

**Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department**



Academic Program and Course Description Guide

2024–2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Al-Nahrain University

Faculty/Institute: College of information Engineering

Scientific Department: Information and Communication Engineering
Department

Academic or Professional Program Name: Information and Communication
Engineering

Final Certificate Name: Bachelor of Science (B.Sc.) in Information and
communication Engineering

Academic System: Courses System

Description Preparation Date: 22/4/2025

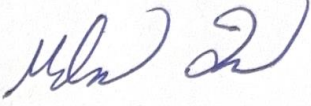
File Completion Date: 22/4/2025

Signature: 

Head of Department Name:

Asst. Prof. Dr. Hamsa A. Abdullah

Date: 2/6/2025


Signature: 
Scientific Associate Name:

Date: 2/6/2025



The file is checked by: Dr. Mohammed A. Jabbar Hamsa
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:

Date: 3/6/2025

Signature: 



Approval of the Dean

Prof. Dr. Hikmat N. Abdullah₄

Hikmat

3/6/2025

1. Program Vision

Excellence and leadership in the field of information and communications engineering.

2. Program Mission

Seeking to qualify graduate students to compete in the labor market with excellence by enriching them with the necessary knowledge and skills.

3. Program Objectives

- 1- Sustaining the academic program by continuously updating the curricula in line with employers and market needs.
- 2- Seeking academic accreditation for the academic program.
- 3- Promoting scientific research in the fields of information technology and sustainable development.
- 4- Strengthening cooperation and twinning mechanisms with peer departments.

4. Program Accreditation

Not Yet

5. Other external influences

Ministry of Higher Education & Scientific Research

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	16	9.09%	
College Requirements	8	33	18.75%	
Department Requirements	32	127	72.16%	
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
2024/2025 1 st year	ENGL100	English Language I	2	
	CALC101	Calculus I	3	
	PHYS102	Physics	2	2
	BIOL103	Biology	3	
	ENDR104	Engineering Drawing	2	2
	CFAP105	Computer Fund. & Prog. I	2	2
	ARAB150	Arabic Language	1	
	HURT151	Human Right	1	
	CALC152	Calculus II	3	
	CFAP153	Computer Fundamentals & Programming II	2	2
	DLDN154	Digital Logic Design	2	2
	CTAL155	Circuits Analysis	2	2
ELPH156	Electronic Physics	2	2	
2024/2025 2 nd year	ENGL200	English Language II	2	
	EGMM201	Engineering Mathematics I	3	
	PBST202	Probability and Statistics	3	
	ELEC203	Electronic	2	2
	OOPG204	Object Oriented Prog.	2	2
	DBSY205	Database Systems	2	2
	PRMG250	Principles of Management	2	
	EGMM256	Engineering Mathematics II	3	

	SGSY257	Signals and Systems	2	2
	DSDN258	Digital Systems Design	2	2
	CONT259	Computer Networks	2	2
	TLOF261	Transmission Lines and Optical Fibers	3	
2024/2025 3 rd year	DEMO300	Democracy	2	
	NUMD301	Numerical Methods	2	2
	COAR302	Computer Architecture	3	
	ITHC303	Inform. Theory & Comm.	2	2
	INPR305	Internet Programming	2	2
	DSPR306	Digital Signal Processing	2	2
	ENGL350	English Language III	2	
	IMPR351	Image Processing	2	2
	DMMA352	Disc. Math & Modern Algebra.	3	
	DTCO353	Digital Communications	2	2
	MICR354	Microprocessor	2	2
	CADC357	Coding and Data Compression	2	2
2024/2025 4 th year	PRET400	Professional Ethics	2	
	GPRO401	Graduation Project 1	1	2
	WLCO402	Wireless Communications	3	2
	CRYP403	Cryptography	2	2
	COEN405	Control Engineering	2	2
	OPSY406	Operating Systems	2	2
	ENGL450	English Language IV	2	
	GPRO451	Graduation Project 2	1	2
	DTMI456	Data Mining	3	0
	ARIT453	Artificial Intelligence	3	2
	MULT407	Multimedia	2	2
	INEN307	Internet Engineering	2	2

8. Expected learning outcomes of the program	
Knowledge	
A1	Employing the foundations of mathematics in the field of information and communication engineering.
A2	Introducing programming concepts, object-oriented programming, and operating systems.
A3	Apply engineering principles in defining, formulating and solving engineering problems.
A4	Analyzing and designing information systems, their applications, and data transmission
Skills	
B1	The ability to present, analyze and solve problems using scientific methods.
B2	The ability to use engineering principles and apply computational and programming methods to analyze information and communication systems in general.

B3	Use of effective communication means and skills and the ability to work as a group to activate the processes associated with the specialty.
B4	The ability to use methods and procedures in collecting and analyzing data and writing and submitting scientific reports.
Ethics	
C1	The ability to design and implement programs and applications appropriate to the needs of the beneficiary.
C2	The ability to be creative, innovative, solve problems, communicate scientific ideas, suggest solutions and provide advice.
C3	Ability to manage oral presentations, manage time, use information sources and work as part of a team.
C4	The ability to apply security procedures and professional and ethical methods in the field of information and communication engineering.

9. Teaching and Learning Strategies

Theoretical, tutorials and practical lectures, daily assignments, and discussions. In addition to uploading video lectures via the Internet using the Moodle system.

10. Evaluation methods

Daily, quarterly and final exams, daily tasks and assignment, discussions, laboratory reports, and graduation projects.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer

Professor	Electrical Engineering	Communication Engineering			1	
Professor	Electronic and Electronic Engineering	Electronic and communication Engineering			2	
Professor	Physic	Image processing			1	
Professor	Electrical and Communications Engineering	Communication and Multimedia			1	
Assistant Prof	Information Engineering	Information and communication Engineering			1	
Assistant Prof	Computer Engineering	Computer Eng. and Mobile networks			1	
Assistant Prof	Electronic and Electronic Engineering	Communication Engineering			1	
Assistant Prof	Electrical Engineering	Electronics and Communications Engineering			1	
Lecturer	Information Engineering	Information and communication Engineering			2	
Lecturer	Electronic and Electronic Engineering Technology	Computer Engineering			1	
Lecturer	Architecture Engineering	Sustainable Architecture			1	
Lecturer	Computer Communications Engineering	Wireless Communication Networks			1	

Lecturer	Electrical Engineering	Communication and Wireless Network			1	
Lecturer	Electronic and Electronic Engineering	Electronic and communication engineering			1	
Lecturer	Electronic and Electronic Engineering	Communication Engineering			1	
Assistant Lecture	Communication Engineering	Information and communication Engineering			1	
Assistant Lecture	Information and communication Engineering	Information and communication Engineering			1	
Assistant Lecture	Information Engineering	Information and communication Engineering			1	
Assistant Lecture	Information and Computer Systems	Information Technology			1	
Assistant Lecture	Computer Science and Communications	Information and Communications Technology			1	
Assistant Lecture	Control and System Engineering	Control and System Engineering			1	
Assistant Lecture	Computer Information Systems	Computer Science			1	
Assistant Lecture	hs	Engineering Project Management			1	
Assistant Lecture	Computer Technologies/Computer	Digital Image Processing			1	

	Network Communications					
Assistant Lecture	Information and communication Engineering	Wireless networks and communications			1	
Assistant Lecture	Network Engineering	Network Security			1	
Assistant Lecture	Communications Engineering	Wireless Communications Engineering			1	

Professional Development

Mentoring new faculty members

The College and the Department of Information and Communication Engineering are committed to fostering academic excellence and professional development through a structured faculty mentoring program. This process supports new, visiting, full-time, and part-time faculty members in their integration into the academic environment and in achieving teaching, research, and service excellence.

Institutional-Level Support:

Orientation Programs: New faculty attend university-wide orientations that introduce institutional policies, academic expectations, and available resources.

Professional Development Workshops: Faculty are encouraged to participate in regular training on teaching strategies, assessment practices, and academic integrity.

Department-Level Support:

Teaching Methods Course Support: The department requires new faculty to complete a certified Teaching Methods Course. Support includes:

- Registration assistance and scheduling flexibility.
- Study resources and access to sample materials.

Classroom Observation & Feedback: New faculty are given opportunities to observe experienced instructors and receive feedback on their own teaching.

Regular Reviews & Check-ins: Periodic meetings are conducted to assess progress, provide feedback, and address any challenges in teaching or research.

Professional development of faculty members

The Department of Information and Communication Engineering is committed to continuous academic and professional growth of its faculty members. The department, in collaboration with the institution, has established a structured development plan that focuses on enhancing teaching effectiveness, research capabilities, and engagement with the academic community.

1. Teaching and Learning Strategies:

Workshops and seminars are conducted on curriculum development, classroom management, and inclusive teaching practices.

2. Assessment of Learning Outcomes:

Faculty receive guidance on the design and implementation of effective assessment tools aligned with course learning outcomes.

Training is provided in the use of rubrics, formative and summative assessments, and data analysis for outcome-based education.

The department reviews course and program outcomes periodically to ensure alignment with national and international academic standards.

3. Professional Development Activities:

Faculty are encouraged to attend and present at national and international conferences, workshops, and seminars.

Support is provided for pursuing higher academic qualifications, certifications, and specialized training in emerging areas of information and communication engineering.

Internal and external grant opportunities are promoted to support faculty research and innovation projects.

12. Acceptance Criterion

Central admission

13. The most important sources of information about the program

<https://coie-nahrain.edu.iq/en/>

14. Program Development Plan

The Department of Information and Communication Engineering has recently transitioned from a traditional course system to the **Bologna Process (European Higher Education Area – EHEA)** framework. This strategic shift is part of a broader institutional effort to harmonize academic standards, enhance student mobility, and improve the quality of higher education.

Key Elements of the **Bologna–Based Program** Development Plan:

1. Curriculum Alignment with Bologna Standards:

- Programs are restructured into clear cycles (Bachelor’s) with defined learning outcomes and credit allocations based on the **European Credit Transfer and Accumulation System (ECTS)**.
- Courses are modularized to support interdisciplinary learning and flexibility in program pathways.
- Emphasis is placed on outcome–based education, student workload, and competency development.

2. Quality Assurance and Accreditation:

- The department adheres to internal and external quality assurance mechanisms in line with Bologna principles.
- Periodic reviews are conducted to ensure compliance with national and EHEA standards, with continuous improvement actions based on feedback from stakeholders.

3. Teaching and Assessment Methods:

- Student–centered teaching strategies are prioritized, including problem–based learning, flipped classrooms, and collaborative projects.
- Assessment methods are redesigned to evaluate competencies, including practical application, critical thinking, and soft skills.

4. Curriculum Development:

- Curriculum development teams include academic to ensure relevance and quality.

5. Mobility and Internationalization:

- Course structures are designed to facilitate academic mobility and credit recognition across EHEA institutions.

6. Graduate Employability and Industry Linkages:

- Enhanced focus on practical skills, internships, and final-year projects aligned with real-world applications.
- Industry advisory boards provide input to keep the curriculum aligned with current and future labor market needs.

This Bologna-aligned development plan strengthens the department's academic integrity, international compatibility, and commitment to producing globally competitive graduates in the field of Information and Communication Engineering.

Program Skills Outline

				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
2024/2025 1st year	ENGL100	English Language I											*	*	*	*
	CALC101	Calculus I		*												
	PHYS102	Physics						*								
	BIOL103	Biology						*								
	ENDR104	Engineering Drawing		*									*			
	CFAP105	Computer Fund. & Prog. I											*			
	ARAB150	Arabic Language			*				*					*		
	HURT151	Human Right									*	*	*	*	*	*
	CALC152	Calculus II		*												
	CFAP153	Computer Fundamentals & Programming II			*					*				*		
	DLDN154	Digital Logic Design		*			*									
	CTAL155	Circuits Analysis		*			*									

	ELPH156	Electronic Physics				*				*		*			
2024/2025 2nd year	ENGL200	English Language II									*		*	*	*
	EGMM201	Engineering Mathematics I			*			*					*		
	PBST202	Probability and Statistics		*											
	ELEC203	Electronic					*	*							*
	OOPG204	Object Oriented Prog.			*			*					*		
	DBSY205	Database Systems		*				*	*						
	PRMG250	Principles of Management		*			*						*		
	EGMM256	Engineering Mathematics II		*			*						*		
	SGSY257	Signals and Systems		*				*	*						
	DSDN258	Digital Systems Design		*				*	*						
CONT259	Computer Networks					*	*							*	

	TLOF261	Transmission Lines and Optical Fibers			*				*				*		
2024/2025 3 rd year	DEMO300	Democracy		*				*							
	NUMD301	Numerical Methods								*	*	*	*	*	*
	COAR302	Computer Architecture				*	*					*			
	ITHC303	Inform. Theory & Comm.			*				*				*		
	INPR305	Internet Programming			*				*				*		
	DSPR306	Digital Signal Processing		*			*	*							
	ENGL350	English Language III												*	*
	IMPR351	Image Processing			*	*				*		*	*		
	DMMA352	Disc. Math & Modern Algebra.			*			*				*	*		
	DTC0353	Digital Communications		*				*							
	MICR354	Microprocessor								*					

