Having ability to compute entropy for info. Source	Modulation Techniques for Mobile Radio: Review for basic digital modulation techniques, QPSK,MSK,GMSK Multiple Access Techniques: Frequency Division Multiple Access (FDMA). Time Division Multiple Access (TDMA). Spread Spectrum Multiple Access. Space Division Multiple Access (SDMA)	Learn about the types of signal modulating and learn about the methods of using transmission through FDMA, TDMA or CDMA and the benefits of each method and how to use it	test
23-28	4	Ability to describe information channel by transition matrix	Wireless Systems: GSM system architecture, Radio interface, Protocols, Localization and calling, Handover, Authentication and security in GSM, GSM speech coding, Concept of spread spectrum, Architecture of IS-95 CDMA system, Air interface, CDMA	Explain and clarify the types of protocols used in mobile communication systems and clarify the difference between GSM, and CDMA and the architecture of each type	test

			forward channels, CDMA reverse channels, Power control in CDMA, cellular technology, GPRS system architecture		
29-30	4	Understanding BSC and TSC	Recent trends: Wi-Fi, WiMAX, ZigBee Networks, Software Defined Radio, UWB Radio, Wireless Ad-hoc Network and Mobile Portability, Security issues and challenges in a Wireless network.	Addressing other types of systems and the benefits and problems of each type and its mechanism of action	test

11. Course Evaluation

1. Test grades and classroom and home assignments to learn the knowledge base of the student to check A2-A4 of paragraph 10
2. Test the discussion to verify the A of paragraph 10
3. 3-testing laboratory to verify the B1 to B3 of paragraph 10

the results are presented in class to be discussed and the rest of the learners participate in the discussion.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1-Wireless communications principles and practice 2-WIRELESS COMMUNICATIONS AND NETWORKING 3-Wireless and Cellular Telecommunications
Recommended books and references (scientific journals, reports…)	A number of electronic references and number of specialized websites.
Electronic References, Websites	

Course Description Form

13. Course Name:	
Multimedia Computing	
14. Course Code:	
4CTEC5	
15. Semester / Year:	
Year	
16. Description Preparation Date:	
30/5/2021	
17. Available Attendance Forms:	
Mandatory	
18. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
19. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Tabarak Muhammad Abdul Hussein Email: tabark.mohammed@alkafeel.edu.iq	
20. Course Objectives	
Objectives of the study subject	Learning student with engineering specializations and knowledge about multimedia elements concepts and practical applications which using them at the present time.
21. Teaching and Learning Strategies	
Strategy	The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens.

	Given theoretical and practical lectures based on different and robust resources.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	4	Learn what multimedia is.	Introduction to Multimedia.	Lecture and lab	exams and quizzes
2nd	4	Learn what are the Hyper Text and Hyper Media.	Hyper Text and Hyper Media.	Lecture and lab	exams and quizzes
3rd	4	Learn what the five Components of Multimedia are.	Components of Multimedia.	Lecture and lab	exams and quizzes
4th	4	Have a acknowledgement about the topics and projects in Multimedia fields.	Multimedia Research Topics and Projects.	Lecture and lab	exams and quizzes
5th	4	Learn about the most popular Multimedia applications such as the Internet and e-learning	Multimedia applications.	Lecture and lab	exams and quizzes
6th	4	Learn about the using of Multimedia on the web.	Multimedia on the web.	Lecture and lab	exams and quizzes
7th	4	Learn about Multimedia Data Basics and there specifications.	Multimedia Data Basics	Lecture and lab	exams and quizzes
8th , 9th	8	Investigating various types of graphics and images, as well as how they represent data.	Graphics and Image Data Representation	Lecture and lab	exams and quizzes
10th	4	Investigating how to digitizing various types of graphics and images	Image digitization.	Lecture and lab	exams and quizzes
11th	4	Studying the Spatial resolution and quantization of images.	Spatial resolution and quantization.	Lecture and lab	exams and quizzes
12th	4	Investigating various types of images which used .Widely	Type of image	Lecture and lab	exams and quizzes
13th	4	Investigating various Widely used types of .images like jpg, gif, …etc.	Image file formats	Lecture and lab	exams and quizzes
14th	4	Studying how to perform arithmetic operations on images such as addition and subtraction… etc.	Arithmetic operation on image	Lecture and lab	exams and quizzes
15th	4	Studying how to perform logical operations on images such as AND, OR … etc.	Logical operation on image	Lecture and lab	exams and quizzes
16th	4	Studying the histogram of Image. How to draw it and how to use it.	Image histogram	Lecture and lab	exams and quizzes
17th	4	Learning about modification and equalization of image's Histogram.	Histogram modification and Histogram equalization.	Lecture and lab	exams and quizzes
18th, 19th	8	Learning about the techniques used in compression of Image.	Image compression techniques	Lecture and lab	exams and quizzes
20th	4	Investigating the Basics of Sound and Audio and their frequencies.	Sound and Audio Basics	Lecture and lab	exams and quizzes
21th	4	Studying how to Digitization the sound signals.	Digitization of sound	Lecture and lab	exams and quizzes

