

*Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
International Accreditation Dept.*

*Academic Program Specification Form For The
Academic Year 2022-2023*

*University: Al-Farahidi
College : Technical college of Engineering
Number Of Departments In The College : 3
Date Of Form Completion : 01/6/2023*

Dean's Name

Date : / /

Signature

*Dean's Assistant For
Scientific Affairs*

Date : / /

Signature

*The College Quality Assurance
And University Performance
Manager*

Date : / /

Signature

Quality Assurance And University Performance Manager

Date : / /

Signature

TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Programme Title	ABET
4. Title of Final Award	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Annual
6. Accreditation	ABET
7. Other external influences	There is a strong relationship with the labor market, which is willing to hire graduates.
8. Date of production/revision of this specification	01/6/2023
9. Aims of the Programme	
<ul style="list-style-type: none">• Graduating cadres of technical engineers with a high level of understanding, knowledge and psychological qualification, capable of dealing with electronic systems, communication systems and computer networks.• Focusing on the practical aspect and giving it a lot of attention by providing the latest laboratories in terms of equipment and software to ensure that the outputs of the department are technical engineers who have sufficient experience to enable them to enter the labor market.	

- Activating programs that are in the interest of the specialization and are supported by official sponsors around the world, such as the Cisco Certification Program, so that the graduate engineer is armed with international certificates in addition to his academic degree.

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

- A1. The ability to apply knowledge of mathematics, science, and engineering.
- A2. Enable the student to understand the basic concepts of electrical and electronic circuits for computer systems.
- A3. The ability to identify, formulate, and solve engineering problems.
- A4. Enabling the student to control computer systems using different programming languages.
- A5. Enable the student to build computer networks, follow them up, and treat defects in them, if any.
- A6. Enabling the student to apply the theoretical scientific concepts he studied on the ground through graduation projects directed towards specialization.

B. Subject-specific skills

- B1. Enable the student to apply the theoretical concepts that he or she has studied in the laboratory using special electronic panels to identify the most important practical problems, analyze and interpret them, and address the problems resulting from their realistic practical application.
- B2. The ability to design and conduct experiments.
- B3. The ability to implement and maintain systems.
- B4. The ability to use modern engineering methods, tools and skills necessary for engineering work.

Teaching and Learning Methods

- Theoretical and practical lectures.
- Homework and extra-curricular activities.
- Research and reports.

Assessment methods

- Daily Sudden Exams
- Semester exams
- Mid-year and end-of-year exams
- Additional assessments of extra-curricular activities

C. Thinking Skills

- C1. Understand the requirements of the engineering profession and ethical responsibility
- C2. The ability to design systems, components, or processes to meet desired needs, taking into account economic, environmental, social, political, ethical,

health, safety, manufacturability, and sustainability constraints.
C3. Awareness of the need for lifelong learning and the ability to engage in it.
C4. Educating the student to realize the importance of the specialization he is studying and its benefits to the individual and society.

Teaching and Learning Methods

- Ongoing guidance from the department's professors in general, as well as the department's and college's educational and psychological guidance committees.
- Ongoing conversations with students.
- Continuous communication with students through the department's page on social networking sites;

Assessment methods

- Consistent interviews with students, as well as listening to the most important problems and obstacles that students face in order to avoid them.
- Creating customized questionnaires for this purpose.
- Constant monitoring of students and an attempt to assess those who are sluggish.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. The ability to work in a multidisciplinary team.

D2. The ability to communicate and communicate effectively and efficiently.

D3. Understand the impact of engineering solutions on economic and environmental activities and the societal context.

D4. The ability to use modern engineering techniques and skills and tools necessary to practice the engineering profession.

Teaching and Learning Methods

- Groups for graduation project preparation.
- Additional courses in the area of specialization.
- Courses in Information Technology and Networking (IT & Cisco).
- Summer training within companies with a competence close to the nature of the program.

Assessment Methods				
Taking online assessment exams for courses in communications systems, information technology and networks, preparing scientific reports and conducting scientific discussions.				
11. Programme Structure				12. Awards and Credits
Level/Year	Course or Module Code	Course or Module Title	Credit rating	
Year 1	TCE111	Electrical measurements	4	Bachelor Degree Requires (x) credits
Year 1	-----	English Language	2	
Year 1	TCE121	Digital Fundamentals	6	
Year 1	TCE112	Electrical circuits	6	
Year 1	TCE122	Electronics	6	
Year 1	MATH151	Mathematics 1	6	
Year 1	CREQ143	Computer Application 1	4	
Year 1	CREQ142	Electrical Drawing	2	
Year 1	CREQ144	Workshop	4	
Year 1	UREQ161	Human Rights	4	
Year 2	TCE224	Digital Application	6	
Year 2	TCE232	Communication System 1	6	
Year 2	TCE214	Electromagnetic Fields	4	
Year 2	TCE231	Information Theory	6	
Year 2	MATH252	Mathematics 2	6	
Year 2	TCE215	Electric Machine	6	

Year 2	TCE223	Electronic Circuit	6	
Year 2	CREQ245	Computer Application 2	4	
Year 2	UREQ262	Democracy	4	

Year 3	TCE325	Microprocessor	8	Bachelor Degree Requires (x) credits
Year 3	TCE333	Antenna	4	
Year 3	TCE334	Communication Systems/2	6	
Year 3	TCE336	Digital Signal Processing	6	
Year 3	TCE326	Design of Electronic circuits	6	
Year 3	TCE335	Maintenance of communication Systems/1	8	
Year 3	TCE343	Engineering Analysis	6	
Year 3	CREQ345	Computer Application/3	4	

Year 4	TCE437	Communication Systems/3	6	Bachelor Degree Requires (x) credits
Year 4	TCE4310	Security of communication	4	
Year 4	TCE439	Communication and Computer networks	6	
Year 4	TCE438	Modern communication Systems	6	
Year 4	TCE4311	Maintenance of Communication Systems/2	8	
Year 4	TCE416	Control	6	
Year 4	CREQ445	Computer Application/4	4	

Year 4	CREQ467	Production Management	4	
Year 4	CREQ4410	Project	2	

13. Personal Development Planning

Striving to develop curricula and study programs and vaccinate them with all that is modern to keep pace with the rapid development within the field of specialization.

14. Admission criteria .

The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.

15. Key sources of information about the programme

Technical University, since the curricula are unified for this specialization in all Iraqi colleges and universities and international universities related to the specialization.

Curriculum Skills Map

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

			Programme Learning Outcomes																	
Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	
Year 1	TCE111	Electrical measurements	Core	•													•	•		
	-----	English Language	Core																	
	TCE121	Digital Fundamentals	Core	•	•	•		•				•	•	•	•		•	•		
	TCE112	Electrical circuits	Core	•	•	•		•				•	•	•	•		•	•		
	TCE122	Electronics	Core	•	•	•		•				•	•	•	•		•	•		
	MATH151	Mathematics 1	Core	•								•	•	•	•		•			
	CREQ143	Computer Application 1	Core					•		•	•						•	•	•	
	CREQ142	Electrical Drawing	Core	•			•										•			
	CREQ144	Workshop	Core				•	•			•						•			
	UREQ161	Human Rights	Core				•	•			•						•			

Year 2	TCE224	Digital Application	Core	•	•	•		•		•		•	•	•	•		•	•	
	TCE232	Communication System 1	Core	•	•	•		•				•	•	•	•		•	•	
	TCE214	Electromagnetic Fields	Core	•								•	•	•	•		•	•	
	TCE231	Information Theory	Core	•								•	•	•	•		•	•	
	MATH252	Mathematics 2	Core	•								•	•	•		•			
	TCE215	Electric Machine	Core	•				•									•	•	
	TCE223	Electronic Circuit	Core	•	•	•						•	•	•	•		•	•	
	CREQ245	Computer Application 2	Core					•		•	•						•	•	•
	UREQ262	Democracy	Core					•	•		•						•	•	
Year 3	TCE325	Microprocessor	Core	•	•	•		•		•		•	•	•	•		•	•	
	TCE333	Antenna	Core	•	•							•	•	•	•		•		
	TCE334	Communication Systems 2	Core	•	•	•		•		•		•	•	•	•		•		
	TCE336	Digital Signal Processing	Core	•	•							•	•	•	•		•	•	

	TCE326	Design of Electronic circuits	Core	•	•	•		•		•		•	•	•	•		•	•	•
	TCE335	Maintenance of communication Systems 1	Core		•				•							•	•		•
	TCE343	Engineering Analysis	Core	•								•	•	•	•		•		•
	CREQ345	Computer Application 3	Core					•		•	•		•	•					
Year 4	TCE437	Communication Systems 3	Core	•	•	•		•		•		•	•	•	•		•		
	TCE4310	Security of communication	Core	•	•							•	•	•	•		•		
	TCE439	Communication and Computer networks	Core	•	•	•		•		•		•	•	•	•	•	•	•	•
	TCE438	Modern communication	Core	•	•	•		•		•		•	•	•	•		•		
	TCE4311	Maintenance of Communication Systems 2	Core		•				•							•	•		•
	TCE416	Control	Core	•				•		•		•	•	•	•		•	•	
	CREQ445	Computer Application 4	Core					•		•	•						•	•	•
	CREQ467	Production Management	Core	•		•	•						•	•			•	•	
	CREQ4410	Project	Core	•	•	•				•	•		•	•		•	•		

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Electrical measurements
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
	<ul style="list-style-type: none">• Introduce the student to the importance of electrical measurements and types of measuring devices and know the importance of using calibration for these devices.• Providing students with scientific, practical and self-skills that enable them to solve practical problems and deal with them with scientific concepts.

10. Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction to measurements, Important terms, Standards, Electrical Standards, System of Units.	Lecture	Daily Exams + Discussion + Monthly Exams
2	2		Error in Measurement, type of error, sources of error.	Lecture	Daily Exams + Discussion + Monthly Exams
3	2		Statistical Analysis, arithmetic mean, deviation, average deviation, standard deviation.	Lecture	Daily Exams + Discussion + Monthly Exams
4	2		Types of measuring instruments, Electrical principles of operation for analogue instruments (magnetic, electrodynamic, electromagnetic, thermal, chemical, and electrostatic). Essentials of indicating instruments (deflecting torque, controlling torque, and damping torque).	Lecture	Daily Exams + Discussion + Monthly Exams
5	2		Permanent magnet moving coil instrument, Galvanometer.	Lecture	Daily Exams + Discussion + Monthly Exams
6	2		moving iron type instrument.	Lecture	Daily Exams + Discussion + Monthly Exams
7	2		Extension of range by shunt and multipliers(as ammeter and as voltmeter).	Lecture	Daily Exams + Discussion + Monthly Exams
8	2		Multi range instrument.	Lecture	Daily Exams + Discussion + Monthly Exams Quiz
9	2		The electrodynamicometer. Using the dynamometer as ammeter, voltmeter and as wattmeter.	Lecture	Daily Exams + Discussion + Monthly Exams
10	2		Watt-hour meter induction type instrument. Thermocouple instruments.	Lecture	Daily Exams + Discussion + Monthly

					Exams
11	2		Measuring of resistance, classification of resistances, the series and shunt ohmmeter, the megger.	Lecture	Daily Exams + Discussion + Monthly Exams
12	2		The Potentiometer.	Lecture	Written Daily Exams + Discussion + Monthly Exams
13	2		Wheatstone Bridge.	Lecture	Daily Exams + Discussion + Monthly Exams
14	2		AC Bridges (capacitance comparison bridge, inductance comparison bridge, Maxwell's bridge).	Lecture	Daily Exams + Discussion + Monthly Exams
15	2		AC Bridges (Hay's bridge, Schering bridge, and Wien's bridge).	Lecture	Daily Exams + Discussion + Monthly Exams
16	2		Oscilloscope (basic principle, block diagram, applications)	Lecture	Daily Exams + Discussion + Monthly Exams
17	2		Transistor Voltmeter, Solid state voltmeter, Differential Voltmeter.	Lecture	Daily Exams + Discussion + Monthly Exams
18	2		Average responding voltmeter, peak responding voltmeter, true RMS voltmeter.	Lecture	Daily Exams + Discussion + Monthly Exams
19	2		Electronic measuring instruments. Output power meter, Field strength meter, phase meter.	Lecture	Daily Exams + Discussion + Monthly Exams
20	2		Digital Voltmeters (basic principle, ramp technique, dual slope integrating type).	Lecture	Daily Exams + Discussion + Monthly Exams
21	2		Analog to digital conversion (Direct compensation, successive approximation and potentiometer type DVM).	Lecture	Daily Exams + Discussion + Monthly Exams
22	2		Digital Instruments. - Signal conditioning stage (amplification, attenuation, filtering, linearization, -----)	Lecture	Daily Exams + Discussion + Monthly Exams

			Amplification and attenuation (Gain, desible gain). Filtering (fundamental theorem of filters).		
23	2		Digital display system and indicators. Display devices (light emitting diode, liquid crystal display, other displays).	Lecture	Daily Exams + Discussion + Monthly Exams
24	2		Resolution and Sensitivity of digital meters.	Lecture	Daily Exams + Discussion + Monthly Exams
25	2		Digital multimeter, Digital panel meters.	Lecture	Daily Exams + Discussion + Monthly Exams
26	2		Digital frequency meter (principle of operation and basic circuit)	Lecture	Daily Exams + Discussion + Monthly Exams
27	2		Transducers, Electrical transducers (resistive, inductive, capacitive, electromagnetic)	Lecture	Daily Exams + Discussion + Monthly Exams
28	2		Resistive transducers.	Lecture	Daily Exams + Discussion + Monthly Exams
29	2		Inductive transducer, capacitive transducer, pressure cell, photo electric.	Lecture	Daily Exams + Discussion + Monthly Exams
30	2		Other kinds of transducers.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Electrical Circuit Theory and Technology", John Bird
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	English Language
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Teach students to analyze and use the forms and conventions of academic writing, particularly the forms and conventions of argumentative and analytical writing. • Teach students to become a more sophisticated reader, flexible writer and more effective speaker. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

B- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2			Lecture	Daily Exams + Discussion + Monthly Exams
2	2			Lecture	Daily Exams + Discussion + Monthly Exams
3	2			Lecture	Daily Exams + Discussion + Monthly Exams
4	2			Lecture	Daily Exams + Discussion + Monthly Exams
5	2			Lecture	Daily Exams + Discussion + Monthly Exams
6	2			Lecture	Daily Exams + Discussion + Monthly Exams
7	2			Lecture	Daily Exams + Discussion + Monthly Exams
8	2			Lecture	Daily Exams + Discussion + Monthly Exams Quiz
9	2			Lecture	Daily Exams + Discussion + Monthly Exams
10	2			Lecture	Daily Exams + Discussion + Monthly Exams
11	2			Lecture	Daily Exams + Discussion + Monthly Exams
12	2			Lecture	Written Daily

					Exams + Discussion + Monthly Exams
13	2			Lecture	Daily Exams + Discussion + Monthly Exams
14	2			Lecture	Daily Exams + Discussion + Monthly Exams
15	2			Lecture	Daily Exams + Discussion + Monthly Exams
16	2			Lecture	Daily Exams + Discussion + Monthly Exams
17	2			Lecture	Daily Exams + Discussion + Monthly Exams
18	2			Lecture	Daily Exams + Discussion + Monthly Exams
19	2			Lecture	Daily Exams + Discussion + Monthly Exams
20	2			Lecture	Daily Exams + Discussion + Monthly Exams
21	2			Lecture	Daily Exams + Discussion + Monthly Exams
22	2			Lecture	Daily Exams + Discussion + Monthly Exams
23	2			Lecture	Daily Exams + Discussion + Monthly Exams
24	2			Lecture	Daily Exams + Discussion

					+ Monthly Exams
25	2			Lecture	Daily Exams + Discussion + Monthly Exams
26	2			Lecture	Daily Exams + Discussion + Monthly Exams
27	2			Lecture	Daily Exams + Discussion + Monthly Exams
28	2			Lecture	Daily Exams + Discussion + Monthly Exams
29	2			Lecture	Daily Exams + Discussion + Monthly Exams
30	2			Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Digital Fundamentals
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	60 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> Teach students the basic principles of digital and help them understand the work of digital circuits and systems and how to build logical circuits using truth tables. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

C- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
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D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 - 3	4		Number systems: binary ,decimal, octal and hexadecimal number, systems; conversion between number systems.	Lecture	Daily Exams + Discussion + Monthly Exams
4 - 6	4		Binary codes and arithmetic operation of binary system	Lecture	Daily Exams + Discussion + Monthly Exams
7 - 8	4		logic gates, logic circuit, logic equation and truth table (product of sum and sum of product)	Lecture	Daily Exams + Discussion + Monthly Exams
9 - 12	4		Simplification of logic circuit (Boolean algebra and Karnugh maps), ;two, three, four variable K-map; don't care conditions, LMNOPQRSTs laws; NAND-NAND network	Lecture	Daily Exams + Discussion + Monthly Exams
13 - 15	4		half adder; full adder; half subtractor; full subtractor; BCD adder,	Lecture	Daily Exams + Discussion + Monthly Exams
16 - 18	4		Multivibrators: RS flip flop; clocked RS flip flop; D flip flop; T flip flop; JK flip flop; master/slave flip flop.	Lecture	Daily Exams + Discussion + Monthly Exams
19 - 20	4		Counters: 4-bit counter; up counter; down counter; ripple counter; mod-10 counter	Lecture	Daily Exams + Discussion + Monthly Exams
21 - 22	4		registers: serial shift register; parallel shift register; ring counter	Lecture	Daily Exams + Discussion + Monthly Exams Quiz
23 - 26	4		Multiplexer, Dmultiplexer, Decoder, Encoder	Lecture	Daily Exams + Discussion + Monthly Exams
27 - 30	4		input/output: punched card; paper tap; magnetic tap; digital recoding method; terminals	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Digital fundamental", Floyd, L Thomas, 8 th edition
Special requirements (include for example workshops, periodicals, IT software, websites)	2. College library to obtain additional resources for the curriculum. 3. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Electrical circuits
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	60 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> To introduce the student to the basics of general electrical circuits, DC and alternating current circuits, and theories of electrical network analysis, 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

D- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 - 2	4		Current and voltage, resistance and conductance, temperature effects, Ohm's law, power and energy, sources: dependent and independent; current source and voltage source.	Lecture	Daily Exams + Discussion + Monthly Exams
3 - 6	4		Series and parallel circuits: series circuits, voltage divider rule, voltage source in series, parallel circuit, current divider rule, current source in parallel, source conversion, star-delta transformations, Kirchhoff's laws.	Lecture	Daily Exams + Discussion + Monthly Exams
7 - 12	4		Some useful techniques and theorems: mesh analysis (Maxwell loop current method), Nodal analysis, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Substituting theorem.	Lecture	Daily Exams + Discussion + Monthly Exams
13 - 15	4		Sinusoidal Alternating Current (A.C): waveforms definitions, average value, effective (r.m.s) value, the sine wave, phase relation, complex number and mathematical operations	Lecture	Daily Exams + Discussion + Monthly Exams
16 - 19	4		A.C circuits parameters: resistance, inductance, capacitance, impedance, phase angle, power factor, admittance, series and parallel A.C circuits	Lecture	Daily Exams + Discussion + Monthly Exams
20 - 21	4		Network theorems and techniques A.C circuits: mesh analysis, Nodal analysis, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem.	Lecture	Daily Exams + Discussion + Monthly Exams
22 - 23	4		Power in A.C circuit: Active power, reactive power, apparent power, power triangle,	Lecture	Daily Exams + Discussion + Monthly Exams

			power factor correction.		Exams Quiz
24 - 25	4		Resonance: Series resonance, quality factor, selectivity, bandwidth, parallel resonance.	Lecture	Daily Exams + Discussion + Monthly Exams
26 - 27	4		Poly phase system: three phase systems, balance load, unbalance load, power in three phase circuits, wattmeter, three wattmeter method, two wattmeter method.	Lecture	Daily Exams + Discussion + Monthly Exams
28 - 29	4		Magnetic circuit: magnetic field, flux density, Reluctance, ohm's law for magnetic circuit, mutual inductance, self inductance.	Lecture	Daily Exams + Discussion + Monthly Exams
30	4		Circuit transient: direct circuit transient, R-L transient, R-C transient.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Introductory circuit analysis" 2. "Electric circuit", Nelson
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Electronics
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	60 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introduce the student to electronic components manufactured from semiconductors of different types, composition, properties, uses in electronic circuits, their applications and analysis of their electronic circuits. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

E- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 - 3	4		The atom, Bohr's atomic model, electron's energy levels, orbital quantum number, energy bands and their occupancy, valance and conduction bands, Charge carrier in semiconductor:	Lecture	Daily Exams + Discussion + Monthly Exams
4 - 7	4		Semiconductors, basic terms in crystals structure, order, phase, grain, crystalline, polycrystalline, amorphous, closed packed structure, bravuios lattice. types of semiconductors, intrinsic and extrinsic semiconductors , majority and minority carriers, electron conductivity, drift and diffusion currents, electron-hole pair, electron-hole density, and equilibrium of electron-hole concentration, electron-hole concentration in conduction and valance bands. Excess carrier and life time, generation and recombination of carrier, indirect recombination, surface recombination.	Lecture	Daily Exams + Discussion + Monthly Exams
8 - 10	4		P-N junction, formation of depletion layer, junction or barrier voltage, forward biased P-N junction, reveres biased P-N junction	Lecture	Daily Exams + Discussion + Monthly Exams
11 - 15	4		Diode: ideal diode, real diode, junction breakdown, junction capacitance, equivalent circuit of diode, diode with D.C and A.C voltage source, half wave rectifier, full wave rectifier, diode applications: clipper and clamper circuits, voltage doublers, types of diodes, zener diode, light emitting diode, varactor diode, Schottky diode	Lecture	Daily Exams + Discussion + Monthly Exams
16 - 20	4		Bipolar junction transistor (BJT), transistor biasing, transistor circuit configuration, CB	Lecture	Daily Exams + Discussion + Monthly

			configuration, CE configuration, CC configuration, BJT operation regions, active region DC model of BJT, D.C load line, load line and and output characteristics, A.C load line		Exams
21 - 25	4		Transistor equivalent circuit: D.C equivalent circuit, equivalent circuit of CB amplifier, equivalent circuit of CE amplifier, equivalent circuit of CC amplifier, small signal low frequency model, T-model, the h-parameters of CB, CE, CC transistor.	Lecture	Daily Exams + Discussion + Monthly Exams
26 - 30	4		Field effect transistor (FET): junction FET (JFET), static characteristics of a JFET, transfer characteristics, small signal JFET parameters, D.C biasing of a JFET, D.C load line, common source JFET amplifier, advantage of FETs, MOSFET or IGFET-DMOSFET, FET applications	Lecture	Daily Exams + Discussion + Monthly Exams Quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Electronic devices and circuit theory", Robert Boylestad 2. "Electronic Circuit analysis and design",
Special requirements (include for example workshops, periodicals, IT software, websites)	3. College library to obtain additional resources for the curriculum. 4. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Mathematics 1
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	90 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Helping the student to know the laws and mathematical problems necessary to solve simple and complex electrical circuits 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

F- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 - 3	3		Matrices and Determinants:- matrices definition; different types of matrices; transpose of matrix; symmetric matrix; skew-symmetric matrix; equality matrices; addition and subtraction of matrices; multiplication of matrices. Determinants; properties of matrices determinants; Rank of matrix; The inverse of matrix; solution systems of linear equations by: 1- Gramer's Rule; 2- inverse of matrix.	Lecture	Daily Exams + Discussion + Monthly Exams
4 - 5	3		Function's:- coordinates; the distance between two points; slope of the line; equation of the straight lines; Graphs the functions; even and odd functions; translations.	Lecture	Daily Exams + Discussion + Monthly Exams
6 - 8	3		Trigonometric functions and Identities; The Inverse trigonometric functions; Logarithmic and Exponential functions; Hyperbolic functions and Identities; The Inverse of Hyperbolic functions.	Lecture	Daily Exams + Discussion + Monthly Exams
9 - 11	3		Derivatives: - The derivatives; techniques of differentiation; derivatives of functions (trigonometric, hyperbolic, logarithmic and Inverse of it's); The chain Rule; Implicit differentiation.	Lecture	Daily Exams + Discussion + Monthly Exams
12 - 19	3		Integration: - The indefinite Integral; Basic Integration formulas; Integration of functions (trigonometric, hyperbolic and logarithmic functions); Methods of Integration: Integration by parts; Trigonometric substitutions; Integration rational functions by partial	Lecture	Daily Exams + Discussion + Monthly Exams

			fractions; another trigonometric substitution. The Definite Integral: Area under the curve; Area between two curves; Volume by slicing (Disks and Washers); Volume by cylindrical shells; length of plane curve; area of a surface of Revolution.		
20 - 21	3		Complex numbers:- Definitions; operations [addition, subtraction, multiplication and division]; conjugate; Argand diagram; polar form; multiplication and division in polar form; Roots of equations.	Lecture	Daily Exams + Discussion + Monthly Exams
22 - 24	3		Vectors and parametric equations:- components of a vectors; Addition and Subtraction of vector; multiplication by scalars; vector spaces; dot product; cross product; scalar triple product; parametric equation of lines; planes in 3-space; cylindrical and spherical coordinate.	Lecture	Daily Exams + Discussion + Monthly Exams Quiz
25 – 27	3		Polar coordinates:- Polar coordinates systems; relationship between polar and rectangular coordinates; Graphs in polar coordinates; tangent lines and arc length for parametric and polar curves; area in polar coordinates.	Lecture	Daily Exams + Discussion + Monthly Exams Quiz
28 – 30	3		Conic sections: - definitions; the circle; the ellipse; the parabola; the hyperbola; translated conies. Rotation of axes; Second-degree equations. Conic section in polar coordinates	Lecture	Daily Exams + Discussion + Monthly Exams Quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Calculus", Anton, Birems, Davis, 7 th ,
Special requirements (include for example workshops, periodicals, IT software, websites)	2. College library to obtain additional resources for the curriculum. 3. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Computer Application 1
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	30 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • The student learns about basic computer components in general, and then to basic operating systems such as (MS-Dos --Windows), in addition to some printing and drawing programs. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

G- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		تعريف الحاسبة: اجيالها, مكوناتها: المادية (Hardware) و البرمجية (Software) برامجيات النظام والبرامج التطبيقية	Lecture	Daily Exams + Discussion + Monthly Exams
2	3		نظام التشغيل (MS-DOS) : مفهوم نظام التشغيل, اشارة النظام, الاقراص, الادلة و مستوياتها والملفات, اوامر نظام التشغيل الداخلية (Internal commands) والخارجية (External commands) الاوامر الاكثر استخداما.	Lecture	Daily Exams + Discussion + Monthly Exams
3 - 12	3		اوامر نظام التشغيل الداخلية (Internal command Dir, Del, Time, Date, Cls, RD, CD, MD, Echo, prompt, Ren, copy, vol, ver, path external) اوامر التشغيل الخارجية (command Edit, tree, xcopy, format, chkdsk, Diskcopy	Lecture	Daily Exams + Discussion + Monthly Exams
13 - 27	3		<p>نظام التشغيل (Windows): مفهوم نظام وندوز, مزاياه, متطلباته الاساسية, تشغيل النظام, مكونات الشاشة الرئيسية لسطح المكتب (Desktop), مفهوم الايقونة (Icon), اسلوب التعامل مع فعاليات الفأرة, اهمية و مكونات شريط المهام (Task Bar), الاستفادة من (Start) للدخول الى البرامج, مفهوم المهام المحملة, الخروج من النظام واطفاء الحاسبة (Shut down).</p> <p>مفهوم النافذة لأي برنامج والتعرف على مكوناتها الرئيسية, التعامل مع ايقونات سطح المكتب مثل (My Computer, My documents, Recycle Bin</p> <p>التعرف على مكونات (My Computer) من حيث الاقراص, المجلدات والملف وكيفية التعامل مع تهيئة الاقراص المرنة, نسخ المجلدات والملفات والاستفادة من القص و اللصق و معرفة خصائص الاقراص و المجلدات و الملفات, والتعامل مع سلة المهملات وكيفية حذف الملفات واسترجاعها من خلال ماتوفره سلة المهملات في هذا الجانب.</p>	Lecture	Daily Exams + Discussion + Monthly Exams

		<p>الاستفادة من برامج لوحة السيطرة (Control panel) مثل ايقونة (Mouse) وكيفية تغيير خلفية سطح المكتب و التحكم في حافظ الشاشة و تغيير مظهر قوائم النوافذ والوانها , ايقونة (Add, Remove program) في اضافة وحذف البرامج</p> <p>الاستفادة من من خيار (Run) في تنفيذ البرامج بشكل مباشرة كذلك التحول الى اشارة نظام التشغيل (MS-DOS) والتعامل مع اوامره</p> <p>استخدام برامج التسلية مثل (Windows media player) في تشغيل الافلام</p>		
28 - 30	3	<p>مفهوم فايروس الحاسبات (Computer Virus) : كيفية الاصابة , انواعها و معالجتها والتعامل معها من خلال البرامج المضادة (Anti Viruses) والمتوفرة ضمن بيئة نظام التشغيل وندوز</p>	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
<p>Required reading:</p> <ul style="list-style-type: none"> · CORE TEXTS · COURSE MATERIALS · OTHER 	<p>1. "configuring and trouble shooting window XP professional" by Martine Grasdal,</p>
<p>Special requirements (include for example workshops, periodicals, IT software, websites)</p>	<p>2. College library to obtain additional resources for the curriculum.</p> <p>3. View scientific websites to see recent developments in the material.</p>
<p>Community-based facilities (include for example, guest Lectures , internship , field studies)</p>	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Electrical Drawing
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introducing the student to the importance of engineering tools and the ways to use them in drawing engineering landscapes and projections. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

H- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Important of engineering drawing , Engineering drawing instruments	Lecture	Daily Exams + Discussion + Monthly Exams
2	3		Sheet layout and title block	Lecture	Daily Exams + Discussion + Monthly Exams
3	3		kind of inies and their application	Lecture	Daily Exams + Discussion + Monthly Exams
4	3		Lettering, graphic geometry (applied geometry)	Lecture	Daily Exams + Discussion + Monthly Exams
5	3		orthographic drawing (projection)	Lecture	Daily Exams + Discussion + Monthly Exams
6	3		dimensions	Lecture	Daily Exams + Discussion + Monthly Exams
7 - 12	3		picturical drawing (isometric)	Lecture	Daily Exams + Discussion + Monthly Exams
13	3		missing views	Lecture	Daily Exams + Discussion + Monthly Exams
14-15	3		sectional views	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Workshop
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	180 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • The student will be able to identify electronic components and their use in building and soldering simple circuits, as well as examine the components of electronic circuits. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

I- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	6		كيفية استخدام اجهزة القياس المختلفة في الورشة مثل (افوميتر – مرسمة الذبذبات – مجهزة القدرة)	Lecture	Daily Exams + Discussion + Monthly Exams
2	6		كيفية استخدام الكاويات – انواع الكاويات المستخدمة في الورشة – التدريب على اللحام بالكاوية	Lecture	Daily Exams + Discussion + Monthly Exams
3	6		انواع اللحام المستخدم – المواد المساعدة للحين – لحام بعض الاسلام مع بعضها ومع بعض المكونات	Lecture	Daily Exams + Discussion + Monthly Exams
4	6		كيفية استخدام الكاوية الماصة للحام – العدد الماص للحام – مثل (sucker solder) المشبكات السلكية الماصة للحام (solder removal) – التدريب على بعض المكونات الالكترونية ورفعها من اللوح المطبوع	Lecture	Daily Exams + Discussion + Monthly Exams
5	6		الدوائر الالكترونية المطبوعة المختلفة – التعرف على كيفية تنقيتها وتثبيت المكونات المختلفة عليها	Lecture	Daily Exams + Discussion + Monthly Exams
6 - 7	6		الانواع المختلفة من حيث المادة المصنعة منها المقاومات القدرة التي تتحملها كل مقاومة – كيفية قراءة المقاومات بالطرق المختلفة – المقاومات المتغيرة – والخاصة وكيفية فحصها	Lecture	Daily Exams + Discussion + Monthly Exams
8 - 9	6		عمل دائرة لربط المقاومات على التوالي – عمل دائرة لربط المقاومات على التوازي – عمل دائرة لربط المقاومات على التوالي و التوازي – فحص الدائرة	Lecture	Daily Exams + Discussion + Monthly Exams
10	6		الانواع المختلفة للمتسعات من حيث نوع العازل المستخدم بين الواح المتسعة , الجهد الذي تتحمله المتسعة , قراءة قيم المتسعات بالطرق المختلفة في الترميز , كيفية فحص المتسعات وطرق تبديلها	Lecture	Daily Exams + Discussion + Monthly Exams
11	6		عمل دائرة لربط المتسعات على التوازي والتوالي والمختلط على اللوح المطبوع مع الفحص	Lecture	Daily Exams + Discussion + Monthly Exams
12	6		الانواع المختلفة من المفاتيح المستخدمة في الاجهزة الالكترونية وطرق فحصها, التيار الذي يتحمله كل مفتاح, استعمال كل نوع	Lecture	Daily Exams + Discussion + Monthly Exams
13	6		انواع المصهرات المستخدمة في الدوائر الالكترونية, انواع واقطار الاسلاك المستعملة في المصهرات, التيار الذي يتحمله كل نوع,	Lecture	Daily Exams + Discussion + Monthly