	CADC357	Coding and Data Compression					*	*							*
2024/2025 4th year	PRET400	Professional Ethics												*	*
	GPRO401	Graduation Project 1		*				*							
	WLCO402	Wireless Communications					*			*	*	*	*	*	*
	CRYP403	Cryptography		*			*	*					*		
	COEN405	Control Engineering			*		*	*							*
	OPSY406	Operating Systems		*			*	*							*
	ENGL450	English Language IV					*					*	*	*	*
	GPRO451	Graduation Project 2		*			*	*					*		
	DTMI456	Data Mining		*				*	*						
	ARIT453	Artificial Intelligence					*	*							*
	MULT407	Multimedia			*		*	*							*
	INEN307	Internet Engineering		*			*	*							*

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

First Year First semester

Course Description Form

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8. Course Objectives																																																																																																																																																													
Course Objectives	<ul style="list-style-type: none"> know students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary. To understand pronouns, questions and short answers, tenses (present, past and future), adjective, adverb, prepositions of place, punctuation marks and practicing writing. This module works towards enhancing students' English language competencies along with their technical or professional knowledge. Enhance students' communication skills in English can result in better job opportunities in the future 																																																																																																																																																												
9. Teaching and Learning Strategies																																																																																																																																																													
Strategy	<p>The main strategies that will be adopted in delivering this module are:</p> <ul style="list-style-type: none"> Allow students to actively participate in the learning process with class discussion and exercises that support the initiative. Use didactic questioning through questions to determine student understanding the material. 																																																																																																																																																												

- Writing an assignment and report that encourages students to clarify and organize their thinking and independently research and present on a topic.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	Introduction	Theoretical	
2	2	A1	The sentence: What is a sentence and what is not a sentence.	Theoretical	Quiz I
3	2	A1	Parts of a sentence :subject ;types of subjects	Theoretical	
4	2	A1	Parts of a sentence :verb ;types of verbs :verb to be – ordinary verbs –modal verbs	Theoretical	Test I
5	2	A1	types of verbs 2	Theoretical	
6	2	A1	Tenses: present v. past	Theoretical	Quiz II
7	2	A1	The first exam	Theoretical	
8	2	A1	Parts of a sentence, the complement	Theoretical	Test I
9	2	A1	Types of a sentence ;simple sentence	Theoretical	
10	2	A1	Types of a sentence; complex sentence	Theoretical	
11	2	A1	Compound sentences	Theoretical	
12	2	A1	Practicing writing	Theoretical	Report
13	2	A1	Practicing writing	Theoretical	
14	2	A1	Practicing writing	Theoretical	Seminar
15	2	A1	Practicing writing	Theoretical	

11. Course Evaluation

Quiz and Assignments:10
 Mid-terms Exam:30
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Keith Boecker, P. Charles Brown, Oxford English for Computing, Oxford University press. -Prentice Hall, Writing &Practice Communication in Action, Pearson, Prentice Hall.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Longmann Preparation Course of the TOEFL test .the paper test
Electronic References, Websites	http://www.english for every one.com

Course Description Form

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Course Objectives	<ul style="list-style-type: none"> To understand the concept of rate of change To Develop the derivative idea from rate of change To perform derivative to different functions To deal with integration basics 																																																																																																																																																																																																																																																																																														
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Strategy	<p>The main strategies that will be adopted in delivering this module are:</p> <ul style="list-style-type: none"> Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. Use didactic questioning through questions to determine student understanding of the material. Weekly lectures with tutorial session ensure better understanding Quizzes and exams to ensure student learning 																																																																																																																																																																																																																																																																																														
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	C1	The Rate of Change of Function I: Coordinates for the plane, Increments & distance, The slope of a straight line. Equations of a, straight line	Theoretical	
2	4	C2	The Rate of Change of Function II: Functions & graphs, Slopes of quadratic & cubic curves, The slope of the curves $y=f(x)$, Derivatives, Velocity & other rates of change	Theoretical	Quiz I
3	4	C3	The Rate of Change of Function III: Properties of limits, Infinity as a limit, Continuous functions.	Theoretical	
4	4	C4	Derivatives I: Formal differentiation. Polynomial functions & their derivatives. Products, power, & quotients.	Theoretical	Test I
5	4	C1	Derivatives II: Implicit differentiation & fractional powers. Tangent line approximation. The chain rule & parametric equations. A brief review of trigonometry. Angles between curves.	Theoretical	
6	4	C2	Derivatives III: Derivatives of trigonometric functions. Newton's method for approximating solutions of equations. Inverse functions & the Picard method.	Theoretical	Quiz II
7	4	C3	Applications of Derivatives I: Curves sketching. The sign of the first derivatives. Concavity & points. Asymptotes & symmetry. Maxima & minima. Theory. Maxima & minima. Problems	Theoretical	
8	4	C4	Applications of Derivatives II: Related rates. Rolle's theorem. The mean value theorem. Indeterminate forms & l'Hopital rules. Extending the Mean Value Theorem to Taylor's formula	Theoretical	Test I
9	4	C1	Integration I: Indefinite integrals. Applications. Determining constants of integration. Integrals of trigonometric functions.	Theoretical	

10	4	C2	Integration II: Definite integrals. The area under a curve. Calculating areas as limits. The fundamental theorems of integral calculus.	Theoretical	
11	4	C3	Integration III: Integration by substitution Differentials. Rules for approximating definite integrals.	Theoretical	
12	4	C4	Applications of Definite Integrals I: Area between two curves. Distance. Calculating volumes by slicing.	Theoretical	Assignments
13	4	C4	Applications of Definite Integrals II: Length of plane curve. Area of a surface of revolution. Average value of a function.	Theoretical	
14	4	C4	Applications of Definite Integrals II: Length of plane curve. Area of a surface of revolution. Average value of a function.	Theoretical	
15	4	C4	Applications of Definite Integrals II: Length of plane curve. Area of a surface of revolution. Average value of a function.	Theoretical	

11. Course Evaluation

Quiz and Assignments:10

Mid-terms Exam:30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Calculus & Analytic Geometry, Thomas & Finney, 11th 2011.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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Course Objectives	The Objectives of this Module is to provide the students the Mathematics and Physics of Vectors. Also, the Physics and Mathematics of the Oscillation Motion and Waves motion, including Electromagnetic waves and Sound Waves. Moreover, The Basic Concepts of Physical Optics, including the Physics and Mathematics of Interference and Diffraction. Finally, the physics of nature of light and interaction of wave with matter.																																																																																																																																																																																															
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1	3	B1	General Introduction	Theoretical	
2	3	B1	Vectors and scalars, Component of Vectors, Vector Arithmetic	Theoretical	Quiz I
3	3	B1	Oscillation Motion - Part 1 Simple Harmonic Motion, The Force Law for Simple Harmonic Motion	Theoretical	
4	3	B1	Oscillation Motion - Part 2 Energy in Simple Harmonic Motion, Pendulums, Damped Simple Harmonic Motion	Theoretical	Test I
5	3	B1	Waves motion: Types of waves, Transverse and Longitudinal waves, Wavelength and Frequency, The Speed of Traveling wave, The wave Equation, The Principle of Superposition For waves, Interference of waves	Theoretical	
6	3	B1	Wave Motion: Sound waves, The Speed of Sound, Traveling Sound Waves, Intensity and Sound level, The Doppler Effect, Supersonic Speed, Shock Waves	Theoretical	Quiz II
7	3	B1	Electromagnetic Waves: definition, traveling of electromagnetic waves, properties, speed electromagnetic waves, energy transport and pointing vectors, variation of intensity, radiation pressure	Theoretical	
8	3	B1	Electromagnetic Waves: polarization, reflection and refraction, chromatic dispersion, total internal reflection	Theoretical	Test I
9	3	B1	Electromagnetic Waves Interference	Theoretical	
10	3	B1	Electromagnetic Waves Diffraction	Theoretical	
11	3	B1	Electric Potential: Electric charges and electric fields, Conductors and Insulators, Coulomb's law, The Electric Field Due to a Point Charge, The Electric Field Due to a Charged Disk	Theoretical	
12	3	B1	Capacitance: Calculating the Capacitance, Capacitors in Parallel and in Series, Energy Stored in an Electric Field, Capacitor with a Dielectric, Dielectrics: An Atomic View	Theoretical	Assignments
13	3	B1	Current and Resistance: Direct current circuits: Electric Current, Current Density, Resistance and	Theoretical	

			Resistivity, Ohms Law, Power in Electric Circuits		
14	3	B1	General Introduction	Theoretical	Seminar
15	3	B1	Vectors and scalars, Component of Vectors, Vector Arithmetic	Theoretical	

11. Course Evaluation

Quiz and Assignments:10
 Mid-terms Exam:30
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fundamentals of Physics, By: David Halliday and Robert Resnick, 9 th edition, John Wiley & Sons, 2011
Main references (sources)	Physical Science, By: Bill W. Tillery, 9 th edition Copyright © 2012 by The McGraw-Hill Companies
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

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Course Objectives	1-To understand life, chemistry and water continued: biological molecules, 2-To recognize cells and membranes 3-To identify Energy, Enzymes and Biological reactions, cellular respiration, photosynthesis 4-To understand cell division: mitosis and miosis: Mendel, Genes and inheritance, genes, chromosomes and human genetics 5-To understand DNA structure, Replication and Organization. From DNA to protein Biotechnology and cell processes and transport (Passive and active)																																																																																																																																																																																
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	B1	Introduction to Biology concepts: Life, Chemistry and water	Theoretical	
2	3	B1	Life, Chemistry and water continued: Biological Molecules	Theoretical	Quiz I
3	3	B1	Biological Molecules: Cells and Membranes	Theoretical	
4	3	B1	Cells and Membranes: Energy, Enzymes and Biological reactions	Theoretical	Test I
5	3	B1	Energy, Enzymes and Biological reactions continued	Theoretical	
6	3	B1	Cellular respiration	Theoretical	Quiz II
7	3	B1	Photosynthesis	Theoretical	
8	3	B1	Cell division: Mitosis and Miosis: Mendel, Genes and inheritance	Theoretical	Test I
9	3	B1	Cell division: Mitosis and Miosis: Mendel, Genes and inheritance	Theoretical	
10	3	B1	Genes, chromosomes and Human Genetics	Theoretical	
11	3	B1	DNA structure, Replication and Organization	Theoretical	
12	3	B1	From DNA to protein Biotechnology	Theoretical	Assignments
13	3	B1	Cell processes I- Transport (Passive and active)	Theoretical	
14	3	B1	Cell processes II- Metabolism (metabolic pathways & enzymes)	Theoretical	Seminar
15	3	B1	Cell processes III-Cellular respiration	Theoretical	

11. Course Evaluation

Quiz and Assignments:10

Mid-terms Exam:30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any) **Peter J. Russell, [Paul E. Hertz](#), [Beverly McMillan](#) , “Biology: The Dynamic Science”, Cengage Learning Publisher, 2nd Edition 2011**

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

Course Description Form

1. Course Name:

Engineering Drawing

2. Course Code:

ENDR104

3. Semester / Year:

1 semester / 1st year

4. Description Preparation Date:

22/4/2025

5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل (٢٠٢٤/٢٠٢٥ المرحلة) ()													رقم الاسبوع ()		
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													اسم الطالب		

6. Number of Credit Hours (Total) / Number of Units (Total):

5/3

7. Course administrator's name (mention all, if more than one name)

Name: Lecturer Dr. Marwa Mutaz

Email:

8. Course Objectives

Course Objectives	<p>The course should enable the student to:</p> <p>Generally, students are expected to gain understanding of the importance of engineering drawing as well as some drawing skills that help them in their discipline. Specifically, the course aims to give students the basic knowledge on the following topics:</p> <ol style="list-style-type: none"> 1. Drawing importance from an engineering perspective. 2. Drawing tools and line types. 3. Using AutoCAD by: <ol style="list-style-type: none"> 1) Drawing basic drawing elements. 2) Modifying drafts using different specific tools. 3) Drafting in 2D and 3D. <p>Analyzing drafts to address isometric views.</p>
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9. Teaching and Learning Strategies

Strategy	<p>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 program specification.</p> <ol style="list-style-type: none"> 1. Mainly "Whiteboard Based Lecturing"
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2. Oral Presentation
Drawing Application = CAD

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A1,C1	Basic Principles of Engineering Drawings: (Explanation of engineering tools, lines styles & types & Shapes drawing)	Theoretical, Lab	Lab
2	5	A1,C1	Explanation of engineering tools, lines styles & types & Shapes drawing	Theoretical, Lab	Quiz I, Lab
3	5	A1,C1	Engineering Operations: Dimensioning, Scale, Explanation of (Arch, Circle, Ellipse) drawings	Theoretical, Lab	Lab
4	5	A1,C1	Exercises on Engineering Operations	Theoretical, Lab	Test I, Lab
5	5	A1,C1	Projections: Multiview projections (Top projection, Front projection & Side Projection)	Theoretical, Lab	Lab
6	5	A1,C1	Exercises on Projections	Theoretical, Lab	Quiz II, Lab
7	5	A1,C1	Introduction to AutoCAD: History, Setting the Workspace, Keyboard Input, Working with Files, Displaying Objects., Creating Basic Drawings: Commands Using Object Snaps, Using Polar Tracking and Polar Snap, Using Object Snap Tracking, Working with Units, Using Function Key	Theoretical, Lab	Lab
8	5	A1,C1	Manipulating Objects: Object Selection Commands (copy, mirror, rotate, array) , Modifying Tools: Trimming and Extending Objects, Offsetting Objects, Joining Objects, Break Objects, Stretching Objects	Theoretical, Lab	Test I, Lab
9	5	A1,C1	Layer Management & Inquiry: Using Layers, Layer Tools, , organizing Objects with Layers, Using Inquiry Commands, Working with Layouts & Viewpoints: Using Layouts, creating layouts, Using Viewports, Plotting Drawings	Theoretical, Lab	Lab

10	5	A1,C1	Annotating the Drawing: Creating Multiline Text, Creating Single Line Text, Using & editing Text Styles, Dimensioning: Creating Dimensions, Using Dimension Styles, Editing Dimensions	Theoretical, Lab	Lab
11	5	A1,C1	Annotating the Drawing: Creating Multiline Text, Creating Single Line Text, Using & editing Text Styles, Dimensioning: Creating Dimensions, Using Dimension Styles, Editing Dimensions	Theoretical, Lab	Lab
12	5	A1,C1	Hatching Objects: Hatching Objects, Editing Hatch Objects, Working with Reusable Content: Using Blocks, Working with Design Center, Using Tool Palettes, Creating Additional Drawing Objects: Tables	Theoretical, Lab	Assignments, Lab
13	5	A1,C1	Hatching Objects: Hatching Objects, Editing Hatch Objects, Working with Reusable Content: Using Blocks, Working with Design Center, Using Tool Palettes, Creating Additional Drawing Objects: Tables	Theoretical, Lab	Lab
14	5	A1,C1	Basic Principles of Engineering Drawings: (Explanation of engineering tools, lines styles & types & Shapes drawing)	Theoretical, Lab	Lab
15	5	A1,C1	Basic Principles of Engineering Drawings: (Explanation of engineering tools, lines styles & types & Shapes drawing)	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6
 Lab: 14
 Mid-terms Exam:20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	كتاب الرسم الهندسي (عبد الرسول الخفاف) Technical Drawing 101 with AutoCAD 2017
Main references (sources)	<ul style="list-style-type: none"> Learn about AUTOCAD: An introduction to AutoCAD.