22th	4	Studying the Nyquist theorem which used in sampling of sound signals.	Nyquist theorem	Lecture and lab	exams and quizzes
23th	4	Studying the Synthetic sound like MIDI and when they used.	Synthetic sound	Lecture and lab	exams and quizzes
24th	4	Studying the theory of Quantization and transmission of Audio signals.	Quantization and transmission of Audio		
25th	4	Studying the different types of Compression of audio signals.	Compression of audio		
26th	4	Investigating the concepts of video and its basics.	Video Basics		
27th	4	Investigating the different color systems used in video like RGB, CMYK,…etc.	Video color models		
28th	4	Studying the many types of video signals and the differences between them.	Type of video signals		
29th	4	Studying the different types of Compression video.	Video compression		
30th	4	Investigating the using of Multimedia over networks	Multimedia over networks		

23. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Fundamentals of Multimedia, Ze-Nian Mark S. Drew Prentice H 2004Communication, by A. Bruce Carls et at, McGraw-Hill, USA. 2. Digital Image Processing Using MATL Rafael C. Gonzalez, Richard E. Woods, a Steven L. Eddins, Prentice Hall, 2004. 3. Digital video processing, A. M. Teka Prentice Hall, 2005. 4. The data compression book, M Nelson, Imprint: M & T Books, Publish IDG Books Worldwide, Inc., January 1991.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Project management	
2. Course Code:	
4CTEC1	
3. Semester / Year:	
Yearly	
4. Description Preparation Date:	
30/5/2021	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Zaid Saad Alsabea Email: zaid.alsabea@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	Providing the student with engineering specializations with knowledge about project management concepts and research applications
9. Teaching and Learning Strategies	
Strategy	The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens.

	Given theoretical and practical lectures based on different and robust resources.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st,2nd	8	Project management concept	Project management	Lecture and lab	The Exams
3rd,4th	8	Learn about economics and management for engineers	Economics and management for the engineers	Lecture and lab	The Exams
5th, 6th	8	Learn about factory and workshop design	Layout of factories and workshops	Lecture and lab	The Exams
7th	4	Get to know your productivity	Productivity	Lecture and lab	The Exams
8th, 9th	8	Learn about engineering project drawing	Networks	Lecture and lab	The Exams
10th, 11th	8	Learn about the critical path method in project management	Critical path method(CPM)	Lecture and lab	The Exams
12th , 13th ,14th,15th	16	Familiarity with Albert technology (time and cost)	Pet technique (Time and cost)	Lecture and lab	The Exams
16th	4	Recognize resource allocation problems	The resource allocation problems	Lecture and lab	The Exams
17th, 18th	8	Understand the concept of linear equations (formal method, simple method)	Linear programming (graphical method, simplex method)	Lecture and lab	The Exams
19th, 20th,21th	12	Understand the concept of warehousing and its types	Inventory models(Economic order quantity)(EOQ)	Lecture and lab	The Exams
22 th	4	Understand the concept of break-even point in project management	The break-even point	Lecture and lab	The Exams
23 th ,24 th	8	Know the cost of inventory	The cost of inventory	Lecture and lab	The Exams
25 th,26 th, 27 th	12	Understand the concept of maintenance policy and its concepts	Maintenance policy and concepts	Lecture and lab	The Exams
28 th , 29 th	8	Learn about quality control	Quality control	Lecture and lab	The Exams
30 th	4	Understand the concept of employer management	Employer management	Lecture and lab	The Exams

11. Course Evaluation

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Y. Bakouros and V. Kelessidis "Project management" INNOREGIO: dissemination of innovation and knowledge management techniques, January 2000.