			كيفية اصلاح المصهرات		Exams
14	6		الملفات, انواعها, طرق فحصها, استخداماتها, تجديد الاعطال, قراءة انواع الملفات التي تستعمل رموز الالوان في ترقيمتها, المحولات الكهربائية , انواعها, فحصها, تجديد نوع المحولة, المحولة الذاتية, الفرق بين المحولة الذاتية وبين المحولة الاعتيادية.	Lecture	Daily Exams + Discussion + Monthly Exams
15	6		الانواع المختلفة لأشباه الموصلات (دايود, ترانزستور, ...الخ) من حيث كيفية تصنيعها و المواد المستخدمة في تصنيعها, الطرق المستخدمة في ترقيمتها, ايجاد المكافئات لها.	Lecture	Daily Exams + Discussion + Monthly Exams
16	6		الانواع المختلفة لأشباه الموصلات (دايود, ترانزستور, ...الخ) ترانزستورات و الدايودات العاطلة والصالة لمجموعة منها.	Lecture	Daily Exams + Discussion + Monthly Exams
17	6		الدوائر الالكترونية المتكاملة (Integrate circuit) التعرف على ترقيم الاطراف لعدة انواع من هذه الدوائر, كيفية صناعة هذه الدوائر , المكونات الدخلة في التصنيع.	Lecture	Daily Exams + Discussion + Monthly Exams
18	6		الكاوية المستخدمة في لحام الدوائر الالكترونية المتكاملة, الاسلوب الصحيح في لحام ال (IC), كيفية ازالة اللحام من على اطراف الدائرة الالكترونية المطبوعة ورفعها من الدائرة.	Lecture	Daily Exams + Discussion + Monthly Exams
19	6		كيفية قراءة الخرائط الالكترونية وكيفية تتبع الاعطال لتحديد موقع العطل, اسباب العطل.	Lecture	Daily Exams + Discussion + Monthly Exams
20	6		تعريف الطالب على كيفية تصميم الدوائر الالكترونية على اللوح المطبوع و تثبيت المكونات الالكترونية عليه, كيفية اللحام لهذه المكونات دائرة بسيطة).	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Human Rights
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 1
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
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10. Learning Outcomes, Teaching ,Learning and Assessment Method

J- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2			Lecture	Daily Exams + Discussion + Monthly Exams
2	2			Lecture	Daily Exams + Discussion + Monthly Exams
3	2			Lecture	Daily Exams + Discussion + Monthly Exams
4	2			Lecture	Daily Exams + Discussion + Monthly Exams
5	2			Lecture	Daily Exams + Discussion + Monthly Exams
6 - 7	2			Lecture	Daily Exams + Discussion + Monthly Exams
8 - 9	2			Lecture	Daily Exams + Discussion + Monthly Exams
10	2			Lecture	Daily Exams + Discussion + Monthly Exams
11	2			Lecture	Daily Exams + Discussion + Monthly Exams
12	2			Lecture	Daily Exams + Discussion + Monthly Exams
13	2			Lecture	Daily Exams + Discussion + Monthly Exams
14	2			Lecture	Daily Exams

					+ Discussion + Monthly Exams
15	2			Lecture	Daily Exams + Discussion + Monthly Exams
16	2			Lecture	Daily Exams + Discussion + Monthly Exams
17	2			Lecture	Daily Exams + Discussion + Monthly Exams
18	2			Lecture	Daily Exams + Discussion + Monthly Exams
19	2			Lecture	Daily Exams + Discussion + Monthly Exams
20	2			Lecture	Daily Exams + Discussion + Monthly Exams
21	2			Lecture	Daily Exams + Discussion + Monthly Exams
22	2			Lecture	Daily Exams + Discussion + Monthly Exams
23	2			Lecture	Daily Exams + Discussion + Monthly Exams
24	2			Lecture	Daily Exams + Discussion + Monthly Exams
25	2			Lecture	Daily Exams + Discussion + Monthly Exams
26	2			Lecture	Daily Exams + Discussion + Monthly

					Exams
27	2			Lecture	Daily Exams + Discussion + Monthly Exams
28	2			Lecture	Daily Exams + Discussion + Monthly Exams
29	2			Lecture	Daily Exams + Discussion + Monthly Exams
30	2			Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Digital Application
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	60 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> Teaching the students to design advanced logical circuits that help to understand the structure of electronic computers and microprocessors. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

K- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 3	4		Counters: asynchronous counter, Design of asynchronous counters, synchronous counters, Design of synchronous counters	Lecture	Daily Exams + Discussion + Monthly Exams
4 – 5	4		Shift Register, Serial shift register, parallel shift register, shift register counters	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 8	4		Combinational circuits: Decoders, Encoders, Decoder Expansion, Multiplexer, Demultiplexer, Expansion of multiplexer	Lecture	Daily Exams + Discussion + Monthly Exams
9 – 13	4		Synchronous sequential circuit: Basic design steps, Mealy state model, Serial adder example, design of counter using sequential circuit	Lecture	Daily Exams + Discussion + Monthly Exams
14 – 18	4		Asynchronous sequential circuit: analysis of asynchronous circuit, synthesis of asynchronous circuit, state reduction, state assignment, hazard	Lecture	Daily Exams + Discussion + Monthly Exams
19 – 21	4		Test of logic circuit, fault model, path sensitizing, random test, test of sequential circuit	Lecture	Daily Exams + Discussion + Monthly Exams
22 – 25	4		Memory: types of memory, semiconductor memories, ROM, RAM, Memory expansion: word length expansion, word capacity expansion	Lecture	Daily Exams + Discussion + Monthly Exams
26 – 28	4		D/A and A/D converter, types of D/A, types of A/D, D/a accuracy and resolution	Lecture	Daily Exams + Discussion + Monthly Exams
29 - 30	4		Introduction to Microprocessor	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Digital fundamental", Floyd, L Thomas, 8 th edition 2. "Integrated Electronics, Analog and digital circuits and systems", Millman Halkias, Mcgraw-Hill
Special requirements (include for example workshops, periodicals, IT software, websites)	3. College library to obtain additional resources for the curriculum. 4. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Communication System 1
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	60 hours Theoretical and 90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> To familiarize the student with the performance of the main aspects of communication systems (recognition of analogue modulation techniques and dealing with signal generation, transmission and reception systems). 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

L- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 5	5		Signals, spectrum, and filters: singularity functions; periodic signals and Fourier series; nonperiodic signals and Fourier transform; convolution and impulses system response and filters; correlation and spectral density; Parseval's theorem for energy signals.	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 8	5		Noise: Band-limited white noise; thermal noise; noise figure.	Lecture	Daily Exams + Discussion + Monthly Exams
9 – 12	5		Linear modulation: double-sideband modulation AM and DSB modulators and transmitters; SSB and VSB; frequency conversion; detection and receivers; frequency division multiplexing.	Lecture	Daily Exams + Discussion + Monthly Exams
13 – 15	5		Amplitude modulation: the AM transmission: the AM spectrum; power considerations; phasor representation; AM modulators; other AM transmitter.	Lecture	Daily Exams + Discussion + Monthly Exams
16 – 18	5		Exponential modulation: fundamental concepts; FM spectral analysis; FM bandwidth phase modulation (PM); transmitters and receivers	Lecture	Daily Exams + Discussion + Monthly Exams
19 – 21	5		Frequency modulation: the FM spectrum; phasor representation; narrowband FM; broadband FM; FM generation; FM transmitter; interference and noise; the PM spectrum PM/FM transmitter.	Lecture	Daily Exams + Discussion + Monthly Exams
22 – 23	5		Noise in CW modulation: system models and parameters; interference noise in linear modulation ;noise in exponential modulation; comparison of CW modulation system	Lecture	Daily Exams + Discussion + Monthly Exams

24 - 30	5		Sampling and pulse modulation: sampling theory and practice, analog pulse modulation; PAM, PDM and PPM, pulse-code modulation PCM, DM, and DPCM; time-division multiplexing	Lecture	Daily Exams + Discussion + Monthly Exams
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12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Introduction to Communication systems", Ferrel G.Stremmer -1 2. "Communication Systems, Analog and digital" by Sanjay Sharma.
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Electric Fields
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introduce the student to the study of the theories of electric and magnetic fields 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

M-Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 4	2		Vector Analysis. Scalars And Vectors. Vector Algebra. The Cartesian Coordinate System. Vector Component And Unit Vectors. The Vector Field. Dot Product. Cross Product. Cylindrical Coordinate. Spherical Coordinate. Transformation Between Coordinates. Del Operator. Laplacian Operator. Gradient, Divergence and Curl. Null Identities.	Lecture	Daily Exams + Discussion + Monthly Exams
5 –6	2		Coulomb law. Electric field intensity. Field due to continuous volume charge. Field of line charge. Field of sheet charge.	Lecture	Daily Exams + Discussion + Monthly Exams
8 – 10	2		Electric Flux Density. Gauss Law. Application of Gauss Law. Maxwell First Equation (Electrostatics).	Lecture	Daily Exams + Discussion + Monthly Exams
11 – 14	2		Energy and Potentials, in A Moving Point Charge in An Electric Field. The Line Integral. Definition of Potential Difference and Potential. The Potential Field of A Point Charge. Conservative Property. Potential Gradient. The Dipole. Energy Density in The Electric Field.	Lecture	Daily Exams + Discussion + Monthly Exams
15 – 18	2		Conductors, Dielectric and Capacitance. Current and Current Density. Continuity of Current. Metallic Conductor. Boundary Conditions. Image Theory. Semiconductor. Dielectric Materials. Capacitance. Example of Capacitance.	Lecture	Daily Exams + Discussion + Monthly Exams
19	2		Pisson and Laplace Equations.	Lecture	Daily Exams + Discussion + Monthly Exams
20 – 23	2		The Steady Magnetic Field. Biot-Savar Law. Amperes	Lecture	Daily Exams + Discussion

			Circuital Law. Magnetic Flux and Magnetic Flux Density. The Scalar and Vector Magnetic Potentials. Derivation of The Steady Magnetic Field Law.		+ Monthly Exams
24 - 26	2		Time varying fields and Maxwell equations. Faraday law. Displacement current. Maxwell equations in point form. Maxwell equation in integral form. The retarded potentials.	Lecture	Daily Exams + Discussion + Monthly Exams
27 - 30	2		The Uniform Plane Wave. Wave Equation. Wave Propagation in Free Space. Wave Propagation in Dielectric. The Poynting Vector And Power Consideration. Propagation in Good Conductors. Skin Effect. Wave Polarization.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Electromagnetic fields", by Hyte - 2. "Theory and application of Electromagnetic field" by J.k Methal
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Information Theory
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	90 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student learns about the foundations of probability, methods of encoding voice and language, and the possibility of error in sending and receiving them. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

N- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 2	3		Probability theory: events axioms of probability; simple probability; joint probability; conditional probability; statistical independence; Bay's theorem.	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 4	3		Information and quantification: self information; source entropy; source entropy rate; marginal entropies; joint and conditional entropies; mutual information; transinformation.	Lecture	Daily Exams + Discussion + Monthly Exams
5	3		Distribution function: Binomial distribution; normal distribution (Gaussian); Poisson distribution; multinomial distribution.	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 10	3		Types of channels and channel capacity; continuous channels (Gaussian); channel capacity of Gaussian channel; discrete channel; symmetric channel; nonsymmetrical channel; other special channels (lossless channels, deterministic channels, and noiseless channels); channel capacity of discrete channels; channel capacity and redundancy; cascading of channels; Marcov chain; entropy of Marcov sources; communication channels as Marcov process.	Lecture	Daily Exams + Discussion + Monthly Exams
11	3		Error probability and optimum decision threshold (ODT): binary signals; ternary signals; block error probability.	Lecture	Daily Exams + Discussion + Monthly Exams
12 – 14	3		Source coding: source coding of discrete sources; average code length; code efficiency and redundancy; fixed and variable length codes; Shannon-Fano code; Huffman code.	Lecture	Daily Exams + Discussion + Monthly Exams
15 – 26	3		Channel coding: error detecting codes; error correcting	Lecture	Daily Exams + Discussion

			codes; systematic and nonsystematic codes; Hamming distance; Hamming bound; Hamming weight; linear block codes; encoding of linear block codes; decoding of linear block codes; cyclic codes; systematic and nonsystematic codes; encoding with an (n-k) stage shift register; encoding with a k-stage shift register; syndrome calculation and error detection; convolution codes; Viterbi algorithm.		+ Monthly Exams
27	3		Some compression techniques.	Lecture	Daily Exams + Discussion + Monthly Exams
28 - 30	3		Voice, image, and video coding; Voice, image, and video compression'	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Information Transmission Modulation", M. Schwartz 2. "Modern Communication system", Coates
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Mathematics 2
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	90 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student is introduced to solving differential equations and using them in solving electrical and electronic circuits, as well as identifying sequences and using them in analyzing periodic and non-periodic signals. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

O- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 2	3		Sequence and series:- sequence ;series for convergence and divergence test; Maclaurin and Taylor series; Power series.	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 6	3		Fourier series and transform:- periodic function; even and odd functions; Fourier series ; a periodic functions; Fourier transform ;properties; convolution theorem; Fourier Integral.	Lecture	Daily Exams + Discussion + Monthly Exams
7 – 8	3		Functions for two or more variables:- Graphs of function of two variable; partial derivatives ;the chain rule; the total differential of the function; directional derivative and gradients.	Lecture	Daily Exams + Discussion + Monthly Exams
9 – 10	3		Multiple Integral:- double integrals; double integral over nonrectangular regions; double integral in polar coordinates ; triple integral; triple integral in cylindrical and spherical coordinates.	Lecture	Daily Exams + Discussion + Monthly Exams
11 – 12	3		Topics in vector calculus: - vector field; orthogonal vector; vector norm; eigen value and eigen vector; line integrals; application of surface integral (flux); the divergence theorem; stack's theorem.	Lecture	Daily Exams + Discussion + Monthly Exams
13 – 15	3		Ordinary differential equation of first order:- basic concepts in differential equations; variable separable; equation's reducible to separable form; homogenous equations and non homogenous equations; exact and non exact differential equations; integrating factor; linear first order differential equations;	Lecture	Daily Exams + Discussion + Monthly Exams
16 – 23	3		Ordinary differential equations of second order:- homogenous linear second order; homogeneous with constant coefficients; roots of characteristics equations	Lecture	Daily Exams + Discussion + Monthly Exams

			, initial condition and boundary condition; non homogeneous second order differential equations; complex methods for obtaining particular solutions (undetermined coefficients); Cauchy equation; Variation of parameters method;		
24	3		High order differential equations: - basic concepts; solution of high order characteristics equation.	Lecture	Daily Exams + Discussion + Monthly Exams
25 - 26	3		System of differential equations:- basic concepts; solution by using method of elimination ; solution by using matrices; application of differential equations.	Lecture	Daily Exams + Discussion + Monthly Exams
27 - 30	3		Power series: basics of power series method; using power series to solve differential equation; extend power series for identical equations; extend power series with non identical equations (Frobenius method).	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Advance Mathematics"
Special requirements (include for example workshops, periodicals, IT software, websites)	3. College library to obtain additional resources for the curriculum. 4. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Electric Machine
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	60 hours Theoretical and 90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> Introducing the student to the theories of the work of DC and AC machines, transformers, and the operation of electrical machines. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

P- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	5		Introduction to electrical machines, Classification of electrical machines, Construction of rotating machines.	Lecture	Daily Exams + Discussion + Monthly Exams
2	5		DC machine construction.	Lecture	Daily Exams + Discussion + Monthly Exams
3	5		EMF equation, Torque equation and speed equation of DC machine.	Lecture	Daily Exams + Discussion + Monthly Exams
4	5		DC generators (classification of DC generators and characteristic curves for each type).	Lecture	Daily Exams + Discussion + Monthly Exams
5	5		Losses and Efficiency of DC generators.	Lecture	Daily Exams + Discussion + Monthly Exams
6	5		DC Motors (classification of DC motors and characteristic curves for each type).	Lecture	Daily Exams + Discussion + Monthly Exams
7	5		Speed control of DC motors.	Lecture	Daily Exams + Discussion + Monthly Exams
8	5		Starting of DC motors.	Lecture	Daily Exams + Discussion + Monthly Exams
9	5		Testing of DC machines.	Lecture	Daily Exams + Discussion + Monthly Exams
10	5		Uses of DC motors.	Lecture	Daily Exams + Discussion + Monthly Exams

11	5		Transformers (Basic principle, construction of single phase transformer, and EMF equation)	Lecture	Daily Exams + Discussion + Monthly Exams
12	5		Transformer Equivalent Circuit.	Lecture	Daily Exams + Discussion + Monthly Exams
13	5		Tests on transformers. Losses and Efficiency.	Lecture	Daily Exams + Discussion + Monthly Exams
14	5		Current and voltage transformers, auto transformer, 3-phase power transformers.	Lecture	Daily Exams + Discussion + Monthly Exams
15	5		Three phase induction motors (construction, theory of rotating magnetic field, speed and slip).	Lecture	Daily Exams + Discussion + Monthly Exams
16	5		Equivalent circuit of 3-phase IM, Torque – slip, and torque speed characteristics.	Lecture	Daily Exams + Discussion + Monthly Exams
17	5		Tests on IM, Losses, power stages, and Efficiency.	Lecture	Daily Exams + Discussion + Monthly Exams
18	5		Starting and speed control of 3-phase IM,	Lecture	Daily Exams + Discussion + Monthly Exams
19	5		Single phase motors (classification, methods of rotating field production)	Lecture	Daily Exams + Discussion + Monthly Exams
20	5		Equivalent circuit of single phase IM.	Lecture	Daily Exams + Discussion + Monthly Exams
21	5		Tests on single phase IM, Losses and Efficiency.	Lecture	Daily Exams + Discussion + Monthly Exams
22	5		Synchronous Machines (general theory and construction).	Lecture	Daily Exams + Discussion + Monthly Exams
23	5		Alternator equivalent circuit, voltage equation, phasor	Lecture	Daily Exams + Discussion

			diagram, and voltage regulation.		+ Monthly Exams
24	5		Load characteristic of alternator, Input and output power equations.	Lecture	Daily Exams + Discussion + Monthly Exams
25	5		Synchronous Motors (principle of operation and phasor diagram),	Lecture	Daily Exams + Discussion + Monthly Exams
26	5		Load characteristic of synchronous motor, Input and output power equations, max. output power.	Lecture	Daily Exams + Discussion + Monthly Exams
27	5		Torque equation, methods of starting, and applications of synchronous Motors.	Lecture	Daily Exams + Discussion + Monthly Exams
28	5		Special purpose motors, linear motors, stepper motors.	Lecture	Daily Exams + Discussion + Monthly Exams
29	5		DC Servomotors and AC Servomotors.	Lecture	Daily Exams + Discussion + Monthly Exams
30	5		Conversion from AC to DC.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Electronic Circuit
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	60 hours Theoretical and 90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introduce the student to the design of the operation amplifier circuits, the different power amplifier circuits, and the design of the different oscillator circuits. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

Q- Knowledge and Understanding

- A1. The ability to apply knowledge in mathematics and engineering sciences.
- A2. Ability to identify, formulate and solve engineering problems.
- A3. Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 6	5		Operational Amplifiers: the basic operational amplifier the D coupled differential amplifier; transfer characteristics of a differential offset error voltage and currents; measurement of operational amplifier parameters; frequency response of operational amplifiers.	Lecture	Daily Exams + Discussion + Monthly Exams
7 – 12	5		Linear analog system:- basic operational amplifier applications, differential dc amplifiers analog integrator and differential active filters integrated circuit tuned amplifier, A cascade audio amplifier comparators sample and hold circuits precision AC/DC convertors logarithmic amplifiers, waveform generators generative comparator (Schmitt trigger).	Lecture	Daily Exams + Discussion + Monthly Exams
13 – 19	5		Power amplifiers:- class A large-signal amplifiers secondharmonic distortion, higher-order harmonic generation; the transformer-coupled audio power amplifier efficiency; pushpull amplifier class B amplifier; class AB; operation regulated power supply series voltage regulator.	Lecture	Daily Exams + Discussion + Monthly Exams
20 – 25	5		Feedback amplifiers:- the feedback concept; the transfer gain with feedback characteristics of negative feedback amplifiers; input resistance; output resistance; method of analysis of a feedback amplifier, voltage-series feedback, a voltage-series feedback pair, current-series feedback, current-shunt feedback, voltage-shunt feedback.	Lecture	Daily Exams + Discussion + Monthly Exams
26 – 30	5		Oscillators:- type of oscillators; oscillators pairs; the Hartley	Lecture	Daily Exams + Discussion

		oscillators; the Colpitt oscillators ; the ultra audio oscillators; crystal oscillators; crystal and temperature coefficients; crystal heater chambers; crystal holders; other crystal circuits; some high-frequency oscillators; audio oscillators; dynatron oscillators; RC oscillators; parasitic oscillators; indication of oscillators; oscillators stability.		+ Monthly Exams
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12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Integrated Electronic", Millinan 2. "Integrated Electronics analog and Digital, circuit and system", Jacob Millman
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Computer Application 2
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	30 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • A continuation of the laboratory experience gained in the first year, in which the student learns the basics and applications of different programming languages, the most important of which is (Visual Basic), being one of the advanced programming methods. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

R- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 3	3		<p>مفهوم الشبكات (Network) وانواعها , مفهوم الانترنت (Internet) , تشغيله, <ul style="list-style-type: none"> • وصف الشاشة الرئيسية و مكوناتها, كيفية الاتصال مع الشبكة العالمية (Web) • الاستفادة من محركات البحث المشهورة مثل (Google, Yahoo) • التعرف على طرق البحث عن المعلومات و الوصول اليها. </p>	Lecture	Daily Exams + Discussion + Monthly Exams
4 – 6	3		<p>الخوارزميات والمخططات الانسيابية (Flowcharts) واهميتها في البرمجة.</p>	Lecture	Daily Exams + Discussion + Monthly Exams
7	3		<p>مدخل الى لغة (Visual Basic) وبيئة البرنامج. ماهي لغة (VB), هيكل تطبيقاتها (VB), التعرف على شاشة البرنامج, خطوات انشاء وتطبيق (مدخل الى بيئة المستخدم, خواص مفاتيح التحكم, اضافة الشفرة المصدرية) (Code , Label, Text, Command)</p>	Lecture	Daily Exams + Discussion + Monthly Exams
8	3		<p>التعبير الرياضية (Expressions in VB) (>1= , + , - , > . < , * , / ,etc. .)</p>	Lecture	Daily Exams + Discussion + Monthly Exams
9	3		<p>دوال ال (VB) (1ABS , ASC , Chr , Cos , Date , Rnd ,) (Sin ,etc..)</p>	Lecture	Daily Exams + Discussion + Monthly Exams
10	3		<p>عبارة (IF) واستخداماتها وحالاتها المختلفة (If/then , if/then/endif) if/then/else/end if , Select case , (Go to</p>	Lecture	Daily Exams + Discussion + Monthly Exams
11	3		<p>الحلقات التكرارية (Looping) (Do while , Do until , Do/loop while) (, Do/loop until , for/Next</p>	Lecture	Daily Exams + Discussion + Monthly Exams
12 – 15	3		<p>التعرف على الادوات المختلفة (صندوق الادوات) Tool box A- From , Message Box , Command Buttons , Label Bones , Text Boxes. B- Check Boxes , Option Buttons , Control Arrays , Frames , List Boxes , Combo Boxes. C- Scroll bars, line shape, picture, image, drive list box,</p>	Lecture	Daily Exams + Discussion + Monthly Exams

			(directory/file), list box. D- Common dialog box, open common dialog box, save as common dialog box		
16	3		انشاء تطبيق (VB) مستقل (stand-alone VB application)	Lecture	Daily Exams + Discussion + Monthly Exams
17	3		اضافة قوائم الاوامر الى تطبيق (VB), (adding menus to an application), والتعرف على استخدام محرر القوائم (menu editor)	Lecture	Daily Exams + Discussion + Monthly Exams
18	3		انشاء تطبيقات (VB) تشغيلية (creating VB executable file), تصميم الايقونات (icon), استخدام (VB package & deployment wizard)	Lecture	Daily Exams + Discussion + Monthly Exams
19	3		التحكم بالأخطاء في البرنامج المصمم (error handling, debugging)	Lecture	Daily Exams + Discussion + Monthly Exams
20	3		التعامل مع الملفات النصية (text files) (open/close file, read from file,)	Lecture	Daily Exams + Discussion + Monthly Exams
21	3		تقنيات الرسم باستخدام (VB) (pset, current X, current Y, line, circle, CLS) الطباعة باستخدام VB_	Lecture	Daily Exams + Discussion + Monthly Exams
22	3		العمل مع الالوان (colors), التعرف على احداث الفأرة (mouse down, mouse up),	Lecture	Daily Exams + Discussion + Monthly Exams
23	3		اداة المؤقت (time) خواص الوقت, تقنيات الحركة (animation) الارقام العشوائية و مدخل الى تصميم الالعاب	Lecture	Daily Exams + Discussion + Monthly Exams
24	3		ملفات الصوت والوسائط المتعددة (sounds & multimedia)	Lecture	Daily Exams + Discussion + Monthly Exams
25 - 26	3		التعرف على استخدام بعض المفاتيح المتقدمة (advanced keys) chart controls, rich text box, slider, tabbed dialog, (multiple forms)	Lecture	Daily Exams + Discussion + Monthly Exams
27 - 30	3		امثلة و برامج تطبيقية متنوعة	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Democracy
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 2
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • A continuation of the laboratory experience gained in the first year, in which the student learns the basics and applications of different programming languages, the most important of which is (Visual Basic), being one of the advanced programming methods. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

S- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2			Lecture	Daily Exams + Discussion + Monthly Exams
2	2			Lecture	Daily Exams + Discussion + Monthly Exams
3	2			Lecture	Daily Exams + Discussion + Monthly Exams
4	2			Lecture	Daily Exams + Discussion + Monthly Exams
5	2			Lecture	Daily Exams + Discussion + Monthly Exams
6	2			Lecture	Daily Exams + Discussion + Monthly Exams
7	2			Lecture	Daily Exams + Discussion + Monthly Exams
8	2			Lecture	Daily Exams + Discussion + Monthly Exams
9	2			Lecture	Daily Exams + Discussion + Monthly Exams
10	2			Lecture	Daily Exams + Discussion + Monthly Exams

11	2			Lecture	Daily Exams + Discussion + Monthly Exams
12	2			Lecture	Daily Exams + Discussion + Monthly Exams
13	2			Lecture	Daily Exams + Discussion + Monthly Exams
14	2			Lecture	Daily Exams + Discussion + Monthly Exams
15	2			Lecture	Daily Exams + Discussion + Monthly Exams
16	2			Lecture	Daily Exams + Discussion + Monthly Exams
17	2			Lecture	Daily Exams + Discussion + Monthly Exams
18	2			Lecture	Daily Exams + Discussion + Monthly Exams
19	2			Lecture	Daily Exams + Discussion + Monthly Exams
20	2			Lecture	Daily Exams + Discussion + Monthly Exams
21	2			Lecture	Daily Exams + Discussion + Monthly Exams
22	2			Lecture	Daily Exams + Discussion + Monthly Exams
23	2			Lecture	Daily Exams + Discussion

					+ Monthly Exams
24	2			Lecture	Daily Exams + Discussion + Monthly Exams
25	2			Lecture	Daily Exams + Discussion + Monthly Exams
26	2			Lecture	Daily Exams + Discussion + Monthly Exams
27	2			Lecture	Daily Exams + Discussion + Monthly Exams
28	2			Lecture	Daily Exams + Discussion + Monthly Exams
29	2			Lecture	Daily Exams + Discussion + Monthly Exams
30	2			Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Microprocessor
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	90 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The course aims to give the student a basic idea of the architecture of the installation and programming of microprocessors, and to understand their operation. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

T- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 2	5		Architecture of 8085 microprocessor: Block diagram; registers ALU; control unit.	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 8	5		Instructions set and programming of 8085 microprocessors	Lecture	Daily Exams + Discussion + Monthly Exams
9 – 10	5		Stack and Subroutine	Lecture	Daily Exams + Discussion + Monthly Exams
11 – 12	5		Time delay and Counters	Lecture	Daily Exams + Discussion + Monthly Exams
13 – 15	5		Interrupts	Lecture	Daily Exams + Discussion + Monthly Exams
16	5		Addressing modes	Lecture	Daily Exams + Discussion + Monthly Exams
17 – 18	5		Pin out of 8085 microprocessor ,Buses system, and Control signals.	Lecture	Daily Exams + Discussion + Monthly Exams
19 – 21	5		Memories: Type of memory; storage element; memory addressing multi chips memory	Lecture	Daily Exams + Discussion + Monthly Exams
22 - 23	5		fetch and execute cycle	Lecture	Daily Exams + Discussion + Monthly Exams
24 – 25	5		Interfacing I/O devices	Lecture	Daily Exams + Discussion + Monthly Exams
26 - 30	5		8086 microprocessor: Block diagram; architecture; registers; pin out; Introduction to programming.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Microprocessor Architecture, programming and application with 8085", Ramesh S. Gaonkar 2. "Microprocessor 8085 Architecture, programming and interfacing", Ajay Wadhwa, Eastern Economy Edition.
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Antenna
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student learns about antennas, their types, characteristics, and design, as well as the propagation of radio waves. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

U- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 3	2		Maxwell equations. Continue equation. Maxwell Equations for Time Varying Fields. Boundary Conditions. Time Varying Potentials. Heuristic Approach. Retarded Potentials. Maxwell Equation Approach. Helmholtz Theorem. Solution of The Wave Equation. Poynting Vector.	Lecture	Daily Exams + Discussion + Monthly Exams
4 – 6	2		Antenna Definition. Properties of Antenna. Types of Antenna. Block Diagram of Communication Systems. The Isotropic. The Ideal Dipole. Radiation Mechanism.	Lecture	Daily Exams + Discussion + Monthly Exams
7 – 11	2		Antenna Parameters. Radiation Pattern. Field Regions. Radian And Steradian. Radiation Intensity. Directivity. Power Gain. Radiation Efficiency. Effective Length. Effective Area. Front To Back Ratio. Antenna Bandwidth. Antennas In Communication(Friis Formula). Antennas in Radar System. Antenna Polarization. Polarization Mismatch. Reciprocity Theorem. Input Impedance of Antenna. Antenna Temperature.	Lecture	Daily Exams + Discussion + Monthly Exams
12 – 15	2		Thin Linear Antenna. Short Dipole. Monopole. Dipole Antenna. Small Loop Antenna. Plot of Radiation Pattern. Image Theory.	Lecture	Daily Exams + Discussion + Monthly Exams
16 – 19	2		Antenna Arrays. Linear Array. Pattern Multiplication. Two Element Array. Uniform Array. End Fire Array. Broad Side Array. Non Uniform Array. Binomial Array. Chebychev Array Synthesis. Planer Array.	Lecture	Daily Exams + Discussion + Monthly Exams
20 - 24	2		Special Antenna. Aperture Antenna. Folded Dipole Antenna.	Lecture	Daily Exams + Discussion