Recommended books and references (scientific journals, reports...)	• ميكانيكا انتاج الرسم باستخدام الحاسب
Electronic References, Websites	

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. To learn and understand computer system work. 2. To learn computer organization and architecture for computer. 3. To understand input and output devices. 4. To learn and understand storage devices. 5. To learn hardware and software computer system. 6. To learn computer number systems and data representations. 7. To understand computer network and the web technologies. 																																																																																																																		
9. Teaching and Learning Strategies																																																																																																																			
Strategy	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in lecture discussions and lab sessions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>																																																																																																																		
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method																																																																																																														

1	4	C1	Introduction to Computers: Characteristics of Computers, Components of a computer, Types of Computers, Computer System Hardware	Theoretical, Lab	Lab
2	4	C1	Computer Organization and Architecture: Central Processing Unit (CPU), Computer Memory, System bus, Motherboard, Expansion Slots, Built-in Components, External Connectors, Power Supplies, Ports and Interfaces	Theoretical, Lab	Quiz I, Lab
3	4	C1	Input and Output Devices, Storage Devices	Theoretical, Lab	Lab
4	4	C1	Computer Software: System software, Operating System, Types of Operating Systems, Functions of an Operating System, Windows Operating System, application software	Theoretical, Lab	Test I, Lab
5	4	C1	Introduction to Computer languages: Program development life cycle	Theoretical, Lab	Lab
6	4	C1	Computer number systems and data representation: Binary, Octal and Hexadecimal number systems, Binary Coded Decimals (BCD), Binary Coded Octal (BCO), Binary Coded Hexadecimals (BCH), 1's complement, 2's complement, conversion from one number system to another	Theoretical, Lab	Quiz II, Lab
7	4	C1	Program Design: Algorithms, Flowchart	Theoretical, Lab	Lab
8	4	C1	Windows Applications: Notepad, WordPad, Paint	Theoretical, Lab	Test I, Lab
9	4	C1	Introduction to C++ Programming: Variable types,	Theoretical, Lab	Lab
10	4	C1	Introduction to C++ Programming: Arithmetic expression	Theoretical, Lab	Lab
11	4	C1	Boolean expression, reading & writing variables	Theoretical, Lab	Lab
12	4	C1	Control statement: if statement & Switch statement	Theoretical, Lab	Assignments

13	4	C1	Repetition: For loop statement	Theoretical, Lab	Lab
14	4	C1	Repetition: While ... statement	Theoretical, Lab	Lab
15	4	C1	Repetition: Do ... while statement	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6

Lab: 14

Mid-terms Exam:20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	- S. M. Freund, et al, Discovering Computers and Microsoft Office 2016: A Fundamental Combined Approach, Cengage Learning, 2017 -
Main references (sources)	P. Deitel & H. Deitel, C++ How to Program, 10th Edition, Pearson, 2017
Recommended books and references (scientific journals, reports...)	- D.S. Malik, C++ Programming: From Problem Analysis to Program Design, 8 th Ed. 2017
Electronic References, Websites	

First Year

Second semester

Course Description Form

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Course Objectives	<p>إكتساب الطالب مهارة معرفية عن المفاهيم اللغوية . صون اللسان من الوقوع في الخطأ في نطق الكلمة . تنمية قدرات الطالب التعبيرية . تعليم الطلبة على تحليل منظومة الكلام . تعليم الطلبة على التمييز بين أصول الكلمة أو الزيادة وما تؤديه في زيادة المعنى . تعليم الطلبة على أساليب وقواعد ضبط المفردات وصياغتها . تمكين الطالب على استعمال المفردات اللغوية بالموقع السليم . تقديم تدريبات لتقوية ملكة الطالب وتنمية مقدرته في الممارسة اللغوية والبلاغة المؤثره مع الافادة من الخبرات والتدريبات . تمكين الطلبة من قراءة وتحليل النصوص الادبية وفهمها والقدرة على حفظها . تعليم الطلبة القراءة الصحيحة لآيات القرآن الكريم ومعرفة معانيه وتنمية قدرة الطلبة على الحفظ والنطق السليم</p>																																																																																																																																																																									
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Strategy	1- تقديم المحاضرة بشكل منسق ووفقا للوقت المحدد. 2- إعطاء الطلبة واجبات صفية وتكليفهم بتقديمها على المنصة. 3- إعطاء نسبة من الدرجة للانشطة المقدمة من قبل الطلبة.																																																																																																																																																																									
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	A2,B2,C2	المبتدأ وانواعه ، الخبر وانواعه، نواسخ الابتداء ، كان واخواتها، ان واخواتها الجملة الاسمية	Theoretical	
2	1	A2,B2,C2	المتنى والملحق به، جمع المنكر السالم والملحق به	Theoretical	Quiz I
3	1	A2,B2,C2	جمع المؤنث السالم، الاسماء الخمسة	Theoretical	
4	1	A2,B2,C2	الجملة الفعلية بناء الفعل الماضي، بناء فعل الامر	Theoretical	Test I
5	1	A2,B2,C2	الفعل المضارع، بناؤه واعرابه،	Theoretical	
6	1	A2,B2,C2	الاسماء المنصوبه، المفعول به، المفعول المطلق، المفعول فيه، المفعول معه	Theoretical	Quiz II
7	1	A2,B2,C2	معاني حروف الجر	Theoretical	
8	1	A2,B2,C2	محمد مهدي الجواهري	Theoretical	Test I
9	1	A2,B2,C2	الشعر: معروف الرصافي	Theoretical	
10	1	A2,B2,C2	القرآن الكريم سورة الحجرات	Theoretical	
11	1	A2,B2,C2	كتابة الهمزة المتوسطة والمتطرفة	Theoretical	
12	1	A2,B2,C2	كتابة الضاد والطاء، كتابة التاء القصيرة والطويلة	Theoretical	Assignments
13	1	A2,B2,C2	علامات الترقيم	Theoretical	
14	1	A2,B2,C2	الاطفاء الشائعة في المكاتبات الرسمية ، كتابة العدد	Theoretical	Seminar
15	1	A2,B2,C2	الشعر : احمد مطر	Theoretical	
11. Course Evaluation					
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			المصدر: محاضرات في اللغة العربية		
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Course Description Form

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Course Objectives	<p>حقوق الانسان ومبادئ وقيم هذه الحقوق وضمانتها من الانتهاك على كافة الصعد ومن ثم ما هو مستقبل هذه الحقوق في ظل التطور والتقدم التكنولوجي وتجليات العولمة وخلق ثقافة تساعد على تنمية حقوق الانسان للجميع والدفاع عنها حيث ان هذه الحقوق منذ ان ولد الانسان ولدت معه حقوقه.</p> <p>وكذلك مادة الديمقراطية من المواد الهامة والضرورية للطلبة حيث ان الطالب يحتاج الى المام بثقافة الديمقراطية ومعرفة العلمية لما في ذلك من اهمية كبيرة في فهم تطورها عبر العصور ومفهومها واشكالها وسبل ممارستها ، كما ان دراسة الديمقراطية دراسة علمية سيسهم في ارساء دولة القانون التي تعتمد الديمقراطية اساسا وركيزة لبنائها.</p>																																																																																																																																																																										
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method																																																																																																																																																																						
1	1	B4, C1, C2,C3,	حقوق الانسان في الحضارات القديمة	Theoretical																																																																																																																																																																							

2	1	B4, C1, C2,C3,	حقوق الانسان في الشرائع والاديان السماوية/ حقوق الانسان في الديانتين المسيحية واليهودية	Theoretical	Quiz I
3	1	B4, C1, C2,C3,	حقوق الانسان في الاسلام	Theoretical	
4	1	B4, C1, C2,C3,	مصادر حقوق الانسان/ المصادر الدولية	Theoretical	Test I
5	1	B4, C1, C2,C3,	المصادر الوطنية	Theoretical	
6	1	B4, C1, C2,C3,	ضمانات حقوق الانسان / ضمانات حقوق الانسان على الصعيد الداخلي	Theoretical	Quiz II
7	1	B4, C1, C2,C3,	=	Theoretical	
8	1	B4, C1, C2,C3,	ضمانات حقوق الانسان على الصعيد الدولي	Theoretical	Test I
9	1	B4, C1, C2,C3,	=	Theoretical	
10	1	B4, C1, C2,C3,	العولمة وحقوق الانسان	Theoretical	
11	1	B4, C1, C2,C3,	=	Theoretical	
12	1	B4, C1, C2,C3,	واجبات الحاكم الاسلامي	Theoretical	Assignments
13	1	B4, C1, C2,C3,	=	Theoretical	
14	1	B4, C1, C2,C3,	جرائم الابادة الجماعية	Theoretical	Seminar
15	1	B4, C1, C2,C3,	السيرة النبوية الشريفة	Theoretical	

11. Course Evaluation

Quiz and Assignments:10

Mid-terms Exam:30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	المصدر: حقوق الانسان والطفل والديمقراطية المؤلف: أ. د. ماهر صالح علاوي الجبوري وآخرون بر سنة الطبع: وزارة التعليم العالي والبحث العلمي - جامعة تكريت، 2009
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:																																																												
Calculus II																																																												
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7. Course administrator's name (mention all, if more than one name)																																																												
Name: Lecturer Suhad Kasim																																																												
Email: bashar.bahaa@nahrainuniv.edu.iq																																																												
8. Course Objectives																																																												
Course Objectives		1-To understand complex numbers and basic operation over them. 2-To deal with basic mathematics concepts. 3-To use learned topics in solving electrical circuit analysis problem. 4-To Develop the knowledge about matrices and basic operation over them. 5-To perform calculation of convergence value of infinite series.																																																										
9. Teaching and Learning Strategies																																																												
Strategy	Weekly lectures and tutorial session to ensure better understanding Quizzes and exams to ensure student learning																																																											
10. Course Structure																																																												
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method																																																							
1	4	A1	Complex Numbers and Functions I Complex Numbers and Their Geometric Representation, Polar Form, Powers and Roots, Polar coordinates, Graphs of polar	Theoretical																																																								

			equations, Polar equations of conics and other functions, Integrals.		
2	4	A1	Complex Numbers and Functions II Derivative of Complex Function, Exponential Function, Trigonometric and Hyperbolic Functions. Euler's Formula.	Theoretical	Quiz I
3	4	A1	Complex Numbers and Functions III Line Integral in the Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula	Theoretical	
4	4	A1	Matrices and Linear Transformation I Matrices, Vectors: Addition and Scalar Multiplication, Matrix Multiplication, Symmetric, Skew-Symmetric, and Orthogonal Matrices.	Theoretical	Test I
5	4	A1	Matrices and Linear Transformation II Linear Systems of Equations. Gauss Elimination, Linear Independence. Rank of a Matrix, Vector Space	Theoretical	
6	4	A1	Matrices and Linear Transformation III Solutions of Linear Systems, Existence, Uniqueness, Determinants, Cramer's Rule, Inverse of a Matrix, Gauss-Jordan Elimination	Theoretical	Quiz II
7	4	A1	Integration Methods I Basic integration formulas, Integration by parts, Products and powers of trigonometric functions, Even powers of sines and cosines.	Theoretical	
8	4	A1	Integration Methods II Trigonometric substitutions in integrals. Integrals involving ax^2+bx+c , Partial fractions, $z=\tan(x/2)$, Improper integrals.	Theoretical	Test I
9	4	A1	Plane Analytic Geometry I Conic sections, Equations from the distance formula, Circles.	Theoretical	
10	4	A1	Plane Analytic Geometry II Parabolas. Ellipses, Hyperbolas. Quadratic curves.	Theoretical	
11	4	A1	Hyperbolic Functions Definitions and identities, Derivatives and integrals, The inverse hyperbolic functions.	Theoretical	