	2. J.R. Meredith and S.J. Mantel "Project Management", J. Wiley & Sons, 1995 3. S. Choudhury "Project Management", Tata McGraw Hill – 2003 4. Principles of Project Management, NPC publication
Recommended books and references (scientific journals, reports…)	A number of electronic references and a number of specialized websites.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Security of Computer and Networks	
2. Course Code:	
4CTEC2	
3. Semester / Year:	
Yearly	
4. Description Preparation Date:	
30/5/2021	
5. Available Attendance Forms:	
Compulsory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120h	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Israa Haider Hashem Email: issraa.hayder@alkafeel.edu.iq	
8. Course Objectives	
Objectives of the study subject	Teach students the fundamental concepts about the methods that use to protect data and computer networks
9. Teaching and Learning Strategies	
Strategy	The main learning strategy is the interactive method between the lecturer and students during the class. Also, answer all questions which are sent by email. In addition to guide students to the best and most up-to-date websites and resources. A new lecture is uploaded to the electronic learning platform before it is given to students so that they can look at it and have a glance beforehand. The lecture is designed and presented by using Microsoft PowerPoint slides, as well as the electronic and smart screens.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1st, 2nd, 3rd	12	Understand the fundamental concepts about security and network. In addition to the most commonly used terms to enable students to understand the lectures as well as any other resources they might pick it up	Introduction, Symmetric Ciphers model: plaintext, encryption algorithm, secret key, cipher text, decryption algorithm, A Model of conventional encryption. Cryptography, Cryptanalysis, block and stream cipher	Lecture and computer laboratory	Test, homework, interacting during the class
4th	4	Understand the simplest cipher and decipher techniques, with their characteristics and drawbacks	Caesar Cipher The affine Cipher	Lecture and computer laboratory	Test, homework, interacting during the class
5th , 6th	8	Used most sophisticated cipher techniques as compared with the traditional techniques.	Mono alphabetic substitution ciphers, Shift ciphers	Lecture and computer laboratory	Test, homework, interacting during the class
7th	4	Enable the use of Array in cryptography	Hill cipher	Lecture and computer laboratory	Test, homework, interacting during the class
8th	4	Use look up table as circle to highlight key and plain/ cipher texts	Playfair cipher	Lecture and computer laboratory	Test, homework, interacting during the class
9th	4	Use more complex key to do the encryption and decryption	Polyalphabetic ciphers Vigenere cipher	Lecture and computer laboratory	Test, homework, interacting during the class
10th	4	Divide plaintext into a set of blocks by changing the position of the original plaintext rather than changing the actual characters.	The Transposition cipher	Lecture and computer laboratory	Test, homework, interacting during the class
11th	4	Use Two keys in cryptography as a preparing to introduce the stream cipher	Affine cipher	Lecture and	Test, homework,

				computer laboratory	interacting during the class
12th	4	Use key as a set of bits (zeros, ones) which are generate as randomly.	One-time pad	Lecture and computer laboratory	Test, homework, interacting during the class
13th, 14th, 15th	12	Use one key to encrypt and decrypt a text	Cryptanalysis of a Symmetric key	Lecture and computer laboratory	Test, homework, interacting during the class
16th	4	Use Greater Common Division between two integer numbers	Euclid's Algorithm	Lecture and computer laboratory	Test, homework, interacting during the class
17th, 18th, 19th	12	Modern cryptography includes the use of DES technique which is still use the private key protocol	SYMMETRIC-KEY ALGORITHMS -DES—The Data Encryption Standard, hersسلطان -16 round Feistel system	Lecture and computer laboratory	Test, homework, interacting during the class
20th, 21st	8	Use two different keys: public key for encryption, and private key for decryption such as RSA algorithm	PUBLIC-KEY ALGORITHMS, -RSA, - Other Public-Key Algorithms,	Lecture and computer laboratory	Test, homework, interacting during the class
22nd, 23rd, 24th, 25th	16	Authentication protocol based public key, private key and distribution key	AUTHENTICATION PROTOCOLS, -Authentication Based on a Shared Secret Key,سلطان -Establishing a Shared Key: The Diffie - Hellman Key Exchange,سلطان -Authentication Using a Key Distribution Center,سلطان -Authentication Using Kerberos,سلطان - Authentication Using Public-Key Cryptography,	Lecture and computer laboratory	Test, homework, interacting during the class
26th, 27th	8	OSI security architecture, network security, email security and privacy	OSI security Architecture, a model for network security, EMAIL SECURITY - PGP—Pretty Good Privacy, S/MIME	Lecture and computer laboratory	Test, homework, interacting during the class

28th, 29, 30th	12	OS security, database protection, deep network protection services such as IP, VPN, etc.	Protocols of computer networks PROTECTION SERVICES: □ OS protection service: protected objects and methods of OS protection, security of OS, memory and addressing protection, fence protection □ Database protection service: □ Network protection service: IP and E-Commerce protection, VPN and next generation networks protection	Lecture and computer laboratory	

11. Course Evaluation

Test students to see how much they have been interacting during the class. Also, assessment can be achieved by doing tests for students weekly and monthly, and in two different manners: oral and written tests.

Assessment for students is achieved by doing tests weekly and monthly, and in two manners: oral and written tests.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1. Cryptography and Network Security, 7th Edition 2. Handbook of Applied Cryptography 3. Defensive Security Handbook: Best Practices for Securing Infrastructure 4. Network Monitoring and Analysis: A Protocol Approach to Troubleshooting 5. Network Security Essentials :Application And Standards, 6Th Edition
Recommended books and references (scientific journals, reports…)	Set of electronics resources and so specialized websites
Electronic References, Websites	