			Yagi-Uda Antenna. Helical antenna. Biconical antenna. Spiral antenna. Microstrip patch antenna.		+ Monthly Exams
25 – 27	2		Antenna Measurements. Antenna Measurement Range. Radiation Pattern Measurement. Gain and Directivity Measurement. Polarization Measurement. Input Impedance and Input Reflection Measurement.	Lecture	Daily Exams + Discussion + Monthly Exams
28 – 30	2		Radio Wave Propagation. Ground Wave. Free Space Propagation. Ground Reflection. Surface Waves. Diffraction. Wave Propagation in Complex Environment. Troposphere Propagation. Troposphere Scatter. Ionosphere Propagation.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Antenna theory and design" 2. "Antenna system engineering"
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Communication Systems/2
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	60 hours Theoretical and 90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student learns about the main aspects of digital communication systems in terms of how to generate and embed a digital signal, send and receive it, and discover and correct errors. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

V- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 6	5		Pulse Code Modulation (PCM); Quantization process; Representation of binary data; Noise consideration in PCM system; S/N performance of PCM; Limitations and modifications of PCM; Delta modulation; Delta-Sigma modulation; Adaptive delta modulation; Differential PCM (DPCM); Inter-Symbol Interference (ISI); Pulse shaping to reduce ISI; Equalization; Equalizer types; Matching filter	Lecture	Daily Exams + Discussion + Monthly Exams
7 – 13	5		Digital Modulation Amplitude Shift Keying (ASK); Frequency Shift Keying (FSK); Phase Shift Keying (PSK); Coherent and noncoherent detection; Differential PSK (DPSK); Error performance of binary systems; Quadrature Amplitude Modulation (QAM); Quadrature Phase Shift Keying (QPSK); Offset-QPSK (OQPSK); Minimum Shift Keying (MSK); Multilevel modulation techniques (MFSK, M-ary PSK & M-ary QAM); Error performance of M-ary systems; Comparison between performance of digital modulation types; Band width efficiency; Power spectra of modulated signals; Carrier recovery & clock recovery.	Lecture	Daily Exams + Discussion + Monthly Exams
14 – 22	5		Channel coding: Error detecting codes; Error correcting codes; systematic and nonsystematic codes, hamming distance, hamming weight; linear block codes; Hamming Bound, Hamming code; Encoding of linear block codes ; Decoding of linear block codes;	Lecture	Daily Exams + Discussion + Monthly Exams

			cyclic codes; nonsystematic cyclic codes; systematic cyclic codes; Encoding with an (nk) stage shift register; Encoding with a k-stage shift register; Syndrome calculation and Error detection; convolution codes; decoding of convolution codes (Viterbi algorithm).		
23 – 30	5		Spectrum System Spread Types of spread spectrum systems; frequency hopping, time hopping, chirp, & hybrid; Linear code generation; Synchronization of spread spectrum systems; acquisition SSS & tracking SSS; Application of SSS.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Introduction to communication systems" 2. "Digital communication systems"
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Digital Signal Processing
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	90 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student learns to understand the mathematical analysis of signals and how to process them. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

W-Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 6	3		Continuous and discrete signals and systems	Lecture	Daily Exams + Discussion + Monthly Exams
7 – 11	3		Convolution	Lecture	Daily Exams + Discussion + Monthly Exams
12 – 14	3		Fourier analysis continuous signals and system	Lecture	Daily Exams + Discussion + Monthly Exams
15 – 17	3		Discrete Fourier transform(DFT), Fast Fourier transform (FFT)	Lecture	Daily Exams + Discussion + Monthly Exams
18 – 22	3		The Laplace transform and the z-transform, solution of difference equations	Lecture	Daily Exams + Discussion + Monthly Exams
23 – 24	3		Feedback system	Lecture	Daily Exams + Discussion + Monthly Exams
25 – 30	3		Signal processing, filtering	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- "Fundamental of digital signal processing", Lonnie C. Ludeman 2- "Digital signal processing", S. Salivahanan.
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Design of Electronic circuits
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	60 hours Theoretical and 90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The course aims to analyze electronic circuits related to electrical power, as well as design and manufacture various electronic circuits. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

X- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	5		Power electronics systems: introduction, history of power electronics, power electronics semiconductor device, power electronics converter, advantage and disadvantage, power electronics module, computer simulation of power electronics circuit.	Lecture	Daily Exams + Discussion + Monthly Exams
2 – 3	5		Power semiconductor diode and transistor: basic structure of power diode, I-V characteristics of power diode, reverse recovery, power diode types (general purpose, fast switching and schottky diodes), effect of forward and reverse recovery time of diode, series and parallel connection of diodes, diodes and rectifier circuit (half wave and full wave).	Lecture	Daily Exams + Discussion + Monthly Exams
4 – 5	5		Power transistor: bipolar junction transistor, power MOSFET, PMOSFET characteristics, application, comparison MOSFET and BJT, insulated Gate BJT, IGBT structure, equivalent circuit, operation, application.	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 11	5		Thyristor principle and application: basic structure of thyristor, I-V characteristics, two transistor model of thyristor, turn-ON and turn-OFF characteristics, thyristor gate characteristics, thyristor protection circuit, di/dt protection circuit, dv/dt protection circuit, snubber circuit design, gate protection circuit, heating, cooling and mounting of thyristor, gate triggering circuit, pulse transformer, photocoupler circuit, thyristor commutation circuit, natural commutation, forced commutation,	Lecture	Daily Exams + Discussion + Monthly Exams

			load side, resonant pulse, complementary, impulse, external pulse, line side commutation circuit, series and parallel connection of thyristor, thyristor types, phase controlled, fast switching, gate turn-OFF, bidirectional switch, reverse conduction, static induction, light activated , FETcontrolled, MOSFET- controlled and other thyristor family, programmable unijunction transistor (PUT), silicon unilateral switch (SUS), comparison between thyristor and transistor.		
12 – 15	5		Controlled rectifier: controlled technique, principle of phase controlled rectifier, single phase half wave rectifier (resistive and resistive-inductive)load, single phase half wave rectifier (resistive and resistive-inductive)load with freewheeling diode, single phase full wave rectifier (resistive and resistive-inductive)load, single phase full wave rectifier (resistive and resistive-inductive)load with freewheeling diode.	Lecture	Daily Exams + Discussion + Monthly Exams
15 – 16	5		Inverter: introduction to inverter and application, classification of inverters, voltage source inverters, current source inverters, square wave inverters, quasi square inverter, pulse modulation inverters, thyristor in inverters, single phase half bridge inverters, (resistive and resistive-inductive load), single phase full bridge inverters (resistive, resistive-inductive) load, , performance parameter of inverters.	Lecture	Daily Exams + Discussion + Monthly Exams
17 – 18	5		Choppers: introduction to chopper, basic classification of chopper, basic operation, thyristor chopper circuit, performance parameter.	Lecture	Daily Exams + Discussion + Monthly Exams
19	5		Voltage controller: introduction to voltage controller, principle of ON-OFF control, principle of phase	Lecture	Daily Exams + Discussion + Monthly

			control, single phase bidirectional controller with resistive load, single phase controller with resistive-inductive load.		Exams
20 – 22	5		Charge transport in semiconductor: drift current, hall effect, current density equation, scattering mobility of carrier, effect of electric field on mobility, temperature effect on mobility, effect of doping on mobility, conductivity equations, diffusion phenomena, diffusion length, diffusion in solids, Einstein's relation, points defects.	Lecture	Daily Exams + Discussion + Monthly Exams
23 – 25	5		Integrated circuit fabrication and technology: grown junction, alloy junction, planar technology, thin film, thick film, IC processing main concepts, IC processing main steps, clean room, purification stage, crystal growth, czochralski method, ingot slicing to wafer, wafer etching and polishing, inspection, batch processing, oxidation, lithography, photoresist, masking, etching, doping, metallization, wafer slicing to chips, die mounting, wire bonding, hermetic sealing.	Lecture	Daily Exams + Discussion + Monthly Exams
26 – 27	5		Epitaxy and oxidation: types of Epitaxy, techniques, methods, vapour phase Epitaxy, liquid phase Epitaxy, molecular beam Epitaxy, oxidation process, application, pre-oxidation, pre-cleaning, thermal growth.	Lecture	Daily Exams + Discussion + Monthly Exams
28	5		Fundamental of LSI and VLSI, introduction, consideration of IC processing, MEM's, direct device design (resistor, inductor, capacitor, diodes, transistors, assembly techniques of packing VLSI application.	Lecture	Daily Exams + Discussion + Monthly Exams
29	5		CAD, electronic design automation, advantage of CAD, hardware design methodology, FPGA/PLD, design of FPGA/PLD, ASIC	Lecture	Daily Exams + Discussion + Monthly Exams

30	5	Integrated circuit and some device application, IC types, method of use, advantage, MOS IC, advantage, applications of programmable logic device, GAL, PLDS, CUPL application, nano-material technology, application of nano-technology	Lecture	Daily Exams + Discussion + Monthly Exams
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12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Power Electronic, Design, Circuit and application", by Mohammad
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Maintenance of communication Systems/1
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	60 hours Theoretical and 120 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student acquires the skill of how to maintain the computer with all its parts and accessories. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

Y- Knowledge and Understanding

- A1. The ability to apply knowledge in mathematics and engineering sciences.
- A2. Ability to identify, formulate and solve engineering problems.
- A3. Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	6		Computer System Overview, Computer Case [models, Form factor(AT, ATX), Booting Sequence, POST	Lecture	Daily Exams + Discussion + Monthly Exams
2	6		Power Supply (Architecture, Voltages, Color Codes, Form factors, Connectors, Linear PS, Switched PS), Cooling System, Power Issues , Surge Protectors, SPS, UPS	Lecture	Daily Exams + Discussion + Monthly Exams
3	6		Motherboards(Form factors),Chipsets (northbrige,outhbridge) ,CPUs (Architecture,Speed, Busses, packaging, , Connectors)	Lecture	Daily Exams + Discussion + Monthly Exams
4	6		Bus Type (Data, Address, Control), Bus Architecture (ISA, EISA, VESA, PCI, MCA, PCMCIA, USB, AGP, PCI Exprees),	Lecture	Daily Exams + Discussion + Monthly Exams
5	6		I/O (RS-232, parallel, PS2, USB, firewire)	Lecture	Daily Exams + Discussion + Monthly Exams
6	6		RAM [SRAM (L1 Cache, L2 cache), DRAM (Standard, FPM, EDO, BEDO, SDRAM, RDRAM, DDR SDRAM)), Modules (SIMM, DIMM, RIMM), Parity vs. Non Parity	Lecture	Daily Exams + Discussion + Monthly Exams
7	6		CMOS; [CMOS Battery, CMOS setting (Date, Time, HDDs, FDDs, Memory, Booting Sequence, System resources, Power Management, Passwords, Virus Protection]	Lecture	Daily Exams + Discussion + Monthly Exams
8	6		ROM (EPROM, EEPROM, FlashROM) ,BIOS, Shadowing, Upgrading BIOS, Drivers, PNP	Lecture	Daily Exams + Discussion + Monthly Exams
9	6		System Recourses (IRQ , DMA, I/O, Memory Address)	Lecture	Daily Exams + Discussion + Monthly Exams

10	6		Floppy Disk (drive , media, Read/write Process), HDD (geometry, Media, Read/Write Process)	Lecture	Daily Exams + Discussion + Monthly Exams
11	6		CD (drive , media),CD-ROM, CD-R,CD-RW	Lecture	Daily Exams + Discussion + Monthly Exams
12	6		DVD (drive, media), DVD-R, DVD-RAM,DVDROM, DVD+R	Lecture	Daily Exams + Discussion + Monthly Exams
13 - 14	6		Drives Controllers(IDE , EIDE, Ultra, SCSI,SATA)	Lecture	Daily Exams + Discussion + Monthly Exams
15	6		HDD Partitioning, File Systems (FAT, FAT32, NTFS) , HDD Formatting (Low Level, High Level)	Lecture	Daily Exams + Discussion + Monthly Exams
16	6		Audio cards, Video Cards (VRAM, WRAM, RAMDAC),	Lecture	Daily Exams + Discussion + Monthly Exams
17	6		Monitors Overview and Important Concepts ; (Pixels, Dot Pitch, Screen Size, Aspect Ratio, Color Depth, Resolution , Sharpness, Viewability, Standards)	Lecture	Daily Exams + Discussion + Monthly Exams
18	6		Cathode Ray Tubes CRT, Architecture, Electron Gun, Aperture Grill, Analyzing Motion of Electrons)	Lecture	Daily Exams + Discussion + Monthly Exams
19 - 20	6		Liquid Crystal Displays LCD; Liquid Crystals (Twisted Nematics , Super Twisted Nematics), Light Sources (Transmissive, Transflective, Reflective) , Driving Method (Segment, Passive Matrix, Active Matrix)	Lecture	Daily Exams + Discussion + Monthly Exams
21- 22	6		Plasma Display Panels PDP; Architecture, DC vs. AC PDPs, Addressing (Matrix , Coplanar)	Lecture	Daily Exams + Discussion + Monthly Exams
23 - 24	6		Touch Screens; (Resistive, Surface Acoustic Wave, Capacitive, IR, Optical Imaging, Dispersive Signal Technology, Frustrated Total	Lecture	Daily Exams + Discussion + Monthly Exams

			Internal Reflection)		
25 - 26	6		Printers; (Thermal , Dot-Matrix, Inkjet, Laser),Scanners, Photocopiers	Lecture	Daily Exams + Discussion + Monthly Exams
27- 29	6		Operating Systems, Overview, DOS, Win98, Win ME, Win2000, Win XP, Linux	Lecture	Daily Exams + Discussion + Monthly Exams
30	6		Hardware and Software Troubleshooting,	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "PC Technology and applications by Iskandarani";
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Engineering Analysis
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	90 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student learns about Laplace transforms and complex integration, in addition to numerical analysis and their application in programs on the computer. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

Z- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 2	3		The Z-trans formation: region of convergence; properties of Ztransform; Z-transform pairs; the inverse of Z-trans former; analysis and discrete time system.	Lecture	Daily Exams + Discussion + Monthly Exams
3- 8	3		Laplace transformation:- definition of Laplace transform; Laplace transform of some elementary function; Inverse of Laplace transforms; Laplace transform of derivative and transformation of ordinary differential equations; partial fractions ;solution of differential equation by using Laplace transform; unit step function; ramp function ;impulse function.	Lecture	Daily Exams + Discussion + Monthly Exams
9	3		Partial differential equations:- basic concepts; separation of variables; D'Alembert's solution of wave equation.	Lecture	Daily Exams + Discussion + Monthly Exams
10 – 12	3		Complex analytic functions:- complex function; limit; derivative; analytic function; cauch-Rieman equations; Laplace's equation; rational function; root.	Lecture	Daily Exams + Discussion + Monthly Exams
13 -14	3		Complex Integrals:- Line integral in the complex plane; basic properties of the complex line integral; Cuachy's integral formula; the derivatives of an analytic function.	Lecture	Daily Exams + Discussion + Monthly Exams
15	3		Special functions:- Gamma function; Beta function	Lecture	Daily Exams + Discussion + Monthly Exams
16 – 20	3		Numerical method in linear algebra:- solution of system linear equations; Gauss and Gauss-Gordon method; solution by iteration (Jacobi's and Gauss-siedal) method; matrix inversion (elimination method)	Lecture	Daily Exams + Discussion + Monthly Exams
21 – 25	3		Solution of nonlinear equation:- fixed point, bisection method,	Lecture	Daily Exams + Discussion

			false position method; Newton method; secant method; Newton-Raphson method.		+ Monthly Exams
26 – 27	3		Numerical integration:- trapezoidal method; Simpson method	Lecture	Daily Exams + Discussion + Monthly Exams
28 – 30	3		Numerical solution of ordinary differential equations(ODE):- initial value problem for first order ODE; Taylor's series least square; Euler and modified Euler; Runge-kutta; predictor corrector method; initial value problem for 2'nd order ODE; finite difference; ,trapezoidal rule and Runge-kutta Nystrom method.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Advance Engineering Mathematics", Kreysis 2. "Advanced mathematics for engineers and scientists" by Murray R. Spiegel
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Computer Application/3
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 3
7. Number of hours tuition (total)	30 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student learns the basics and applications of (Autocad) and (Matlab), as it is one of the important applications. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