12	4	A1	Sequences and Infinite Series I Sequences of numbers, Limits that arise frequently, Infinite sequences and series.	Theoretical	Assignment
13	4	A1	Sequences and Infinite Series II Tests of convergence of series with non-negative terms (integral, comparison, ratio, and root tests), Absolute convergence Alternating series. Conditional convergence.	Theoretical	
14	4	A1	Power Series I Power series for functions, Taylors's theorem with remainder, Sines, cosines, and e^x series.	Theoretical	Seminar
15	4	A1	Power Series II Further computations, logarithms, arctangent and π , Indeterminate forms, Convergence of power series. Integration, differentiation, Multiplication, and division.	Theoretical	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas and Finney, Calculus and Analytic Geometry, Edition and year public: Pearson Education Inc,11 th Ed 20082009
Main references (sources)	Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons Inc, 10 th Ed. 2011
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. To learn and understand computer language and program design. 2. To learn C++ program language. 3. Understand the concept of the array 4. Get knowledge on how to write a function . 																																																																																																																																																																
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Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in lecture discussions and lab sessions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.																																																																																																																																																																
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1	4	A2,B2,C2	Computer Network: Types of Computer Networks, Network Components, Network Topology	Theoretical, Lab	Lab
2	4	A2,B2,C2	The Internet: Concept of Internet, Evolution of Internet, World Wide Web, Basic Internet Terminology, Types of Internet Connections, Uses of Internet, E-commerce	Theoretical, Lab	Quiz I, Lab
3	4	A2,B2,C2	Computer Viruses	Theoretical, Lab	Lab
4	4	A2,B2,C2	Application Program 1: Microsoft Word,	Theoretical, Lab	Test I, Lab
5	4	A2,B2,C2	Application Program 2: Microsoft Excel	Theoretical, Lab	Lab
6	4	A2,B2,C2	Application Program 3: Microsoft PowerPoint	Theoretical, Lab	Quiz II, Lab
7	4	A2,B2,C2	C++ Programming Language: Functions	Theoretical, Lab	Lab
8	4	A2,B2,C2	C++: One Dimensional Array	Theoretical, Lab	Test I, Lab
9	4	A2,B2,C2	C++: Multidimensional Array	Theoretical, Lab	Lab
10	4	A2,B2,C2	C++: String, Array of Characters	Theoretical, Lab	Lab
11	4	A2,B2,C2	C++: Vector	Theoretical, Lab	Lab
12	4	A2,B2,C2	C++ Pointers: Call by reference, addresses, types & array of pointers	Theoretical, Lab	Assignments
13	4	A2,B2,C2	Classes	Theoretical, Lab	Lab
14	4	A2,B2,C2	Classes string	Theoretical, Lab	Lab
15	4	A2,B2,C2	Introduction to OOP	Theoretical, Lab	Lab
11. Course Evaluation					
Quiz and Assignments:6 Lab: 14 Mid-terms Exam:20					

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if a	-S. M. Freund, et al, Discovering Computers and Microsoft Office 2016: A Fundamental Combined Approach, Cengage Learning, 2017
Main references (sources)	- P. Deitel & H. Deitel, C++ How to Program, 10th Ed., Pearson, 2017
Recommended books and references (scientific journals, reports...)	
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Course Description Form

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Name: Lecturer. Dr. Marwa M. Email:																																																																																																																																																																						
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Course Objectives	<ol style="list-style-type: none"> 1. To provide students with essential theory material in digital logic design and practical experience required in digital logic applications. 2. To understand digital logic design fundamentals. 3. This course deals with the basic concept of binary, decimal, hexadecimal, octal numbers, and the conversion between them. 4. To understand the design of combinational logic circuit and digital device. 5. Understand the memory circuits (RAM, ROM PROM, EPROM and EEPROM). 6. Understand the process of programmable of logic circuit. 7. Solve problem related to digital logic design. 																																																																																																																																																																					
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A2,A4	Digital systems: Decimal, binary, octal, hexadecimal number, number conversions,	Theoretical, Lab	Lab
2	4	A2,A4	BCD, binary and hex arithmetic, complements, signed numbers	Theoretical, Lab	Quiz I, Lab
3	4	A2,A4	Boolean algebra and logic gate, Postulates and theorems of Boolean algebra	Theoretical, Lab	Lab
4	4	A2,A4	Operator Precedence, Boolean function, Complement of a Function	Theoretical, Lab	Test I, Lab
5	4	A2,A4	Canonical and standard forms, Minterms, Maxterms, other logic operations	Theoretical, Lab	Lab
6	4	A2,A4	Algebraic manipulation (Simplification), analysis of logic circuit using truth tables	Theoretical, Lab	Quiz II, Lab
7	4	A2,A4	Simplification of Boolean functions, the map method, two, three, four, five and six variable maps.	Theoretical, Lab	Lab
8	4	A2,A4	Product of sum simplification	Theoretical, Lab	Test I, Lab
9	4	A2,A4	NAND implementation, NOR implementation, don't care conditions.	Theoretical, Lab	Lab
10	4	A2,A4	Design of combinational logic circuit, adder, half-adder, full-adder	Theoretical, Lab	Lab
11	4	A2,A4	Subtractor, half-subtractor, full-subtractor, code conversion	Theoretical, Lab	Lab
12	4	A2,A4	Universal gates NAND, Universal gates NOR	Theoretical, Lab	Assignments
13	4	A2,A4	Magnitude Comparator, Decoder	Theoretical, Lab	Lab
14	4	A2,A4	Demultiplexer, Encoders, Multiplexers	Theoretical, Lab	Lab
15	4	A2,A4	Read-Only Memory (ROM), introduction to sequential circuit	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6

Lab: 14

Mid-terms Exam:20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if a	Digital Fundamentals, Thomas L. Floyd, Prentice-Hall, 11 th Edition, 2015.
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Main references (sources)	Digital Design, M. Morris Mano, 5 th Edition, 2013
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Recommended books and references (scientific journals, reports...)	
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Electronic References, Websites	
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Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. Understand basic DC circuit technology. 2. Analyze circuits with methods of analysis and star-delta transformation. 3. Application of Network Theorems in DC circuits. 4. Understand basic AC circuit technology. 5. Apply circuit analysis methods and theorems in AC and R, L, and C circuits. 6. Calculate and discriminate various power types. 																																																																																																																		
9. Teaching and Learning Strategies																																																																																																																			
Strategy	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in lecture discussions and lab sessions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>																																																																																																																		
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Week	Hour s	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method																																																																																																														

1	4	A2,A4	Fundamentals of DC circuits: current, voltage, circuit components, conductors & insulators, semiconductors.	Theoretical, Lab	Lab
2	4	A2,A4	Fundamentals of DC circuits: Ohms law, dc power, energy, efficiency.	Theoretical, Lab	Quiz I, Lab
3	4	A2,A4	Series Circuits: Kirchhoff's voltage law, voltage divider rule, voltage regulation.	Theoretical, Lab	Lab
4	4	A2,A4	Parallel Circuits: Kirchhoff's current law, current divider rule, power distribution.	Theoretical, Lab	Test I, Lab
5	4	A2,A4	Network Theorems: Thevenin's theorem, Norton's theorem, maximum power transfer, applications.	Theoretical, Lab	Lab
6	4	A2,A4	Methods of Analysis: Branch Current analysis, Mesh analysis, Y & Δ conversion.	Theoretical, Lab	Quiz II, Lab
7	4	A2,A4	AC fundamentals: definitions, sinusoidal waveform, phase relation, peak values, rms value & average values.	Theoretical, Lab	Lab
8	4	A2,A4	The Basic Elements and Phasors: Response of inductors & capacitors in ac circuits, average power & P.F.	Theoretical, Lab	Test I, Lab
9	4	A2,A4	The Basic Elements and Phasors: complex numbers, polar & rectangular forms.	Theoretical, Lab	Lab
10	4	A2,A4	Series and Parallel AC Circuits: The R-L-C circuit in series, impedance diagram, voltage division.	Theoretical, Lab	Lab
11	4	A2,A4	Series and Parallel AC Circuits: The R-L-C in parallel, admittance, current division.	Theoretical, Lab	Lab
12	4	A2,A4	Power (AC): AC power: Real, Reactive and Apparent power, the power triangle, P.F. and P.F. correction.	Theoretical, Lab	Assignments
13	4	A2,A4	Power (AC): AC power: Real, Reactive and Apparent power, the power triangle, P.F. and P.F. correction.	Theoretical, Lab	Lab
14	4	A2,A4	Fundamentals of DC circuits: current, voltage, circuit components, conductors & insulators, semiconductors	Theoretical, Lab	Lab

15	4	A2,A4	Fundamentals of DC circuits: current, voltage, circuit components, conductors & insulators, semiconductors	Theoretical, Lab	Lab
11. Course Evaluation					
Quiz and Assignments:6 Lab: 14 Mid-terms Exam:20 Final Exam: 60					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			INTRODUCTORY CIRCUIT ANALYSIS, 5th Edition (Hard Copy), 10th & 11th Editions (PDF), By : ROBERT L. BOYLESTAD , Prentice Hall		
Main references (sources)			Charles Alexander, Fundamentals of Electric Circuits, McGraw-Hill Education; 5 edition (January 12, 2012)		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. Understand the concept of an ideal diode and its characteristics. 2. Differentiate between static and dynamic resistance in diodes. 3. Analyze the properties of semiconductor materials (Ge & Si). 4. Explain Bohr’s atomic model for Germanium and Silicon. 5. Describe intrinsic semiconductor materials and their energy level diagrams. 6. Differentiate between conductors, insulators, and semiconductors based on conductivity. 																																																																																																																																				
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Strategy	The main strategy that will be adopted in delivering this module is to encourage students’ participation in lecture discussions and lab sessions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.																																																																																																																																				
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A3,B3,C1	Semiconductor Diodes: ideal diode, diode resistance, semiconductor material, Bohr's model of Ge & Si, intrinsic materials, energy levels, material types, and conductivity of conductors	Theoretical, Lab	Lab
2	4	A3,B3,C1	Semiconductor Diodes: extrinsic semiconductors (p-type & n-type), electrons vs. holes flow, majority & minority carriers, current density and conductivity.	Theoretical, Lab	Quiz I, Lab
3	4	A3,B3,C1	Semiconductor Diodes: P-N junction construction, forward biasing and reverse biasing, depletion region, operation, and diode equation, diode's characteristics.	Theoretical, Lab	Lab
4	4	A3,B3,C1	Semiconductor Diodes: Diode resistance (static, dynamic and average), equivalent circuit, Zener diode, LEDs.	Theoretical, Lab	Test I, Lab
5	4	A3,B3,C1	Diode Applications: load-line analysis, diode approximations, series diode configuration, parallel diodes configuration, series-parallel configurations, AND/OR gates.	Theoretical, Lab	Lab
6	4	A3,B3,C1	Diode Applications: half-wave rectifier, peak inverse voltage (PIV).	Theoretical, Lab	Quiz II, Lab
7	4	A3,B3,C1	Diode Applications: full-wave rectifier (Bridge & Center Tap Transformer).	Theoretical, Lab	Lab
8	4	A3,B3,C1	Diode Applications: Clipping and clamping circuits, Voltage Doubler and Tripler, Zener diode circuits and voltage regulation.	Theoretical, Lab	Test I, Lab
9	4	A3,B3,C1	Bipolar Junction Transistor (BJT): construction, operation, configurations (CB, CE & CC),	Theoretical, Lab	Lab
10	4	A3,B3,C1	Bipolar Junction Transistor (BJT): i/p and o/p characteristics, operation regions (saturation, active & cut-off).	Theoretical, Lab	Lab
11	4	A3,B3,C1	BJT DC Biasing Circuits: dc load line analysis, the Q-point, fixed-bias circuit, emitter-stabilized bias.	Theoretical, Lab	Lab

12	4	A3,B3,C1	BJT DC Biasing Circuits: voltage divider bias, voltage feedback bias.	Theoretical, Lab	Assignments
13	4	A3,B3,C1	BJT DC Biasing Circuits: transistor switching circuits (inverter operation).	Theoretical, Lab	Lab
14	4	A3,B3,C1	FET: construction, i/p and o/p c/cs	Theoretical, Lab	Lab
15	4	A3,B3,C1	FET: Biasing circuits (fixed bias, voltage divider bias, self-bias).	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6

Lab: 14

Mid-terms Exam:20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

Second Year First semester

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Course Objectives	<ul style="list-style-type: none"> ● Provide students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary. ● To understand sentences, tenses, and practicing writing. ● This module works towards enhancing students' English language competencies along with their technical or professional knowledge. ● Enhancing students' communication skills in English can result in better job opportunities in the future 																																																																																																																																																																																																																												
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Strategy	The main strategies that will be adopted in delivering this module are: <ul style="list-style-type: none"> - Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. 																																																																																																																																																																																																																												