AA- Knowledge and Understanding

- A1. The ability to apply knowledge in mathematics and engineering sciences.
- A2. Ability to identify, formulate and solve engineering problems.
- A3. Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
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D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		التعرف على بيئة عمل البرنامج و المكونات المختلفة لشاشة Autocad (scroll bars, toolbars, properties bar)	Lecture	Daily Exams + Discussion + Monthly Exams
2	3		اعداد ورقة الرسم, فتح ملف جديد, حدود الرسم (Limit), وحدات الرسم (unit), الشبكة (grid), القفز (snap), الخزن (save) (as , save	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 5	3		التعرف على اوامر الرسم المختلفة Point , line , arc , circle , pline , multiline ,etc	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 8	3		التعرف على اوامر التعديل Move , copy , offset , mirror , editing.....etc	Lecture	Daily Exams + Discussion + Monthly Exams
9	3		الرسم الدقيق (Osnap)	Lecture	Daily Exams + Discussion + Monthly Exams
10	3		اضافة الابعاد (Dimension)	Lecture	Daily Exams + Discussion + Monthly Exams
11	3		اضافة النصوص (Text), القطاعات (Hatch)	Lecture	Daily Exams + Discussion + Monthly Exams
12	3		التحكم بمواصفات الرسم layer, properties, linetypes	Lecture	Daily Exams + Discussion + Monthly Exams
13 – 14	3		الكتل و التوصيفات block & attributes Block, wblock, explode, divide, measure	Lecture	Daily Exams + Discussion + Monthly Exams
15 – 16	3		مدخل الى الرسم ثلاثي الابعاد ucs, vports, elev, thickness	Lecture	Daily Exams + Discussion + Monthly Exams
17 – 18	3		انشاء سطوح ثلاثية الابعاد 3D surfaces	Lecture	Daily Exams + Discussion + Monthly Exams
19 – 20	3		انشاء اجسام ثلاثية الابعاد 3D solids	Lecture	Daily Exams

					+ Discussion + Monthly Exams
21	3		نظام البرمجة بتطبيق MATLAB : مقدمة عن اهمية التطبيق MATLAB في التخصصات الهندسية وانواع الملفات التي يتضمنها العمل واسلوب التشغيل	Lecture	Daily Exams + Discussion + Monthly Exams
22	3		انواع النوافذ في تطبيق MATLAB, نافذة الوامر command window مع توضيح لاهم الايعازات : file, edit, view, window نافذة Editor/debugged window مع توضيح لأيعازات debug, tools, file edit, view	Lecture	Daily Exams + Discussion + Monthly Exams
23	3		اسلوب كتابة البرنامج بتطبيق MATLAB مع بعض الامثلة عن التعبيرات الرياضية, ايعازات الادخال input وايعازات الاخراج fprintf, display	Lecture	Daily Exams + Discussion + Monthly Exams
24	3		ايعازات السيطرة, if.....else....endif_H_select case حلقات التكرار for-next,dowhile.....end	Lecture	Daily Exams + Discussion + Monthly Exams
25	3		ايعازات الحجز Dimention () , array () vector, matrices للمتجهات اسلوب قراءة المتجهات ذات البعد الواحد والبعدين	Lecture	Daily Exams + Discussion + Monthly Exams
26	3		المعالجات الرياضية على المصفوفات ومنها, determent, inverse, transpose, multiplication , eigen value, eigen vector حل بعض النماذج الهندسية والرياضية (التحليلات الهندسية) بلأعتماد على المعالجات السابقة. الدوال الجاهزة (function) في الرياضيات و التخصصات الاخرى.	Lecture	Daily Exams + Discussion + Monthly Exams
27	3		اسلوب طبع البيانات في نافذة command واسلوب خزنها في الملف. الرسوم البيانية من خلال الاعتماد على two- dim plots من خلال plot, gtext	Lecture	Daily Exams + Discussion + Monthly Exams
28	3		الرسوم ثلاثية الابعاد three-dim plots من خلال ايعازات mesh, plot3, mishgrid() الرسوم ذات الحالة contour من خلال دوال surfz(), meshc, counter(), pcolor	Lecture	Daily Exams + Discussion + Monthly Exams
29	3		الطرق العددية في التفاضل و التكامل من خلال الاعتماد على دوال MATLAB	Lecture	Daily Exams + Discussion + Monthly Exams

30	3	نافذة التعامل مع ملفات من نوع figure file (fig) واهم الاوامر والايكونات الرئيسية الموجودة فيه. نافذة النمذج Simulink library وعملية اضافة نموذج الى شاشة العمل.	Lecture	Daily Exams + Discussion + Monthly Exams
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12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Essential Matlab for Scientists and Engineering" by Brian
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Communication Systems/3
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	60 hours Theoretical and 90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student learns about satellite systems and their transmitting and receiving stations. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

BB-Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 2	5		<p>INTRODUCTION: The birth of satellite communications, Satellite com. services, Satellite com. system, The organization of a satellite communications system (Space segment, Earth segment), Types of orbits (Elliptical orbits, Circular Low Earth Orbits (LEO), Circular Medium Earth Orbits(MEO), Geostationary Obits (GO)), The altitude of satellite in GO</p>	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 13	5		<p>LINK ANALYSIS: The characteristic parameters of an antenna (gain, the angular beam width), The power emitted in a given direction (Effective isotropic radiated power (EIRP), power flux density), Received signal power (power received by the receiving antenna, The practical case, Carrier –tonoise ratio at the receiver input, Noise temperature at the receiver input, Noise temperature of the receiver TR., The antenna noise temperature, Satellite antenna(clear sky and with rain), earth station antenna(clear sky and with rain), Example 1: Uplink (clear sky), Example 2: Downlink (clear sky), Example 3: Up link (with rain), Signal-to-noise ratio for a station-to-station link (single access), Repeater model, Expression for $(C/NO)_T$, Example [calculation the repeater gain at saturation $(G_{sat})_{SL}$, the $(C/NO)_{U,sat}$, $(C/NO)_{D,sat}$, and $(C/NO)_{T,sat}$, the IBO, OBO, $(C/NO)_U$, and $(C/NO)_D$ for $(C/NO)_T = 80\text{dB}$, the $(C/NO)_T$ under the rain causing an attenuation of (6dB) on the up-link.</p>	Lecture	Daily Exams + Discussion + Monthly Exams

14 – 20	5		TRANSMISSION TECHNIQUES: Signal characteristics, End-to-end communication link, Performance objectives, Availability objectives, Propagation time.	Lecture	Daily Exams + Discussion + Monthly Exams
21 – 25	5		MULTIPLE ACCESSES: Traffic laws, The principle of multiple access, Frequency division multiple access (FDMA), Time division multiple access (TDMA), Code division access (CDMA)	Lecture	Daily Exams + Discussion + Monthly Exams
26 – 30	5		MULTIBEAM SATELLITE NETWORKS: Advantage and disadvantages of multibeam satellites, Intersatellite link (ISL) Frequency bands, Radio-frequency links, Optical links.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	<ol style="list-style-type: none"> "Satellite communication systems" "Introduction to Sattelite communications"
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> College library to obtain additional resources for the curriculum. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Security of communication
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • The student is introduced to communications security techniques and encryption systems. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

CC-Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction to communication security: security trends; security attacks; security mechanisms.	Lecture	Daily Exams + Discussion + Monthly Exams
2	2		Modular arithmetic.	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 5	2		Classical encryption techniques: symmetric cipher model; substitution techniques (Caesar cipher, monoalphabetic cipher; Playfair cipher, Hill cipher, polyalphabetic ciphers, and one-time pad); transposition techniques (rail fence technique, columnar technique, double columnar technique).	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 8	2		Block cipher and data encryption standard (DES): block cipher principles (Feistel cipher, Feistel cipher structure, Feistel decryption algorithm); DES encryption; DES decryption; differential and linear cryptanalysis; block cipher design principles.	Lecture	Daily Exams + Discussion + Monthly Exams
9 – 11	2		Advanced encryption standard (AES): substitution bytes transformation; ShiftRow transformation; MixColumns transformation; AddRoundKey transformation; Equivalent inverse cipher.	Lecture	Daily Exams + Discussion + Monthly Exams
12	2		Multiple encryption: double DES; triple DES with two keys; triple DES with three keys.	Lecture	Daily Exams + Discussion + Monthly Exams
13	2		Block cipher modes of operation: electronic codebook mode; cipher block chaining mode; cipher feedback mode; output feedback mode; counter mode.	Lecture	Daily Exams + Discussion + Monthly Exams
14	2		Stream ciphers and RC4: stream cipher structure; RC4 algorithm.	Lecture	Daily Exams + Discussion + Monthly Exams

					Exams
15	2		Public-key cryptography: Public-key cryptosystem; Public-key cryptanalysis.	Lecture	Daily Exams + Discussion + Monthly Exams
16 – 17	2		RSA algorithm: description of the algorithm; computational aspects; RSA security.	Lecture	Daily Exams + Discussion + Monthly Exams
18 – 19	2		Diffie-Hellman key exchange; Elliptic curve arithmetic; Elliptic curve cryptography	Lecture	Daily Exams + Discussion + Monthly Exams
20 – 21	2		Message authentication: authentication functions (message encryption, message authentication code, Hash function); message authentication codes; Hash functions; security of Hash functions.	Lecture	Daily Exams + Discussion + Monthly Exams
22 – 24	2		Hash and MAC algorithms: secure Hash algorithm (SHA-512 Logic, and SHA-512 Round function); Whirlpool (whirlpool Hash structure, block cipher W, and performance of whirlpool); HMAC (HMAC design objectives, HMAC algorithm, and security of HMAC)	Lecture	Daily Exams + Discussion + Monthly Exams
25 – 26	2		Digital signatures and authentication protocols: digital signatures; digital signature standard; authentication protocols	Lecture	Daily Exams + Discussion + Monthly Exams
27 – 30	2		Security applications on computer networks: E-mail security; IP security; web security.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- "Cryptography and network security" 2- "Cryptography with coding theory"
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Communication and Computer networks
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	60 hours Theoretical and 90 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introduce the student to computer networks, their various types, as well as the systems and protocols that are used. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

DD- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	5		Networks; overview and important concepts: Network categories (PAN, LAN, MAN, WAN, GAN), Circuit switching vs. Packet switching, Baseband vs. Broadband transmission, Transmission modes (simplex, half duplex, full duplex), Segments and backbones, Peer to Peer vs. Client/Server Networks, Protocols (elements, functions), Transfer Rate (Digital BW, Throughput, Goodput)	Lecture	Daily Exams + Discussion + Monthly Exams
2 – 3	5		Networking Models: OSI reference model (Layer1: Physical Layer, Layer2: Data-link Layer, Layer3: Network Layer, Layer4: Transport Layer, Layer5: Session Layer, Layer6: Presentation Layer, Layer7: Application Layer), TCP/IP model (Network access layer, Internet layer, Transport layer, Application layer)	Lecture	Daily Exams + Discussion + Monthly Exams
4	5		Physical Layer: Mediums [Copper (Coaxial cable, Twisted Pair Cables), Fiber Optics (multimode, singlemode), Wireless (RF, Microwaves, satellites, IR, FSO)], Networking topologies (Bus, Ring, Dual Ring, Star, Extended Star, Mesh, Wireless), Physical vs. logical topologies	Lecture	Daily Exams + Discussion + Monthly Exams
5	5		Physical Layer (continued): Noise (Cross talk, thermal, AC power noise, reference ground noise, EMI/RFI), Losses (Copper medium losses, Fiber optics losses), Timing issues (Dispersion, Jitter, Latency), Coding [Liner coding (NRZL, NRZI, Manchester, Differential Manchester, MLT3), Block coding (4B/5B, 8B, 10B)], Layer1 Devices (Repeaters, Hubs)	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 7	5		Data-link layer protocols: Ethernet (IEEE 802.3) [Regular Ethernet (mediums, topologies, encoding), Fast Ethernet	Lecture	Daily Exams + Discussion + Monthly Exams

			(mediums, topologies, encoding), Gigabit Ethernet (mediums, topologies, encoding), 10Gigabit Ethernet (mediums, topologies, encoding), frame format ,Data-link Sublayers (MAC, LLC), CRC, MAC addresses (unicast, multicast, broadcast), MAC mechanism (CSMA/CD)]		
8	5		Data-link layer protocols (continued):Token Ring(IEEE 802.5) [Physical layer specifications (mediums, speeds, topologies, encoding), Frame types and Formats(Data Frame, Token Frame, Command Frame, Abort Delimiter Frame), Priority and reservation, MAC mechanism (Token passing)]	Lecture	Daily Exams + Discussion + Monthly Exams
9	5		Data-link layer protocols (continued):Fiber Distributed Data Interface FDDI [Physical layer specifications(mediums, speeds, topologies, encoding), Frame types and Formats(Data Frame, Token Frame, Station management Frame), MAC mechanism (Early Token Release)]	Lecture	Daily Exams + Discussion + Monthly Exams
10 – 11	5		Data-link layer protocols (continued):WiFi (IEEE 802.11) [Physical layer specifications(topologies, FHSS, DSSS, OFDM, architecture, speeds), Versions (legacy, IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n), Frames Formats, MAC mechanism (CSMA/CA)], Bluetooth (IEEE 802.15) (architecture, format, layers)	Lecture	Daily Exams + Discussion + Monthly Exams
12	5		Layer2 Devices :NIC , Ethernet Bridge (collision domains, broadcast domains, transparent bridging), Ethernet Switches, Access point.	Lecture	Daily Exams + Discussion + Monthly Exams
13 – 15	5		Network Layer: IPv4 [Datagram format, fragmentation, classfull addressing (subnetting, supernetting), classless addressing]	Lecture	Daily Exams + Discussion + Monthly Exams
16	5		Network Layer (continued): IPv6 (datagram format, addressing	Lecture	Daily Exams + Discussion

			extension headers, tunneling)		+ Monthly Exams
17	5		Network Layer (continued): ICMP(messages, format, error reporting, queuing), IGMP (group management, messages, format, error reporting), ICMPv6(messages, format, error reporting)	Lecture	Daily Exams + Discussion + Monthly Exams
18	5		Network Layer (continued): ARP, DNS (Name Space, Resolution, Messages), NAT	Lecture	Daily Exams + Discussion + Monthly Exams
19 – 20	5		Network Layer (continued): Routing [routing tables, static routing, Dynamic routing, unicast routing, multicast routing, Protocols (RIP, OSPF, BGP)]	Lecture	Daily Exams + Discussion + Monthly Exams
21 – 23	5		Transport Layer: UDP (format, port numbers, sockets), TCP (format, port numbers, connection establishment and connection termination, flow control, error control, congestion control), SCTP (format, flow control, error control, congestion control) QoS (Flow characteristics, flow classes)	Lecture	Daily Exams + Discussion + Monthly Exams
24 – 26	5		TCP/IP application layer protocols: e-mail (SMTP, POP3), file transferring (FTP), web (HTTP, HTML, XML), VoIP (RTCP, SIP, H323), Management (SNMP)	Lecture	Daily Exams + Discussion + Monthly Exams
27 – 28	5		Security: Encryption ,Viruses , Hacking, Firewalls, VPNs, IPsec, SSL, WEP, WAP	Lecture	Daily Exams + Discussion + Monthly Exams
29 – 30	2		WAN: Protocols (PPP, PDN), Systems (ATM, SONET , ISDN, DSL)	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Data communications and networking", 4 th edition, Behrouz and Foronzan 2. "TCP/IP protocol suite", 3 rd edition, Foronzan.
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Modern communication Systems
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	60 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introducing students to optical communication systems and networks and their characteristics, as well as wireless communication systems and microwave systems 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

EE- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4		Overview of optical communication systems : definition of OCS, advantages and disadvantages, spectrum, history of OCS, related topics, elements of OCS.	Lecture	Daily Exams + Discussion + Monthly Exams
2	4		Review of optics: light theories, Reflection and refraction of plane waves; snell law ,Interference, Diffraction, Optical coherence , Polarization of light. Total internal reflection , critical angle, acceptance angle, numerical aperture.	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 4	4		Characteristics of optical fibers: Construction of optical fiber, step index OF, grades index, single mode and multimode OF, number of mode , normalized frequency, plastic and glass OF, propagation of light in OF, attenuation, absorption and scattering, dispersion,	Lecture	Daily Exams + Discussion + Monthly Exams
5 – 6	4		Optical sources and transmitters: Physics of light emission and amplification in semiconductors, Light-emitting diodes, SLED, ELED, Semiconductor lasers, lasing operation. Modulation techniques. Optical transmitters	Lecture	Daily Exams + Discussion + Monthly Exams
7 – 8	4		Optical detectors and receivers: Photoconductors, avalanche photodiode, PIN diode , Photodiodes, Phototransistors, Optical receivers, performance and operation, amplification and detection.	Lecture	Daily Exams + Discussion + Monthly Exams
9	4		Optical amplifier, EDFA, Repeater	Lecture	Daily Exams + Discussion + Monthly Exams
10 – 11	4		Wavelength division multiplexing WDM, DWDM, CWDM, add-drop facility.	Lecture	Daily Exams + Discussion + Monthly Exams

12 – 13	4		Optical telecommunication network, input and output port, network topologies.	Lecture	Daily Exams + Discussion + Monthly Exams
14 – 15	4		SDH and SONET, Hierarchy of multiplexing, frame structure, functional components.	Lecture	Daily Exams + Discussion + Monthly Exams
16	4		Overview of wireless communication system, type of wireless systems, generations of wireless communication system.	Lecture	Daily Exams + Discussion + Monthly Exams
17 – 18	4		Introduction to cellular system, frequency reuse, channel assignment strategies, handoff strategies, system capacity	Lecture	Daily Exams + Discussion + Monthly Exams
10 – 21	4		Mobile communication system, GSM , CDMA 2000, UMTS, WCDMA, handoff management ,	Lecture	Daily Exams + Discussion + Monthly Exams
22 – 24	4		Wireless network, limitation of wireless network, GSM network hierarchy, signaling and traffic.	Lecture	Daily Exams + Discussion + Monthly Exams
25	4		Introduction to microwave communication system, microwave spectrum, advantages and applications of microwave system.	Lecture	Daily Exams + Discussion + Monthly Exams
26	4		Waveguide, WG characteristics, circular and rectangular WG,	Lecture	Daily Exams + Discussion + Monthly Exams
27 – 28	4		Microwave components and semiconductors, microwave cavities, directional coupler, hybrid circuit. Circulators and isolator	Lecture	Daily Exams + Discussion + Monthly Exams
29 – 30	4		Microwave telecommunication system architecture of the networks, RADAR system	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "Optical fiber communication", John M. Senior 2. "wireless communication and networking", William Stalling
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Maintenance of Communication Systems/2
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	60 hours Theoretical and 120 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • The student acquires a skill in how to maintain and operate communications equipment 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

FF- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	6		Element of electrical circuit.	Lecture	Daily Exams + Discussion + Monthly Exams
2	6		Characteristics and usage of Thyristor, TRIAC and DIAC.	Lecture	Daily Exams + Discussion + Monthly Exams
3	6		General packet radio system	Lecture	Daily Exams + Discussion + Monthly Exams
4	6		Normal telephone	Lecture	Daily Exams + Discussion + Monthly Exams
5 – 6	6		Telegraph, closed circuit working, Differential duplex circuit, Telegraph distortion.	Lecture	Daily Exams + Discussion + Monthly Exams
7 – 9	6		Global Positioning System(GPS), Segments of GPS, how GPS determines apposition, sources of errors, using a GPS receiver.	Lecture	Daily Exams + Discussion + Monthly Exams
10 – 12	6		External telephone network, primary telephone network, secondary telephone network, cabinets, distribution box unit, cable capacities.	Lecture	Daily Exams + Discussion + Monthly Exams
13 – 16	6		Block diagram of telephone exchange, switching unit, control unit, interface unit, main distribution frame.	Lecture	Daily Exams + Discussion + Monthly Exams
17	6		Global system for mobile network (GSM), history of GSM, generation of GSM.	Lecture	Daily Exams + Discussion + Monthly Exams
18 - 26	6		Architecture of the GSM network: mobile station(me, sim card, IMEI, IMSI), base station subsystem (base transceiver station, base station controller), Kind of cellular cells (marco cell, micro cell, Umbrella cell, selective cell, cluster cell, pico	Lecture	Daily Exams + Discussion + Monthly Exams

			cell), Transcoder (XCDR), Network switching subsystem (mobile switching center, gate mobile switching center, home location register, visitor location register, equipment identity register, authentication center,		
27	6		Handover	Lecture	Daily Exams + Discussion + Monthly Exams
28	6		Frequency reuse	Lecture	Daily Exams + Discussion + Monthly Exams
29	6		Construction of mobile equipment	Lecture	Daily Exams + Discussion + Monthly Exams
30	6		Infrared, Bluetooth	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "GSM networks: Protocol, Terminology and Implementation", Gunnar Heine
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Control
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	60 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introduce the student to system performance, response to it, system stability, and how to control them for optimal performance. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

GG- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 2	4		Introduction to control system, definitions, historical background, mathematical background, general natural of engineering control problem, basic elements of control system, type of control system, closed loop, open loop, time variant, time invariant system, linear, non-linear system.	Lecture	Daily Exams + Discussion + Monthly Exams
3 – 5	4		Mathematical model of dynamic system: mathematical model of writing differential equation, electrical circuit components, resistance, capacitance, inductance, analogy of electrical system, mathematical model of mechanical system, translation system, mass, spring, dashpot, rotational system, analogy of mechanical system. Transfer function, how to determine the transfer function, advantage, disadvantage, properties of transfer function, multivariable of transfer function.	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 7	4		Block diagram: definition of basic block elements, procedure of drawing block diagram, block diagram reduction algebra, Mason's formula	Lecture	Daily Exams + Discussion + Monthly Exams
8 – 10	4		Time response analysis: transient and steady-state region of response, standard test signals, how to determine order of system from transfer, first order system, second order system, time response specification, example of first order and second order, higher order system response.	Lecture	Daily Exams + Discussion + Monthly Exams
11 – 12	4		Steady-state error response: type of control system, how to determine order from transfer function; position velocity and acceleration error constant, method of dynamic error constant.	Lecture	Daily Exams + Discussion + Monthly Exams

13 – 14	4		System stability: Routh-Hurwitz criteria, poles and zeros definition, relation between system parameter and poles location.	Lecture	Daily Exams + Discussion + Monthly Exams
15 – 18	4		Root-locus analysis	Lecture	Daily Exams + Discussion + Monthly Exams
19 – 23	4		Frequency response analysis: advantage and disadvantage of frequency analysis, time concept of frequency response, plotting of frequency response, frequency response specification, phase margin, gain margin, bode plot phase margin and gain margin of bode plot.	Lecture	Daily Exams + Discussion + Monthly Exams
24 - 26	4		Nyquist stability analysis	Lecture	Daily Exams + Discussion + Monthly Exams
27 - 30	4		Design of control system from frequency response, lead compensator, lag compensator, lead-lag compensator.	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	<ol style="list-style-type: none"> 1. "Modern control engineering"; 5th edition, Katsuhiko Ogata 2. "Linear control system analysis and design with matlab"; 5th edition, John J. D'Azzo and Constantine H. Houpis.
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions

Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Computer Application/4
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	30 hours Theoretical and 60 hours Practical
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> The student will be introduced to the basics and applications of (Power Point) and (C++), as it is one of the important applications. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

HH- Knowledge and Understanding

- A1. The ability to apply knowledge in mathematics and engineering sciences.
- A2. Ability to identify, formulate and solve engineering problems.
- A3. Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 – 15	3		<p>برنامج Power point : مفهوم البرنامج وفوائده, تشغيله, مكونات الشاشة الرئيسية, مفهوم العروض (presentation) وفوائدها.</p> <ul style="list-style-type: none"> • بناء عرض حقيقي جديد من خلال القوالب التي يوفرها البرنامج او التعامل بشكل مباشر, خزن العرض التقديمي, اجراء العرض, اجراء التعديل وحفظ التغييرات. • التخطيط الى بناء العرض التقديمي, ادخال شريحة جديدة (slide) سواء كان فيها نص (text) او صورة (graphics/), ادخال الملاحظات , ادخال العناوين الرئيسية. • (headers) او (footers) للشريحة • تعلم كيفية اضافة الرسوم (drawing) من خلال ادوات الرسم المتوفرة, تعديل النص والتحكم بهيئته, تصفيفه و تغير خطه, التحكم بالالوان والارضية الخاصة بالشريحة. • اضافة (clip art) وطرق التحكم بها كالتكبير والتصغير او التقطيع, اضافة الصور الطبيعية وادوات التحكم بها, اضافة المخططات من برنامج (Excel), او صفحة بيانات من قواعد بيانات (access) • التعامل مع اوامر العرض المختلفة كالتوقيت (timings), الانتقال بين شريحة واخرى واساليبها, واساليب الحركة (animation) ووضع المؤثرات الصوتية للشرائح. 	Lecture	Daily Exams + Discussion + Monthly Exams
16 - 30	3		لغة C++	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Programming with visual C and C++, by Edward Hward
Special requirements (include for example workshops, periodicals, IT software, websites)	1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

1. Teaching Institution	Al-Farahidi University
2. University Department/Centre	Communication Technical Engineering
3. Course title/code	Industrial Management
4. Programme(s) to which it contributes	Bachelor of Communication Engineering Techniques
5. Modes of Attendance offered	Weekly attendance
6. Semester/Year	Year 4
7. Number of hours tuition (total)	60 hours (Theory)
8. Date of production/revision of this specification	11/10/2021
9. Aims of the Course	
<ul style="list-style-type: none"> • Introduce the student to the techniques of industrial project management in terms of studying the feasibility of projects and considerations of efficiency in the use of production requirements and how to reach a solution to problems. 	

10. Learning Outcomes, Teaching ,Learning and Assessment Method

II- Knowledge and Understanding

- A1.The ability to apply knowledge in mathematics and engineering sciences.
- A2.Ability to identify, formulate and solve engineering problems.
- A3.Teaching leadership skills and the value and quality of commitment, ethical behavior and respect for others.
- A4. Enable the student to visualize in project management and solve the problems encountered.
- A5.

B. Subject-specific skills

- B1. Ability to design and implement experiments
- B2. Ability to implement and maintain systems
- B3. The ability to use modern engineering methods, tools and skills necessary for engineering work
- B4. Ability to design using the latest design and simulation software

C. Thinking Skills

- C1. To show the student an interest in engineering problems and designs in communications and computer systems and the possibility of finding solutions
- C2. Thinking and discussion for the development of engineering designs and systems in the field of specialization
- C3. Forming groups of students to solve engineering problems in the field of specialization
- C4. The use of brainstorming to bring out the creative ideas of some gifted students

Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiments related to the outputs of thinking and analysis.
- Forming discussion panels during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics.
- Giving students homework and periodic reports.

Assessment methods

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students.
- Setting grades for homework and reports assigned to them.
- Quarterly exams for the syllabus in addition to the mid-year exam and the final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication and information technology skills and develop strategies.

D2. Ability to work as part of a team.

D3. Possess language skills (proficiency in speaking, writing and understanding Arabic and English) in the art of listening and the art of persuasion and dialogue.

D4. Possess leadership qualities, memory power, intuitive speed, intuition, predictability and stability.

D5. Perform literature searching and scientific report writing.

D6. Use of graphing and presentation packages and project planning.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		مفاهيم اساسية في الموارد وادارة الانتاج	Lecture	Daily Exams + Discussion + Monthly Exams
2 – 3	2		التكاليف و الايرادات	Lecture	Daily Exams + Discussion + Monthly Exams
4	2		تقنية ادارة الارباح وتحليل التعادل	Lecture	Daily Exams + Discussion + Monthly Exams
5	2		امثلة حول ادارة الارباح وتحليل التعادل	Lecture	Daily Exams + Discussion + Monthly Exams
6 – 7	2		الطاقات الانتاجية (امثلة حول الاستغلال الامثل للطاقات)	Lecture	Daily Exams + Discussion + Monthly Exams
8	2		دراسات الجدوى الاقتصادية والفنية للمشاريع (المدخل والمفاهيم)	Lecture	Daily Exams + Discussion + Monthly Exams
9	2		مضامين دراسات الجدوى الاولية	Lecture	Daily Exams + Discussion + Monthly Exams
10	2		امثلة حول بعض معايير دراسات الجدوى الاقتصادية والفنية	Lecture	Daily Exams + Discussion + Monthly Exams
11	2		اختيار الموقع الصناعي (الاهمية والعوامل المؤثرة في الاختيار)	Lecture	Daily Exams + Discussion + Monthly Exams
12	2		امثلة حول استخدام الاساليب الكمية والنوعية في اختيار الموقع الصناعي	Lecture	Daily Exams + Discussion + Monthly Exams
13	2		تخطيط الوحدة الصناعية	Lecture	Daily Exams + Discussion + Monthly Exams
14	2		دراسة و الوقت والحركة في الوحدة الانتاجية	Lecture	Daily Exams + Discussion

					+ Monthly Exams
15 – 16	2		استخدام بحوث العمليات في الانتاج (تطبيق البرمجة الخطية لحل المشاكل)	Lecture	Daily Exams + Discussion + Monthly Exams
17 – 18	2		ادارة اعمال الصيانة (الصيانة الوقائية والصيانة العلاجية)	Lecture	Daily Exams + Discussion + Monthly Exams
19	2		امثلة حول احتساب تكاليف الصيانة	Lecture	Daily Exams + Discussion + Monthly Exams
20	2		الاحلال (امثلة حول احلال مكائن جديدة)	Lecture	Daily Exams + Discussion + Monthly Exams
21 – 22	2		ادارة الموارد (اقتصاديات ضبط الخزين – الكمية الاقتصادية للطلب)	Lecture	Daily Exams + Discussion + Monthly Exams
23	2		امثلة حول احتساب الكمية الاقتصادية للطلب وتكاليف الخزين	Lecture	Daily Exams + Discussion + Monthly Exams
24	2		السيطرة النوعية (مفاهيم في السيطرة النوعية – اهميتها و مراحلها)	Lecture	Daily Exams + Discussion + Monthly Exams
25	2		استخدام الاحصاء في السيطرة النوعية (بعض المقاييس الاحصائية واسلوب الفحص بالعينات)	Lecture	Daily Exams + Discussion + Monthly Exams
26	2		اقتصاديات السيطرة النوعية	Lecture	Daily Exams + Discussion + Monthly Exams
27	2		لوحات السيطرة النوعية (لوحات ضبط المتغيرات ولوحات ضبط الصفات المميزة)	Lecture	Daily Exams + Discussion + Monthly Exams
28 – 29	2		امثلة حول كيفية تصميم لوحات السيطرة	Lecture	Daily Exams + Discussion + Monthly Exams
30	2		النظرية الاحتمالية واستخدامها في السيطرة النوعية	Lecture	Daily Exams + Discussion + Monthly Exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	<ol style="list-style-type: none"> 1. College library to obtain additional resources for the curriculum. 2. View scientific websites to see recent developments in the material.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	The admission criteria in the college is linked to the regulations of the Ministry of Higher Education and Scientific Research, since admission is central.
Minimum number of students	75
Maximum number of students	75

TEMPLATE FOR TYPICAL SITE VISIT SCHEDULE

1. The typical site visit schedule is designed for two or three days. It includes pre-arranged meetings. The responsibility for arranging these meetings and fitting the template to the circumstances rests with the Universities Quality Assurance and University Performance departments
2. Site visits will normally commence at 09:00 on day 1. Start times of pre-arranged meetings are indicated. Pre-arranged meetings should not normally last more than one hour. The schedule should not completely fill all times with meetings, but leave space for additional activities by peer reviewers including preparing for meetings, updating notes and records and drafting paragraphs for the draft Programme Review report

Table (1)

Session	Time	Activity
Day 1		
1	09:00	Welcome and introductions; brief introduction to the review (purposes, intended outcomes, use of evidence and self-evaluation report) – Programme Team
2	09:30	Curriculum; discussion with faculty members
3	11:00	Meeting with a group of students
4	12:30	Efficiency: tour of resources
5	14:00	Review panel meeting: scrutiny of additional documentation including sample of students' assessed work
6	15:00	Efficiency: meeting with faculty members
7	16:00	Review panel meeting: review of the evidence and any gaps or matters to follow-up
8	17:00	Meeting with external stakeholders (sample of graduates, employers, other partners)
Day 2		
9	08:45	Review meeting with review chairperson, review coordinator, programme leader: summary of day 1 findings, addressing any gaps, adjust the schedule for day 2 if required
10	09:00	Academic standards: meeting with faculty members
11	10:30	Effectiveness of quality management and assurance: meeting with faculty members
12	12:00	Review panel meeting: review of evidence and any matters still to be addressed
13	14:00	Flexible time to pursue any matters arising
14	14:30	Review panel final meeting: decisions on outcomes and drafting oral feedback
15	16:30	Oral feedback by review chairperson to review coordinator and faculty members
	17:00	Close

TEMPLATE FOR THE FOLLOW-UP PROCESS AND REPORT, AND OUTLINE OF TYPICAL SITE VISIT SCHEDULE FOR FOLLOW-UP

TEMPLATE FOR FOLLOW-UP REPORT

Quality Assurance and Academic Accreditation Directorate / International Accreditation Department.