- Use didactic questioning through questions to determine student understanding of the material.
- Writing an assignment and report that encourages students to clarify and organize their thinking and independently research and present on a topic.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	B4,C2,C3,C4	Sentences with multiple clauses, coordinate connectors, Dates and time ,essay writing, essay topic	Theoretical	
2	2	B4,C2,C3,C4	Sentences with multiple clauses, adverb clauses connectors (time, cause, condition, etc.) , expressing yourself ,writing skills: decode the topic	Theoretical	Quiz I
3	2	B4,C2,C3,C4	Know when to use the past and the present, Use "have" and "had" correctly, common expressions, writing skills: develop supporting ideas	Theoretical	
4	2	B4,C2,C3,C4	Comparatives and superlatives ,common expressions, Writing skills: Introductory paragraph	Theoretical	Test I
5	2	B4,C2,C3,C4	Subject verb agreements , The processor , writing skills: Write unified supporting paragraphs	Theoretical	
6	2	B4,C2,C3,C4	The first Exam	Theoretical	Quiz II
7	2	B4,C2,C3,C4	Use the correct tense with time expressions, operating system , Writing skills: write the concluding paragraph	Theoretical	
8	2	B4,C2,C3,C4	use of will and would , common expressions ,writing skills: connect the supporting paragraphs	Theoretical	Test I
9	2	B4,C2,C3,C4	Recognize active and passive meanings, countable and uncountable nouns, Articles with singulars, distinguish	Theoretical	

			specific and general ideas , Online services		
10	2	B4,C2,C3,C4	Second exam	Theoretical	
11	2	B4,C2,C3,C4	Distinguish make and do,writing practice, programming Languages: C language	Theoretical	
12	2	B4,C2,C3,C4	Distinguish like, alike, unlike, and dislike, Comparing Software Packages Writing practice	Theoretical	Assignments
13	2	B4,C2,C3,C4	Distinguish like, alike, unlike, and dislike, Comparing Software Packages Writing practice	Theoretical	
14	2	B4,C2,C3,C4	Distinguish other, another, others, Computer Networ Writing practice	Theoretical	Seminar
15	2	B4,C2,C3,C4	Distinguish other, another, others, Computer Networ Writing practice	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10
Mid-terms Exam: 30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Keith Boecker, P. Charles Brown, Oxford English Computing, Oxford University press.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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Course Objectives	<ul style="list-style-type: none">• To develop problem solving skills and understanding of related engineering mathematics topics• To perform partial derivatives.• To understand differential equation and its properties.• To understand different solution methods of differential equation.• To develop skills and understanding of vector differential calculus and their physical applications.																																																																																																																																																																																																	
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1	4	A2, B2,C2	Multiple Integral: Basic Definitions, Physical applications	Theoretical	
2	4	A2, B2,C2	Triple integral, Cylindrical coordinates, Spherical coordinates.	Theoretical	Quiz I
3	4	A2, B2,C2	Partial Derivatives	Theoretical	
4	4	A2, B2,C2	Functions of two or more variables, Limits and continuity, Partial derivatives.	Theoretical	Test I
5	4	A2, B2,C2	Ordinary Differential Equations:	Theoretical	
6	4	A2, B2,C2	Basic concepts (order, degree, initial condition, general solution, particular solution).	Theoretical	Quiz II
7	4	A2, B2,C2	Types of differential equations (1st order, 2nd order, higher orders DE).	Theoretical	
8	4	A2, B2,C2	Methods for solving 1st order: separable method, Homogeneous method, Exact method	Theoretical	Test I
9	4	A2, B2,C2	Linear & Bernoulli methods, Methods for solving 2nd order homogenous DE with a constant coefficient.	Theoretical	
10	4	A2, B2,C2	Wronskian determined, Methods for solving 2nd order Non homogenous DE (variation of parameters, undermined and determined).	Theoretical	
11	4	A2, B2,C2	Euler equation, Higher order DE	Theoretical	
12	4	A2, B2,C2	Application Examples of DE	Theoretical	Assignments
13	4	A2, B2,C2	Vector Differential Calculus, Basic Definitions, Dot Product, Cross Product.	Theoretical	
14	4	A2, B2,C2	Vector and Scalar Functions, Vector Derivatives, Curves, Arch Length, Curvature,	Theoretical	Seminar
15	4	A2, B2,C2	Kinds of curves, tangent of curves, length and arc length of curves, chain rule.	Theoretical	
11. Course Evaluation					
Quiz and Assignments: 10					

Mid-terms Exam: 30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas and Finney, Calculus and Analytic Geometry, Pearson Education Inc, 11th Ed. 2008.
Main references (sources)	Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons Inc, 10th Ed. 2011
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

4	4	A1	Tables: Frequency distribution table, Relative frequency distribution, Cumulative frequency distribution	Theoretical	Test I
5	4	A1	Figures: Histogram, Frequency polygon, Ogives, Pi chart	Theoretical	
6	4	A1	Statistical measurements:	Theoretical	Quiz II
7	4	A1	Centrality (mean, median and mode)	Theoretical	
8	4	A1	Dispersion (range, variance, standard deviation)	Theoretical	Test I
9	4	A1	Position (percentile, quartile, inter-quartile range)	Theoretical	
10	4	A1	Moments (laws, values meaning, 3 examples on each moment)	Theoretical	
11	4	A1	Mean, Variance, Skewness, Kurtosis	Theoretical	
12	4	A1	Elementary probability Theory, axioms of probability joint probability, Random Experiment, independent and mutually exclusive events.	Theoretical	Assignments
13	4	A1	Conditional Prob.	Theoretical	
14	4	A1	Joint prob. And conditional probability, Total Probability, Bayes Theorem, repeated (Bernoulli) trials	Theoretical	Seminar
15	4	A1	Random variables.	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10

Mid-terms Exam: 30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Walpole & Myers, "Probability & Statistics for Engineers and Scientists", 8th Ed., 2007, Pearson Prentice Hall

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. The course gives an introduction to Semiconductors (P and N). 2. Gives the basic construction of semiconductor diode and applications. 3. The course gives an introduction to DC and AC models of BJTs and FETs, involving the basic amplifiers' design and circuit analysis in terms of various parameters (Z_i, Z_o, A_v and A_i). 4. Discuss multistage amplifiers with related frequency response. 5. Operational amplifiers (OP-AMP's) types and circuit connections are discussed. 6. Various classes of power amplifiers are also studied. 7. And finally, some overview of oscillators is studied. 																																																																																																																																																										
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A4,B1,C4	Review of BJT DC biasing: current equation, β , α , configurations (CB, CE & CC), biasing circuits.	Theoretical, Lab	Lab
2	4	A4,B1,C4	BJT Modeling: Important parameters (Z_i , Z_o , A_v & A_i), re model (CB, CE & CC), h-parameters.	Theoretical, Lab	Quiz I, Lab
3	4	A4,B1,C4	BJT Small Signal Analysis: CE fixed bias, voltage divider bias, emitter bias, collector feed-back bias, BJT ac equivalent circuit (h-parameters), approximate analysis	Theoretical, Lab	Lab
4	4	A4,B1,C4	BJT Small Signal Analysis: Approximate Hybrid equivalent circuit (Z_i , Z_o , A_v & A_i), exact Hybrid equivalent circuit (Z_i , Z_o , A_v & A_i).	Theoretical, Lab	Test I, Lab
5	4	A4,B1,C4	Field Effect Transistor (FET): construction, current equations, characteristic, configuration, depletion type, enhancement type.	Theoretical, Lab	Lab
6	4	A4,B1,C4	FET Biasing: fixed bias, self bias, voltage divider bias, transfer characteristics.	Theoretical, Lab	Quiz II, Lab
7	4	A4,B1,C4	FET Small-Signal Analysis: small-signal model (fixed, self, & voltage divider biasing)	Theoretical, Lab	Lab
8	4	A4,B1,C4	Multistage Amplifier: Direct coupled, Capacitor coupled, transformer coupled.	Theoretical, Lab	Test I, Lab
9	4	A4,B1,C4	Feedback Amplifier: voltage-series, current-series, voltage shunt, current shunt	Theoretical, Lab	Lab
10	4	A4,B1,C4	Feedback Amplifier: gain without feedback, gain with feedback, feedback factor, practical circuits.	Theoretical, Lab	Lab
11	4	A4,B1,C4	Operational Amplifiers: single ended, double ended, Op-Amp basics, practical Op-Amp circuits (inverting, non-inverting, follower, summing, Integrator, differentiator).	Theoretical, Lab	Lab
12	4	A4,B1,C4	Operational Amplifiers: off-set parameters, Op-Amp applications (constant gain, multiple stage).	Theoretical, Lab	Assignments

13	4	A4,B1,C4	Power Amplifiers: classes (A, B, AB, C & d), series-fed class A, transformer coupled class A, single swing and output AC power, efficiency.	Theoretical, Lab	Lab
14	4	A4,B1,C4	Power Amplifiers: class B operation, input DC Power, output AC power, class C, class D.	Theoretical, Lab	Lab
15	4	A4,B1,C4	Oscillators: Barkhausen criterion, phase-shift oscillator (FET & BJT), Wien bridge oscillator, Colpitt's oscillator (FET & BJT), Hartley oscillator (FET & BJT), crystal oscillator.	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6
 Lab: 14
 Mid-terms Exam:20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	ELECTRONIC DEVICES AND CIRCUIT THEORY, 6th Edition (Hard Copy), 7th Ed. (PDF) By: ROBERT BOYLESTAD and LOUIS NASHELSKY, Prentice Hall
Main references (sources)	Integrated Electronics by: Millman and Halkias , McGraw Hill
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

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Course Objectives	<ol style="list-style-type: none">1. To provide fundamental concepts of Object-Oriented Programming and make students familiar with Java environment and its applications.2. To learn and understand OOP principles.3. To write, compile and execute Java programs.4. To understand the Java architecture and use the Java APIs.																																																																																																																																																										
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A2,B2,C2	Java Basics Java project in an IDE(Intellij, Eclipse, Netbeans) The starting point of a java project (Main Class) The starting point of a java class (Main Method) Getting output from the program (System.out)	Theoretical, Lab	Lab
2	4	A2,B2,C2	Getting user input (Scanner) Storing data in memory and retrieving it later (Variables) Using variables with console output from week 1	Theoretical, Lab	Quiz I, Lab
3	4	A2,B2,C2	Conditional statements and logical operators (IF, &, , >, <, <=, >=, ==) And Switch statements. Difference between IF and Switch	Theoretical, Lab	Lab
4	4	A2,B2,C2	Repeating statements (For loops, While loops, Do..while)	Theoretical, Lab	Test I, Lab
5	4	A2,B2,C2	Storing multiple values in a single variable Arrays. Iterating over Arrays (for i and foreach)	Theoretical, Lab	Lab
6	4	A2,B2,C2	Working with multiple Classes and Packages (Creating and Using)	Theoretical, Lab	Quiz II, Lab
7	4	A2,B2,C2	OOP: Creating objects and using them through Inheritance and Member variables	Theoretical, Lab	Lab
8	4	A2,B2,C2	The word Static, static Variables, static Methods.	Theoretical, Lab	Test I, Lab
9	4	A2,B2,C2	Advanced OOP the word super and this, @Override	Theoretical, Lab	Lab
10	4	A2,B2,C2	What are Exceptions? Handling Exceptions, try-catch block, throw statement	Theoretical, Lab	Lab
11	4	A2,B2,C2	Using classes from the Java API difference between StringBuilder and String And String manipulation	Theoretical, Lab	Lab
12	4	A2,B2,C2	Converting between Numbers and Strings String.valueOf(), Integer.parseInt()	Theoretical, Lab	Assignments

13	4	A2,B2,C2	The Date class Parsing and Formatting Dates using SimpleDateFormat	Theoretical, Lab	Lab
14	4	A2,B2,C2	Generics Classes and Methods	Theoretical, Lab	Lab
15	4	A2,B2,C2	The java Collections API (List,Set, Map) and their base implementations (ArrayList, HashSet, HashMap)	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6

Lab: 14

Mid-terms Exam:20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Paul J. Deitel, Harvey Deitel, Java How to Program, Early Objects, 11th Ed. 2017
Main references (sources)	C. Thomas Wu, An Introduction to: Object- Oriented Programming in Java™, 5th Ed. 2010
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. This course covers the fundamental concepts of database systems. 2. Topics include data models (ER, relational, and others); query languages (relational algebra, SQL, and others); Boolean Operator, Normalization of a database, Storage and Query Processing, implementation techniques of database management systems. 3. Understanding data structures for data storage and manipulation. 4. Design and analysis of simple linear and non-linear data structures. 5. Selection of relevant data, attributes, sets of data. 6. Applying appropriate datasets, and data structures for a given real-time problem solving. 																																																																																																																																																																																																																								
9. Teaching and Learning Strategies																																																																																																																																																																																																																									
Strategy	The main strategy that will be give introduction to students on database and data structure ; Know the fundamentals of Structured Query Language (SQL) and how it can be used to store and retrieve data from a relational database. Each chapter ends with a set of exercises, suitable as assigned homework. The exercises are either short questions that test basic mastery of the material covered, longer questions that require analytical thinking, or implementation projects, Some exercises can also be used as research discussion topics.																																																																																																																																																																																																																								
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1,B1,B2	Introduction to the theory of Database	Theoretical, Lab	Lab
2	4	A1,B1,B2	Database and Database users	Theoretical, Lab	Quiz I, Lab
3	4	A1,B1,B2	Database System Concepts and Architecture	Theoretical, Lab	Lab
4	4	A1,B1,B2	Data Modeling Using the Entity Relationship (ER) Model	Theoretical, Lab	Test I, Lab
5	4	A1,B1,B2	Introduction to SQL and relational database concepts	Theoretical, Lab	Lab
6	4	A1,B1,B2	Relational Database Constraints	Theoretical, Lab	Quiz II, Lab
7	4	A1,B1,B2	Normalization of a database	Theoretical, Lab	Lab
8	4	A1,B1,B2	Continuation of the normalization process.	Theoretical, Lab	Test I, Lab
9	4	A1,B1,B2	ER – to - Relational Mapping	Theoretical, Lab	Lab
10	4	A1,B1,B2	Storage and Query Processing.	Theoretical, Lab	Lab
11	4	A1,B1,B2	Frequency-Domain Signal Analysis.	Theoretical, Lab	Lab
12	4	A1,B1,B2	Continuation of the Frequency	Theoretical, Lab	Assignments
13	4	A1,B1,B2	Transaction Management.	Theoretical, Lab	Lab
14	4	A1,B1,B2	Continuation of the transaction Management.	Theoretical, Lab	Lab
15	4	A1,B1,B2	Review of the lectures	Theoretical, Lab	Lab
11. Course Evaluation					
Quiz and Assignments:6					

Lab: 14
Mid-terms Exam:20
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	J. Date, "Introduction to Database Systems", 8th Ed. Publisher: Addison-Wesley, 2003
Main references (sources)	Database Systems the Complete Book by H. Garcia-Molina and et al. Prentice Hall; 2nd Edition
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Second Year Second semester

Course Description Form

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Name: Lecturer Dr. Ammar Neamah Awda Email: Ammar69a@yahoo.com																																																																																																																																																											
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Course Objectives	<ul style="list-style-type: none"> ○ To demonstrate theoretical knowledge in management course. ○ To gain practical skills and personal attributes and competencies that is required for managerial position. ○ To describe the four management functions of planning, organizing, leading, and controlling. ○ To outline the historical evolution of management theories. ○ To explain how decisions are made within an organization and how those decisions are communicated to the various stakeholders. ○ To relate the basic concepts of planning: the importance of planning, strategic planning, and the types of objectives and plans developed by organizations. ○ To describe the various forms of structure available to an organization. ○ To describe the control process including: the importance of control, tools for measuring organizational performance, and managerial actions. 																																																																																																																																																										
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1	2	A1, A4,C2	Managing and Performing, Managerial Decision Making	Theoretical	
2	2	A1, A4,C2	The History of management	Theoretical	Quiz I
3	2	A1, A4,C2	External and Internal organizational Environments and Corporate Culture	Theoretical	
4	2	A1, A4,C2	Ethics, corporate social responsibility	Theoretical	Test I
5	2	A1, A4,C2	International Management	Theoretical	
6	2	A1, A4,C2	The Strategic Analysis.	Theoretical	Quiz II
7	2	A1, A4,C2	First Assessment (Lecture will continue after the assessment)	Theoretical	
8	2	A1, A4,C2	The Strategic Management Process	Theoretical	Test I
9	2	A1, A4,C2	Continue: The Strategic Management Process	Theoretical	
10	2	A1, A4,C2	, Selection Criteria	Theoretical	
11	2	A1, A4,C2	Organizational Structures	Theoretical	
12	2	A1, A4,C2	Human Resource Management	Theoretical	Assignments
13	2	A1, A4,C2	Second assessment +Continue Human Resource Management	Theoretical	
14	2	A1, A4,C2	Leadership	Theoretical	Seminar
15	2	A1, A4,C2	Work Motivation for performance	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10

Mid-terms Exam: 30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Principles of Management, Anastasia H. Cortes, David S Bright, and Eva Hartmann, 1st Edition, 2019

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

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Course Objectives	<ul style="list-style-type: none"> To develop problem solving skills and understanding of related engineering mathematics topics To develop skills in evaluating multiple integral, different coordinate systems covering physical applications. To perform integration of vectors. To understand Laplace transform and its properties. To understand Fourier analysis and transform in signal analysis and spectral measure. 																																																																																																																																																														
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1	4	A1, A4,C2	Vector Integral Calculus: Line Integrals, Double Integrals,	Theoretical	
2	4	A1, A4,C2	Green's Theorem, Surface area and surface Integral.	Theoretical	Quiz I
3	4	A1, A4,C2	Stokes's Theorem, Divergence Theorem.	Theoretical	
4	4	A1, A4,C2	Laplace Transforms I: Laplace Transform. Linearity. First Shifting Theorem (s -Shifting), Transforms of Derivatives and Integrals.	Theoretical	Test I
5	4	A1, A4,C2	Laplace Transforms II: Unit Step Function, Second Shifting Theorem (t -Shifting), Short Impulses. Dirac's Delta Function. Partial Fractions, Gamma functions	Theoretical	
6	4	A1, A4,C2	Laplace Transforms III: Other useful properties, Convolution. Integral Equations, Differentiation and Integration of Transforms, Systems of ODEs	Theoretical	Quiz II
7	4	A1, A4,C2	Laplace Transforms IV: Inverse Laplace Transform, General Formulas and Applications	Theoretical	
8	4	A1, A4,C2	Laplace Transforms V: Solution of PDEs by Laplace Transforms	Theoretical	Test I
9	4	A1, A4,C2	Fourier Analysis I: Arbitrary Period. Even and Odd Functions. Half-Range Expansions, Forced Oscillations	Theoretical	
10	4	A1, A4,C2	Fourier Analysis II: Approximation by Trigonometric Polynomials, Sturm–Liouville Problems. Orthogonal Functions, Orthogonal Series.	Theoretical	
11	4	A1, A4,C2	Fourier Analysis III: Generalized Fourier Series, The use of Fourier Series in spectral analysis	Theoretical	
12	4	A1, A4,C2	Fourier Analysis IV: Fourier Integral, Fourier Cosine and Sine Transforms,	Theoretical	Assignments

			Fourier Transform. Fourier Transform properties.		
13	4	A1, A4,C2	Fourier Analysis V: Fourier Transform of some useful functions, Discrete and Fast Fourier Transforms	Theoretical	
14	4	A1, A4,C2	Series Solutions of ODE I: Power Series Method, Legendre's Equation. Legendre Polynomials $P_n(x)$, Extended Power Series Method: Frobenius Method	Theoretical	Seminar
15	4	A1, A4,C2	Series Solutions of ODE II: Bessel's Equation. Bessel Functions $J_\nu(x)$, Bessel Functions of the $Y_\nu(x)$. General Solution	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10
 Mid-terms Exam: 30
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas and Finney, Calculus and Analytic Geometry, Pearson Education Inc, 11th Ed. 2008.
Main references (sources)	Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons Inc, 10th Ed. 2011
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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8. Course Objectives																																																																																																																																			
Course Objectives	<p>The aim of the course is to</p> <ul style="list-style-type: none"> Introduce the students to the basic terms in signals and systems and Learn basic types of signals (sinusoidal, exponential, unit step, and impulse) Determine the properties of signals (periodicity, energy, and average power) Classify signals and systems based on system equation into (causal, memory, linear, time varying, and stable) Determine the output of continuous LTI system and their response to impulse response by means of convolution integral. Determine the Laplace transform of common signals and their properties. Decompose periodic signals into their Fourier series components. Transform continuous- time signals into frequency domain using Fourier transform Introduce students to the basic idea of filtering. 																																																																																																																																		
9. Teaching and Learning Strategies																																																																																																																																			
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, laboratory and by considering the type of simple experiments involving some sampling activities that are interesting to the students.																																																																																																																																		

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A1, B1, B2	Vector Integral Calculus: Line Integrals, Double Integrals,	Theoretical, Lab	Lab
2	5	A1, B1, B2	Green's Theorem, Surface area and surface Integral.	Theoretical, Lab	Quiz I, Lab
3	5	A1, B1, B2	Stokes's Theorem, Divergence Theorem.	Theoretical, Lab	Lab
4	5	A1, B1, B2	Laplace Transforms I: Laplace Transform. Linearity. First Shifting Theorem (s -Shifting), Transforms of Derivatives and Integrals.	Theoretical, Lab	Test I, Lab
5	5	A1, B1, B2	Laplace Transforms II: Unit Step Function, Second Shifting Theorem (t -Shifting), Short Impulses. Dirac's Delta Function. Partial Fractions, Gamma functions	Theoretical, Lab	Lab
6	5	A1, B1, B2	Laplace Transforms III: Other useful properties, Convolution. Integral Equations, Differentiation and Integration of Transforms, Systems of ODEs	Theoretical, Lab	Quiz II, Lab
7	5	A1, B1, B2	Laplace Transforms IV: Inverse Laplace Transform, General Formulas and Applications	Theoretical, Lab	Lab
8	5	A1, B1, B2	Laplace Transforms V: Solution of PDEs by Laplace Transforms	Theoretical, Lab	Test I, Lab
9	5	A1, B1, B2	Fourier Analysis I: Arbitrary Period. Even and Odd Functions. Half-Range Expansions, Forced Oscillations	Theoretical, Lab	Lab
10	5	A1, B1, B2	Fourier Analysis II: Approximation by Trigonometric Polynomials, Sturm–Liouville Problems.	Theoretical, Lab	Lab

			Orthogonal Functions, Orthogonal Series.		
11	5	A1, B1, B2	Fourier Analysis III: Generalized Fourier Series, The use of Fourier Series in spectral analysis	Theoretical, Lab	Lab
12	5	A1, B1, B2	Fourier Analysis IV: Fourier Integral, Fourier Cosine and Sine Transforms, Fourier Transform. Fourier Transform properties.	Theoretical, Lab	Assignments
13	5	A1, B1, B2	Fourier Analysis V: Fourier Transform of some useful functions, Discrete and Fast Fourier Transforms	Theoretical, Lab	Lab
14	5	A1, B1, B2	Series Solutions of ODE I: Power Series Method, Legendre's Equation. Legendre Polynomials $P_n(x)$, Extended Power Series Method: Frobenius Method	Theoretical, Lab	Lab
15	5	A1, B1, B2	Series Solutions of ODE II: Bessel's Equation. Bessel Functions $J_\nu(x)$, Bessel Functions of the $Y_\nu(x)$. General Solution	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6
 Lab: 14
 Mid-terms Exam:20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	UNDAMENTALS OF SIGNALS AND SYSTEMS, BENOIT BOULET, CHARLES RIVER MEDIA Boston, Massachusetts, 2006
Main references (sources)	Digital Signal Processing, By John G. Proakis, Dimitris G. Manolakis, 2007
Recommended books and references (scientific journals, reports...)	
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Course Objectives	<ul style="list-style-type: none"> • The objectives of this module are to provide students with the fundamental theory and practical materials of digital systems design required in their study and for other related courses. • How to relate the skills and concepts learned from fundamental digital design to understanding advanced digital design. • How to use the learned skills to understand, derive, and solve the digital & logical equations of a digital circuit, and systems in various objects. • Representation of the fundamental concepts of advanced digital design and implementation by understanding practical digital devices. 																																																																																																																																																																					
9. Teaching and Learning Strategies																																																																																																																																																																						
Strategy	<p>The main strategy that is adopted in the delivery of this module is to encourage students to persevere, follow through and participate in all the activities of the subject while improving and expanding their critical thinking skills. This will be achieved through classes and interactive tutorials and by considering practical experiments. In addition, by implementing a number of techniques such as:</p> <ul style="list-style-type: none"> • Visualization: which is a useful technique to process or summarize the knowledge that has been instructed in class. It allows students to grasp information more effectively through visual memory. • Teamwork: By dividing the class into groups to complete a task. Group assignments improve teamwork and help students to succeed. However, it needs to be well-managed and requires a level of independence. 																																																																																																																																																																					

- Inquiry-Based Teaching: By encouraging students to ask questions and work with one another to solve any problem, which not only motivates them to think more practically but also helps them to become independent learners.
- Implementing Technology in the Classroom: Such as the use of PowerPoint presentations, videos, virtual classrooms, and augmented reality (AR) which not only add liveliness to the classroom but also lead to a more inclusive and effective learning environment that improves inquisitiveness and collaboration between the students and allows educators to compile data on student performance.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1, B1, B2	Boolean Algebra, Boolean Functions, VHDL, and Gates	Theoretical, Lab	Lab
2	4	A1, B1, B2	Logic Circuit Analysis and Design	Theoretical, Lab	Quiz I, Lab
3	4	A1, B1, B2	Propagation Delay Time, Decoders, Multiplexers,	Theoretical, Lab	Lab
4	4	A1, B1, B2	Combinational Logic Circuit Design with VHDL, The Library Part, The Entity Declaration, The Architecture Declaration, Dataflow Design Style	Theoretical, Lab	Test I, Lab
5	4	A1, B1, B2	Behavioral Design Style, Structural Design Style	Theoretical, Lab	Lab
6	4	A1, B1, B2	Bistable Memory Device Design with VHDL, Analyzing an S-R LATCH,	Theoretical, Lab	Quiz II, Lab
7	4	A1, B1, B2	Designing a Simple Clock, Designing a D LATCH	Theoretical, Lab	Lab
8	4	A1, B1, B2	Simple Finite State Machine Design with VHDL, Synchronous Circuits, Creating D-Type Flip-Flops in VHDL	Theoretical, Lab	Test I, Lab
9	4	A1, B1, B2	Designing Simple Synchronous Circuits, Counter Design Using the Algorithmic Equation Method	Theoretical, Lab	Lab