Institution:

Faculty:

Programme:

Follow-up Report

1. This report presents the findings of the follow-up visit, which took place on / /20___. This is part of the Universities Quality Assurance and University Performance departments arrangements to provide continuing support for the development of internal quality assurance processes and continuing improvement
2. The purposes of the follow-up review are to assess the progress made in the programme since the Programme Review report, and to provide further information and support for the continuing improvement of academic standards and quality of higher education in Iraq.
3. The evidence base used in this follow-up review and report includes:
 - a) Self-Evaluation Report for the programme together with supporting information
 - b) Improvement plan prepared and implemented since the Programme Review report
 - c) Programme Review Report
 - d) Higher Education Quality Review Report and institutional strategic plan (if any)
 - e) Additional evidence presented during the follow-up visit.
4. The overall conclusions reached as the outcome of the follow-up review are as follows:
 - a) The programme (give title) at (give name of institution) has/has not successfully implemented an improvement plan.
 - b) Good practice in the indicators demonstrated since the Programme Review site visit includes: (insert)
 - c) Matters of particular importance that should be addressed by the institution in its continuing improvement of the programme are: (insert and indicate if they are, or as yet are not, addressed by the improvement plan).

5. The detailed report is provided in Annexure A below.

Annexure A

Name of Institution _____

Date of initial Programme Review site visit _____

Date visited in follow-up _____

Date of follow-up report _____

Names of follow-up reviewers

Position/title

Signed

Part 1: The Internal Quality Assurance System in operation				
	Questions	Yes? (√)	Comment	Further action required?
1	Is the programme Self- Evaluation Report complete?			
2	Do the most recent self-evaluation reports indicate the extent to which the criteria in the Framework for Evaluation are met and/or are being addressed?			
3	Is there an improvement plan in place, informed by external and internal review?			
4	Are there any major gaps that appear not to be addressed?			
5	Is progress with the improvement plan monitored?			
6	Are there any major obstacles to the expected achievement of the improvement plan?			
7	What is the institution's estimate of the time needed to complete improvements to the programme?			
8	What is the reviewers' assessment of the time needed to complete improvements to the programme that would demonstrate the indicators?			

Part 2: Progress demonstrated with the indicators			
Indicators (refer to Framework of Evaluation)	Improvement plan points (comment on match with the Programme Review report's recommendations)	New information from follow-up site visit	Overall conclusion
<u>Curriculum</u> Aims and ILOs Syllabus (content) Progression year on year Teaching and Learning Student assessment			
<u>Efficiency</u> Profile of admitted students Human resources Physical resources Uses made of available resources Student support Ratios of graduation to admitted students			
<u>Academic Standards</u> Clearly articulated standards Use of appropriate benchmarks Achievement of graduates Standards of students' assessed work			
<u>Programme management and Assurance</u> Arrangements for programme management Policies and procedures applied Structured comments collected and used Staff development needs identified and addressed Improvement planning processes working			

CRITERIA FOR A SUCCESSFUL REVIEW AND EVALUATION OF THE PROCESS

CRITERIA FOR A SUCCESSFUL REVIEW

1. The criteria for a successful review that informs the arrangements for Programme Review and its evaluation are as follows:
 - i. The programme being reviewed is supported by existing or developing internal systems including specifications and review with a culture of self-evaluation and continuing improvement. These features of internal review provide a sound basis for the external review.
 - ii. The timing of the external review is appropriate.
 - iii. The profile of the visiting peer review panel matches in broad terms the profile of the academic activities in the institution.
 - iv. There is due attention to detail in planning and preparation, by -
 - a. The Quality Assurance and Academic Accreditation Directorate applies consistently its procedures for working with the institution and the reviewers and provides appropriate support for the external review as required
 - b. The review coordinator: ensures that the evidence base generated by internal review and reporting systems is available on time to the visiting peer reviewers, and any requirements for clarification and supplementary information are satisfied
 - c. The institution: provides a self-evaluation report for the programme to be externally reviewed
 - d. The peer reviewers: undertake their preparation for the visit including reading the advance documentation and preparing initial commentaries that inform the conduct of the visit
 - v. There is consistency in the application of the published review method and the protocols by all participants in a way that respects and supports the mission and philosophy of the overall process for continuing review and continuing improvement.
 - vi. Reviewers and representatives of the institution conduct an open dialogue throughout the review that shows mutual respect.
 - vii. The judgements reached by the reviewers are clear, based on the evidence available and systematically recorded.
 - viii. The review report is produced on time in line with the standard report structure and is confirmed by the institution to be factually accurate.
 - ix. The set of conclusions arising from the review are constructive, offering a fair and balanced view of the programme.
 - x. The institution is able to benefit from the external review by giving due reflection and consideration to the findings and preparing where appropriate a realistic improvement plan

EVALUATION

2. The Quality Assurance and Academic Accreditation Directorate wishes to establish and implement procedures for the systematic evaluation of all external Programme Reviews arranged by it. The institution, the review chairperson and the peer reviewers will all routinely be asked to evaluate each external review by completing a short questionnaire. The structured comments will be analysed by the Quality Assurance and Academic Accreditation Directorate and where necessary the Quality Assurance and Academic Accreditation Directorate will take action to follow-up any difficulties highlighted. In addition, the Quality Assurance and Academic Accreditation Directorate will collate the structured comments to compile regular summary reports indicating the main features of the review process in practice, including the overall levels of satisfaction expressed by the participants, together with examples of good practice and opportunities for continuing improvement.

GLOSSARY OF TERMS IN PROGRAMME RE-VIEW

DEFINITIONS OF TERMS USED IN THE PROGRAMME REVIEW HANDBOOK

Some of the terms used in the Handbook and/or used in internal and external review and reporting may have different meanings according to the context in which they are used. To remove possible ambiguities, the following working definitions of the terms are offered.

ADEMIC FIELDS/SUBJECT AREAS/DISCIPLINES

Academic fields categorise recognisable and coherent domains or the scope of study such as Mathematics, Medicine, Engineering and Philosophy. Fields that have a wide scope are often subdivided; for example, Humanities include subjects like History and Literature and Arts may include separate disciplines of Fine Arts and Photography. The curriculum of some programmes may combine academic fields, or may include different subjects and disciplines such as Mathematics in Engineering or Accountancy in Business Administration.

ACADEMIC STANDARDS

Specific standards decided by the institution, and informed by external reference points. They include the minimum or threshold level of knowledge and skills to be gained by the graduates from the programme, and can be used in evaluation and review.

ACCREDITATION

The recognition accorded by an agency or other organisation to either an education programme or to an institution to confirm that it can demonstrate that the programme(s) meet acceptable standards and that the institution has effective systems to ensure the quality and continuing improvement of its academic activities, according to published criteria.

ACTION OR IMPROVEMENT PLANS

Realistic plans for improvement derived from the consideration of available evidence and evaluations; they may be implemented for more than one year, but should be prepared and reviewed annually at each level of courses, programmes and the institution.

ADMITTED STUDENTS

Students registered on a programme, including those accepted holding prior credits for admission after year 1.

BENCHMARK/REFERENCE POINTS

Benchmark statements represent general expectations about the standards of achievement and general attributes to be expected of a graduate in a given academic field or subject. Reference standards may be external or internal. External reference points allow comparison of the academic standards and quality of a programme with equivalent programmes in Iraq and internationally. Internal reference points may be used to compare one academic field with another, or to identify trends over a given time period.

COMMUNITY

A defined segment of wider society served by the institution, as determined in its mission and bylaws. It may be defined geographically or in terms of the range of organizations, groups and individuals engaged in its activities.

COURSE AIMS

Overall course aims should be expressed as the outcomes to be achieved by students completing the course as significant and assessable qualities. They should contribute to the achievement of defined aims within one or more education programmes.

CURRICULUM OR (IN THE PLURAL) CURRICULA

The complete organised learning as designed and managed by an institution for an admitted student, determined by the intended learning outcomes (ILOs) and comprising the content, the arrangements for teaching and learning and assessments of students' achievements together with the access to the range of facilities available within the University and, by arrangement, outside it, including libraries, computers studies, social, sports, internships and field studies.

DIRECTED SELF-LEARNING/INDEPENDENT LEARNING

The active promotion of personal skills included in the curriculum that support the student and graduate to seek, assimilate and learn from a range of structured and unstructured experiences. Methods of promotion include e-learning, personal and autonomous learning and fieldwork, assignments, internships, and reflexive learning. Devices commonly used that support directed self-learning beyond formal teaching lectures include logbooks, self-assessment reports, interactive learning tools or the equivalent.

E-LEARNING

Electronic-based learning using information technology may be the primary or secondary element in material associated with a programme or a course. It may be stand-alone or integrated with other teaching and learning approaches. It may include self-determination of aims, ILOs and materials using self-selection and will usually include self-assessment. It generally increases the levels of autonomy in, and responsibility for, learning. Converting existing texts or lecture notes to a website or pre-recorded media alone is generally not considered to be e-learning.

EXTERNAL EVALUATOR/EVALUATION

An appointment to a specific programme, part of a programme or course(s) by the institution to establish an independent and external professional opinion on the academic standards set and achieved in the examinations for the award of the degree.

FRAMEWORK FOR EVALUATION

The framework for evaluation provides a standard structure for evaluation of programmes. It will form the basis for self-evaluation, the site visit by external peer reviewers and the Programme Review report. It is designed to operate in all academic fields and institutions, and to apply to internal and external reviews.

GENERAL PRECEPTS/BY-LAWS

Principles, by-laws and regulations, which the educational institution must have as part of the policies covering its operations.

HIGHER EDUCATION INSTITUTE (HEI)/INSTITUTION

A Faculty, College or University providing higher education programmes leading to a first university degree (B.Sc. or B.A.) or a higher degree.

INTENDED LEARNING OUTCOMES (ILOS)

The ILOs are the outcome-related definition of knowledge, understanding and skills which the institution intends for its programmes. They should be mission-related, capable of measurement (assessable) and reflect the use of external reference standards at appropriate level.

INTERNAL SYSTEM FOR QUALITY MANAGEMENT AND ASSURANCE

The system adopted by the institution to ensure that its education programmes and contributing elements meet specified needs and are continually reviewed and improved. An outcomes-related system of quality management involves precise specifications for quality from design to delivery; evaluation; the identification of good practice as well as of learning deficiencies and obstacles; performance follow-up; suggestions for development and enhancement; and the systematic review and development of processes for establishing effective policies, strategies and priorities to support continuing improvement.

JOB/LABOUR MARKET

The availability of professional, commercial, research-oriented or other fields of employment that a graduate is qualified to join upon graduation.

MISSION STATEMENT

A brief statement clearly identifying the educational institution's duty and its role in the development of the community; a mission statement may also offer brief supporting statements on the vision, values and strategic objectives of the institution.

PEER REVIEWER

A person who is professionally equal in calibre and with management and/or subject expertise to those delivering the provision, but not from the same institution and without any conflict of interest, who can contribute to the review of an education programme for internal and external quality assurance or for accreditation purposes.

PROGRAMME

For the purpose of Programme Review an education programme is defined as one which admits students who, on successful completion, receive an academic award.

PROGRAMME AIMS

The broad purposes for providing the programme which in turn guide the development and implementation of strategic objectives (to ensure that the aims are met) and ILOs (to ensure that the students work towards attaining the specified outcomes).

PROGRAMME REVIEW

Programme Review applies to all education programmes in all higher education institutions. Where the programme is studied in more than one institution, the whole programme is included in Programme Review. Programme Review in Iraq has three objectives:

- 1) To provide decision-makers (in the higher education institutions, Quality Assurance and Academic Accreditation Directorate , parents, students, and other stakeholders) with evidence-based judgements on the quality of learning programmes
- 2) To support the development of internal quality assurance processes with information on emerging good practice and challenges, evaluative comment and continuing improvement
- 3) To enhance the reputation of Iraq's higher education internationally.

QUALITY ASSURANCE

The institution has the means of assuring that for each education programme, academic standards are defined and achieved in line with equivalent national and international standards, that the quality of the curriculum and related infrastructure are appropriate and fulfil the expectations of the range of stakeholders, that its graduates represent the range of attributes specified and that the organisation is capable of sustained, continuing improvement.

REVIEW COORDINATOR

The nominee of an institution to coordinate a Programme Review to assist in the gathering and interpretation of information and to support the application of published methods of review.

REPORT

The regular reports prepared on the basis of Programme Reviews and evaluations of its education programme.

SELF-EVALUATION

n institution's process of evaluating a programme as part of Programme Review and within an internal system of quality management and assurance.

SITE VISIT

A scheduled visit by external peer reviewers as part of Programme Review. Normally the site visit will be for two or three days. A typical outline timetable is provided in Appendix(1).

SPECIFICATION

The detailed description of the aims, construction and intended outcomes of a programme, and any courses, specific facilities or resources that contribute to it. The specification provides information to design, manage, deliver and review the programme.

STAKEHOLDER

Those organisations, groups or individuals which have a legitimate interest in the educational activities of the institution both in respect of the quality and standards of the education and also in respect of the effectiveness of the systems and processes for assuring the quality. An effective strategic review process will include the key stakeholder groups. The precise range of stakeholder groups and their differentiated interests depend upon the mission of the institution, its range of educational activities and local circumstances. The range is usually defined by a scoping study. Examples of groups with a legitimate interest include current students, graduates, intending students and their parents or family, staff in the institution, the employing community, the relevant Government ministries, the sponsors and other funding organisations and, where appropriate, professional organisations or syndicates.

STRATEGIC OBJECTIVES/PLANS

A collection of institution-specific objectives that are derived from its mission and developed into a realistic plan based on evidence-based evaluations. Objectives concentrate on the means by which an institution seeks to deliver its mission. The plan sets out the matters to be addressed, timeframe, person responsible and estimate of costs, and is accompanied by an implementation plan with arrangements for monitoring the progress and evaluating impact.

STUDENTS' ASSESSMENT

A set of processes, including examinations and other activities conducted by the institution to measure the achievement of the intended learning outcomes of a programme and its courses. Assessments also provide the means by which students are ranked according to their achievement. Diagnostic assessment seeks to determine the existing range of knowledge and skills of a student with a view to constructing an appropriate curriculum. Formative assessment provides information on the student's performance and progress to support further learning, without necessarily counting a grade towards graduation. Summative assessment determines the final level of attainment of the student on the programme or at the end of a course that contributes credits to the programme.

STUDENTS' EVALUATIONS

The systematic gathering of students' opinions on the quality of their programme in a standardized structure together with the analysis and outcomes. Surveys using questionnaires are the most frequently used methods to collect opinions; other mechanisms include websites conferences, panels or focus groups, and representation on councils or other committees.

TEACHING AND LEARNING METHODS

The range of methods used by teachers to help students to achieve the ILOs for the course. Examples include: lectures, small group teaching such as tutorials, seminars and syndicate groups; a case study to teach students how to analyse information and reach a decision; assignments such as writing a review paper for the students to gain the skills of self-learning and presentation; field trips; practical sessions for the students to gain practical skills; and carrying out experiments to train the students to analyse the results, reach specific conclusions and prepare a report, presentation or poster.