10	4	A1, B1, B2	Non-Conventional Counter Design Using the Algorithmic Equation Method, Counter Design Using the Arithmetic Method	Theoretical, Lab	Lab
11	4	A1, B1, B2	Frequency Division, Counter Design Using the PS/NS Tabular Method, Non-Conventional Counter Design Using the PS/NS Tabular Method	Theoretical, Lab	Lab
12	4	A1, B1, B2	Three-State Outputs and the Disconnected State, Data Bus Sharing for a Microcomputer System, Single-Bit Error Detection System	Theoretical, Lab	Assignments
13	4	A1, B1, B2	Comparators and Greater Than Circuits, Adder Design	Theoretical, Lab	Lab
14	4	A1, B1, B2	Designing Ripple-Carry Adders and Subtractors	Theoretical, Lab	Lab
15	4	A1, B1, B2	Designing Carry Look-Ahead Adders	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6
 Lab: 14
 Mid-terms Exam:20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curriculum books, if any)	Richard S. Sandige and Michael L. Sandige, Fundamentals of Digital and Computer Design with VHDL, McGraw-Hill, 2012.
Main references (sources)	Morris Mano, "Digital Design", 3rd Ed. , Pearson Education, 2012. Floyd, Thomas L , Digital Fundamentals, 11/e. Pearson Education; 2015 Malvino , "Digital Computer Electronics", 2nd Ed., Tata McGraw Hill Education Ltd., 2011.
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Course Objectives	<ul style="list-style-type: none"> • Build an understanding of the fundamental concepts of computer networking. • Independently understand basic computer network technology. • Identify the different types of network topologies and protocol. • Be familiar with various types of computer networks. • Describe how computer networks are organized with the concept of layered approach 																																																																																																																																								
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Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.																																																																																																																																								
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1	4	A4, B1, C4	Boolean Algebra, Boolean Functions, VHDL, and Gates	Theoretical, Lab	Lab
2	4	A4, B1, C4	Logic Circuit Analysis and Design	Theoretical, Lab	Quiz I, Lab
3	4	A4, B1, C4	Propagation Delay Time, Decoders, Multiplexers,	Theoretical, Lab	Lab
4	4	A4, B1, C4	Combinational Logic Circuit Design with VHDL, The Library Part, The Entity Declaration, The Architecture Declaration, Dataflow Design Style	Theoretical, Lab	Test I, Lab
5	4	A4, B1, C4	Behavioral Design Style, Structural Design Style	Theoretical, Lab	Lab
6	4	A4, B1, C4	Bistable Memory Device Design with VHDL, Analyzing an S-R LATCH,	Theoretical, Lab	Quiz II, Lab
7	4	A4, B1, C4	Designing a Simple Clock, Designing a D LATCH	Theoretical, Lab	Lab
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11	4	A4, B1, C4	Frequency Division, Counter Design Using the PS/NS Tabular Method, Non-Conventional Counter Design Using the PS/NS Tabular Method	Theoretical, Lab	Lab
12	4	A4, B1, C4	Three-State Outputs and the Disconnected State, Data Bus Sharing for a Microcomputer System,	Theoretical, Lab	Assignments

			Single-Bit Error Detection System		
13	4	A4, B1, C4	Comparators and Greater Than Circuits, Adder Design	Theoretical, Lab	Lab
14	4	A4, B1, C4	Designing Ripple-Carry Adders and Subtractors	Theoretical, Lab	Lab
15	4	A4, B1, C4	Designing Carry Look-Ahead Adders	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments:6

Lab: 14

Mid-terms Exam:20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curriculum books, if any)	Larry L. Peterson and Bruce S. Davie, "Computer Networks a systems approach", 5 th edition, 2011.
Main references (sources)	Computer Networks, Book by Andrew S. Tanenbaum, 2010
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Course Objectives	<ul style="list-style-type: none"> introduces students to wave propagation behavior in Communication System channels and circuits. This course deals with the study of wave propagation in transmission lines provides an introduction to wave propagation behavior in optical fibers. 																																																																																																																																																																																																																																																																																							
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1	3	A2, B2,C2	Related Mathematical Topics	Theoretical																																																																																																																																																																																																																																																																																				

			Vector Algebra, Coordinate Systems & Transformation, Vector Calculus		
2	3	A2, B2,C2	Electric fields in material space Properties of materials, conductors, dielectrics.	Theoretical	Quiz I
3	3	A2, B2,C2	Magnetization in materials Magnetization in material, classification of magnetic materials	Theoretical	
4	3	A2, B2,C2	Maxwell Equations Faraday's Law, Motional EMF, Maxwell Equation in final forms, Time varying potentials, Time harmonic fields.	Theoretical	Test I
5	3	A2, B2,C2	Electromagnetic wave propagation Wave in general, wave propagation in: lossy dielectric, lossless dielectric, free space, good conductors.	Theoretical	
6	3	A2, B2,C2	Modeling of transmission lines using distributed parameters, T.L equation, and Input impedance.	Theoretical	Quiz II
7	3	A2, B2,C2	VSWR, Reflection Coefficients, Power, efficiency of T.L	Theoretical	
8	3	A2, B2,C2	Wave equation for the case of lossless TL and the distortionless case.	Theoretical	Test I
9	3	A2, B2,C2	Matching of T.L : Quarter-wave and stub tuners matching techniques, Design of matching elements	Theoretical	
10	3	A2, B2,C2	Optical Fiber Transmission	Theoretical	
11	3	A2, B2,C2	Lasers	Theoretical	
12	3	A2, B2,C2	Optical Modulators and Modulation Schemes	Theoretical	Assignments
13	3	A2, B2,C2	Optical Receivers	Theoretical	
14	3	A2, B2,C2	Optical Amplifiers.	Theoretical	Seminar
15	3	A2, B2,C2	Electric fields in material space Properties of materials, conductors, dielectrics.	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10

Mid-terms Exam: 30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Elements of Electromagnetics, Sadiku 5th Ed,
John Wiley & Sons, 2009

Main references (sources)

Recommended books and references (scientific
journals, reports...)

Electronic References, Websites

Third Year

First semester

Course Description Form

1. Course Name:

Democracy

2. Course Code:

DEMO300

3. Semester / Year:

1 semester/ 3rd year

4. Description Preparation Date:

22/4/2025

5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل (٢٠٢٥/٢٠٢٤) المرحلة ()										رقم الاسبوع ()	
										اسم المادة	
										عدد الساعات	
										اسم التدريسي + التوقيع + التاريخ	
										اسم الطالب	

6. Number of Credit Hours (Total) / Number of Units (Total)

2/2

7. Course administrator's name (mention all, if more than one name)

Name: Asst. Lecturer Mustafa Abdulkareem

Email:

8. Course Objectives

Course Objectives	مادة الديمقراطية من المواد الهامة والضرورية للطلبة حيث ان الطالب يحتاج الى المام بثقافة الديمقراطية ومعرفة العلمية لما في ذلك من اهمية كبيرة في فهم تطورها عبر العصور ومفهومها واشكالها وسبل ممارستها ، كما ان دراسة الديمقراطية دراسة علمية سيسهم في ارساء دولة القانون التي تعتمد الديمقراطية اساسا وركيزة لبنائها
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9. Teaching and Learning Strategies

Strategy	القدرة على معرفة هذه الحقوق والحريات والعمل به
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1, B1	جذور مفهوم الديمقراطية وتطوره	Theoretical	
2	2	A1, B1	في تعريف الديمقراطية	Theoretical	Quiz I
3	2	A1, B1	الديمقراطية العالمية والخصوصية	Theoretical	
4	2	A1, B1	الديمقراطية العالمية والخصوصية	Theoretical	Test I

5	2	A1, B1	اشكال الديمقراطية/الديمقراطية المباشرة	Theoretical	
6	2	A1, B1	الديمقراطية شبه المباشرة	Theoretical	Quiz II
7	2	A1, B1	الديمقراطية التمثيلية (النيابية)	Theoretical	
8	2	A1, B1	الديمقراطية التمثيلية (النيابية)	Theoretical	Test I
9	2	A1, B1	اللية النظام (الانتخاب التمثيلي)	Theoretical	
10	2	A1, B1	اللية النظام (الانتخاب التمثيلي)	Theoretical	
11	2	A1, B1	تنظيم عملية الانتخاب	Theoretical	
12	2	A1, B1	تنظيم عملية الانتخاب	Theoretical	Assignments
13	2	A1, B1	نظم الانتخابات	Theoretical	
14	2	A1, B1	نظم الانتخابات	Theoretical	Seminar
15	2	A1, B1	مفهوم جذور الديمقراطية وتطوره	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10
Mid-terms Exam: 30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	الحكم الصالح
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. To develop problem solving skills and understanding of related numerical methods topics 2. To understand absolute and relative errors, rounding and computer errors. 3. To understand how to find roots of equation using numerical methods. 4. To analyze system of linear equation. 5. To perform methods of least square and interpolation. 6. To evaluate different numerical integration 7. To determine numerical differentiation 8. To solve numerically ordinary differential equation and related physical systems 																																																																																																																																																																																
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	B3,B4,C1-C4	Introduction to numerical methods, absolute and relative errors, computer errors.	Theoretical, Lab	Lab
2	4	B3,B4,C1-C4	Roots of equations I	Theoretical, Lab	Quiz I, Lab
3	4	B3,B4,C1-C4	Bisection methods	Theoretical, Lab	Lab
4	4	B3,B4,C1-C4	Roots of equations II	Theoretical, Lab	Test I, Lab
5	4	B3,B4,C1-C4	Newton methods, Secant methods	Theoretical, Lab	Lab
6	4	B3,B4,C1-C4	Solution of linear equations I	Theoretical, Lab	Quiz II, Lab
7	4	B3,B4,C1-C4	Gaussian elimination, matrix inversion using Gauss Jordan elimination method	Theoretical, Lab	Lab
8	4	B3,B4,C1-C4	Solution of linear equations II	Theoretical, Lab	Test I, Lab
9	4	B3,B4,C1-C4	Iterative methods: Jacobi's, Gauss-Seidel method and their analysis	Theoretical, Lab	Lab
10	4	B3,B4,C1-C4	review of Taylor series	Theoretical, Lab	Lab
11	4	B3,B4,C1-C4	Interpolation methods I	Theoretical, Lab	Lab
12	4	B3,B4,C1-C4	Methods of least squares, linear regression, multiple regression Interpolation	Theoretical, Lab	Assignments, Lab
13	4	B3,B4,C1-C4	Interpolation methods II	Theoretical, Lab	Lab
14	4	B3,B4,C1-C4	Newton's Divided difference method,	Theoretical, Lab	Seminar, Lab

			Lagrange interpolation method		
15	4	B3,B4,C1-C4	Numerical differentiation, estimating derivatives, Richardson extrapolation	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Steven C. Chapra & Raymond P. Canal , Numerical Methods for Engineers , seventh edition ,2015.
Main references (sources)	George F. Pinder , Numerical Methods for Solving Partial Differential Equations ,2018
Recommended books and references (scientific journals, reports...)	Faires & Burden, Numerical Methods, 3rd edition, 200
Electronic References, Websites	

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Course Objectives	<ol style="list-style-type: none"> 1. To learn the basic structure and operations of a computer. 2. To understand what a Computer function and interconnection of is, structure, buses, and PCI. 3. To learn the arithmetic and logic unit and the basics of pipelined execution. 4. To understand the memory hierarchies, cache memories and virtual memories and I/O devices. 5. To understand parallelism and multi-core processors. 																																																																																																																																																																																						
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Strategy	The main strategy that will be adopted in delivering this module is to encourage student participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through theoretical and scientific lectures, in addition to self-learning and obtaining information, whether inside or outside the classroom, and devising ways to obtain information on their own.																																																																																																																																																																																						
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method																																																																																																																																																																																		

1	3	A3,A4, C1	Introduction: organization and architecture structure and function.	Theoretical	
2	3	A3,A4, C1	Computer evaluation and performance : history of computer , designing for performance , Pentium and power PC evolution	Theoretical	Quiz I
3	3	A3,A4, C1	Computer function and interconnection (I) :computer components , computer functions	Theoretical	
4	3	A3,A4, C1	Computer function and interconnection (II): interconnection structure, bus interconnection, PCI.	Theoretical	Test I
5	3	A3,A4, C1	Cache memory: computer memory system, cache memory principles, elements of cache design.	Theoretical	
6	3	A3,A4, C1	Internal memory: semiconductor main memory, error correction, DRAM organization	Theoretical	Quiz II
7	3	A3,A4, C1	Input / Output(I) : external devices , I/O modules , programmed I/O.	Theoretical	
8	3	A3,A4, C1	Input / Output(II) : DMA , I/O channel and processors	Theoretical	Test I
9	3	A3,A4, C1	Computer architecture: arithmetic and logic unit , integer arithmetic floating point representation , floating point arithmetic	Theoretical	
10	3	A3,A4, C1	Instruction-Level Parallelism and Superscalar Processors Overview, Design Issues, Pentium 4	Theoretical	
11	3	A3,A4, C1	Instruction sets: machine instruction, type of operands, data type, and operations addressing modes, instruction formats	Theoretical	
12	3	A3,A4, C1	CPU structure: processor organization , register organization CPU function : instruction cycle , instruction pipelining	Theoretical	Assignments

13	3	A3,A4, C1	Parallel Organization, Parallel Processing, The Use of Multiple Processors, Symmetric Multiprocessors, Cache Coherence and the MESI Protocol, Clusters,	Theoretical	
14	3	A3,A4, C1	Multicore Computers, Hardware Performance Issues, Software Performance Issues, Multicore Organization, Case study Pentium and power PC processor.	Theoretical	Seminar
15	3	A3,A4, C1	Introduction: organization and architecture structure and function.	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10
Mid-terms Exam: 30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Computer Organization and Architecture: Design for Performance, William Stallings 2009
Main references (sources)	Patterson & Hennessy, "Computer Organization and Design", Morgan Kaufmann, 2007
Recommended books and references (scientific journals, reports...)	The Elements of Computing Systems, second edition Building a Modern Computer from First Principles 2 Edition, 2021
Electronic References, Websites	

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Course Objectives	<ol style="list-style-type: none"> 1. To empower students with a comprehensive understanding of statistical measurements, data representation, and dispersion measures. 2. To instill a foundational understanding of probability theory, and foster comprehension of moments and their applications in describing data characteristics. 3. To develop students' understanding of random variables, both discrete and continuous, and key probability distributions, enhancing their ability to model and analyze statistical data. 4. To facilitate the learning of expectations and transformations of random variables, as well as the impact of these transformations on the resulting statistical characteristics. 5. To enable students to comprehend the principles of information theory, including concepts of entropy, mutual information, and channel capacity in both discrete and continuous scenarios. 1. To familiarize students with various channel models, coding techniques, and key theorems such as the Shannon-Hartley theorem, equipping them with necessary tools for efficient information transmission and error management. 																																																																																																																																																																																																				
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Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A2,B2,C2	Elements of Communication System, Transmission System Types, Classification of Signals, Some important signals, Signal spectrum, Spectrum of periodic signals, Spectrum of non-periodic signals	Theoretical, Lab	Lab
2	5	A2,B2,C2	Properties of Fourier Transform, Linear Time Invariant (LTI) System	Theoretical, Lab	Quiz I, Lab
3	5	A2,B2,C2	Modulation, Double-Side-Band Suppressed Carrier, Double-Side-Band with Large Carrier, Sideband and Carrier Powers, Single-sideband, suppressed carrier,	Theoretical, Lab	Lab
4	5	A2,B2,C2	Generation of SSB Signals, Demodulation of SSB Signals, Vestigial – sideband, Frequency Division Multiplexing, Commercial AM Broadcast Transmitters, Noise in AM Systems	Theoretical, Lab	Test I, Lab
5	5	A2,B2,C2	Generalized Concept of Angle Modulation, Power of an Angle-Modulated Wave,	Theoretical, Lab	Lab

			Bandwidth of the Angle modulation waves		
6	5	A2,B2,C2	Single Tone FM, Demodulation of FM Signals, Noise in Angle Modulated signals	Theoretical, Lab	Quiz II, Lab
7	5	A2,B2,C2	Elements of Digital Communication System, Digital vs. Analog Communications, Noise immunity of digital signals, Interface of Analog and Digital Systems, 5.SNR, Bandwidth and Channel capacity, Advantages of Digital Communication System.	Theoretical, Lab	Lab
8	5	A2,B2,C2	Probability, Joint Probability, Conditional Probability, Statistical Independence, Random Variables, Measure of Information, Self-Information, Source Entropy, Source Entropy Rate, Source Efficiency and Redundancy, Mutual Information,	Theoretical, Lab	Test I, Lab
9	5	A2,B2,C2	Transinformation (average mutual information), Marginal Entropies, Joint and conditional entropies,	Theoretical, Lab	Lab
10	5	A2,B2,C2	Ternary symmetric channel TSC, Other Special Channels, Venn Diagram Representations of Entropies	Theoretical, Lab	Lab
11	5	A2,B2,C2	Channel capacity, Channel capacity of discrete symmetric	Theoretical, Lab	Lab

			channels, Channel efficiency and redundancy,		
12	5	A2,B2,C2	Channel Capacity of Nonsymmetric Channels, Entropies of continuous signals,	Theoretical, Lab	Assignments, Lab
13	5	A2,B2,C2	Channel capacity of continuous Gaussian channel,	Theoretical, Lab	Lab
14	5	A2,B2,C2	Entropy of Gaussian noise, Channel capacity of Gaussian channels.	Theoretical, Lab	Seminar, Lab
15	5	A2,B2,C2	Source Coding, Coding efficiency and redundancy, Source Coding Methods, Source Extension,	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	- F. Alajaji, P.N.Chen "An Introduction to single user information theory", Springer ,2018. - U. Madhow , " Introduction to Communication Systems",University of California, 2014
Main references (sources)	Modern Digital And Analog Communications Systems,3rd edition, B.P.Lathi, Oxford university press, 1998.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

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Course Objectives	<ol style="list-style-type: none">1. Learn the principles of using HTML5, CSS2. Learn how the web site works3. Learn the relationship between HTML and CSS4. . Know the basics of using PHP programming language .5. 2. Know how to use PHP to store data in databases.6. 3. Know how to connect PHP with MySQL Database.7. 4. Know the basic commands of MySQL																																																																																																																																				
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Strategy	<p>The main strategy in this course is to encourage students to participate in creating web application in real time environment in the lab as well as creating mini application in groups of two students, using HTML5 and CSS.</p> <p>And also encourage students to Design website using web languages by PHP with MySQL database to store and retrieve data.</p> <p>several strategies can be employed to enhance student learning and engagement. One effective strategy is to adopt a project-based learning approach, where students actively work on hands-on development projects throughout the course. By tackling real-world mobile app projects, either individually or in teams, students can apply their knowledge and skills in a practical setting. Providing</p>																																																																																																																																				

guidance, feedback, and regular milestones ensures that students make progress and achieve the desired learning outcomes.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A2,B2,C2	Introduction to Web Programming and HTML.	Theoretical, Lab	Lab
2	5	A2,B2,C2	HTML Images, Links, Table and Forms.	Theoretical, Lab	Quiz I, Lab
3	5	A2,B2,C2	Cascading Style sheets (CSS), CSS Syntax, CSS Selectors, and CSS Declaration.	Theoretical, Lab	Lab
4	5	A2,B2,C2	Styling Links, Styling Tables, HTML Lists and CSS List Properties.	Theoretical, Lab	Test I, Lab
5	5	A2,B2,C2	Block Elements, Inline Elements and Styling Forms.	Theoretical, Lab	Lab
6	5	A2,B2,C2	SQL	Theoretical, Lab	Quiz II, Lab
7	5	A2,B2,C2	Introduction: Learning PHP & MySQL place in the world of development, Components of a PHP application, & requesting data from a webpage	Theoretical, Lab	Lab
8	5	A2,B2,C2	Exploring PHP : form handling using PHP, getting variables, simple examples	Theoretical, Lab	Test I, Lab
9	5	A2,B2,C2	WAMP principles: explaining the main differences between server side and client side scripting languages	Theoretical, Lab	Lab
10	5	A2,B2,C2	MySQL : MySQL Database, Managing the Database, Using	Theoretical, Lab	Lab

			phpMyAdmin, Database Concepts, & Structured Query Language		
11	5	A2,B2,C2	PHP & MySQL interaction : The Process, Querying the Database with PHP Functions	Theoretical, Lab	Lab
12	5	A2,B2,C2	PHP session	Theoretical, Lab	Assignments, Lab
13	5	A2,B2,C2	PHP cookie	Theoretical, Lab	Lab
14	5	A2,B2,C2	PHP form validation & SQL injection	Theoretical, Lab	Seminar, Lab
15	5	A2,B2,C2	Introducing non-coded programs to design and implement web applications	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6

Lab: 14

Mid-terms Exam: 20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	HTML & CSS Design and Build Websites PHP5 & MySQL5 from novice to professional Author : W. Jason Gilmore
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

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Course Objectives	The aim of the course is to <ol style="list-style-type: none"> 1. Introduce the basic principles, techniques, and applications of digital signal processing and to motivate and prepare students to apply them using software tools. 2. Determine the output and the impulse response of DT system for recursive and non-recursive systems. 3. Measure the power spectrum of DT Fourier transform. 4. Give the students the required knowledge for DFT, DIT-FFT, DIF-FFT, Z Transforms and inverse Z transform. 5. Explore the data communication systems and teach students to digital filters. 																																																																																																																																																																																																																																																																																			
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Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, laboratory and by considering the type of simple experiments involving some sampling activities that are interesting to the students.																																																																																																																																																																																																																																																																																			
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1,A4,B1	introduction signals, systems, and signal processing, classification of signals, the concept of frequency in continuous-time and discrete-time signals, analog-to-digital and digital-to-analog conversion.	Theoretical, Lab	Lab
2	4	A1,A4,B1	discrete-time signals and systems discrete-time signals, discrete-time systems, analysis of discrete-time linear time-invariant systems, discrete-time systems described by difference equations, implementation of discrete-time systems, correlation of discrete-time signals,	Theoretical, Lab	Quiz I, Lab
3	4	A1,A4,B1	the z-transform and its application to the analysis of lti systems the z-transform, rational z-transforms, inversion of the z-transform, the one-sided z-transform, analysis of linear time-invariant systems in the z-domain,	Theoretical, Lab	Lab
4	4	A1,A4,B1	frequency analysis of signals and systems frequency analysis of continuous-time signals, frequency analysis of discrete-time signals, properties of the fourier transform for discrete-time signals, linear time-invariant systems as frequency-selective filters, inverse systems and deconvolution	Theoretical, Lab	Test I, Lab
5	4	A1,A4,B1	the discrete fourier transform: its properties and applications frequency domain sampling: the discrete fourier transform, properties of the dft, linear filtering methods based on the dft, frequency analysis of signals using the dft.	Theoretical, Lab	Lab

6	4	A1,A4,B1	efficient computation of the dft: fast fourier transform algorithms efficient computation of the dft: fft algorithms, applications of fft algorithms, a linear filtering approach to computation of the dft, quantization effects in the computation of the dft.	Theoreti cal, Lab	Quiz II, Lab
7	4	A1,A4,B1	efficient computation of the dft: fast fourier transform algorithms efficient computation of the dft: fft algorithms, applications of fft algorithms, a linear filtering approach to computation of the dft, quantization effects in the computation of the dft.	Theoreti cal, Lab	Lab
8	4	A1,A4,B1	discrete hilbert transform real and imaginary parts sufficiency of the fourier transform for causal sequences, sufficiency theorem for finite-length sequences, relationship between magnitude and phase, hilbert transform relations for complex sequences.	Theoreti cal, Lab	Test I, Lab
9	4	A1,A4,B1	discrete hilbert transform real and imaginary parts sufficiency of the fourier transform for causal sequences, sufficiency theorem for finite-length sequences, relationship between magnitude and phase, hilbert transform relations for complex sequences.	Theoreti cal, Lab	Lab
10	4	A1,A4,B1	design of digital filters design of fir filters, design of iir filters from analog filters, frequency transformations, design of digital filters based on least-squares method	Theoreti cal, Lab	Lab
11	4	A1,A4,B1	design of digital filters design of fir filters, design of iir filters from analog filters, frequency transformations, design of digital filters based on least-squares method	Theoreti cal, Lab	Lab
12	4	A1,A4,B1	adaptive filters application of adaptive filters, the lms algorithm, rls algorithm, adaptive lattice ladder filters.	Theoreti cal, Lab	Assign ments , Lab
13	4	A1,A4,B1	adaptive filters application of adaptive filters, the lms	Theoreti cal, Lab	Lab

			algorithm, rls algorithm, adaptive lattice ladder filters.		
14	4	A1,A4,B1	power spectrum estimation of spectra from finite duration observation of signals, nonparametric method for power spectrum estimation, parametric method for power spectrum estimation,	Theoretical, Lab	Seminar, Lab
15	4	A1,A4,B1	power spectrum estimation of spectra from finite duration observation of signals, nonparametric method for power spectrum estimation, parametric method for power spectrum estimation,	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	fundamentals of signals and systems, benoit boulet, charles river media boston, massachusetts 2006
Main references (sources)	digital signal processing, a practical approach - digital signal processing, by john g. proakis, dimitris g. manolakis, 5th edition 2021.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Third Year

Second semester

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. Provide students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary. 2. To understand sentences, tenses, and practicing writing. 3. This module works towards enhancing students' English language competencies along with their technical or professional knowledge. 4. Enhancing students' communication skills in English can result in better job opportunities in the future 																																																																																																																																																																																																																																																																																																												
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Strategy	<p>The main strategies that will be adopted in delivering this module are:</p> <ul style="list-style-type: none"> - Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. - Use didactic questioning through questions to determine student understanding of the material. <p>Writing an assignment and report that encourages students to clarify and organize their thinking and independently research and present on a topic.</p>																																																																																																																																																																																																																																																																																																												
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	C3,C4	Clauses , Adjective Clauses	Theoretical	
2	2	C3,C4	Coordinating Conjunctions Adverb Clauses	Theoretical	Quiz I
3	2	C3,C4	the z-transform and its application to the analysis of lti systems the z-transform, rational z-transforms, inversion of the z-transform, the one-sided z-transform, analysis of linear time-invariant systems in the z-domain,	Theoretical	
4	2	C3,C4	Gerunds And Infinitives	Theoretical	Test I
5	2	C3,C4	Reduction Of Adverb Clauses To Modifying Adverbial Phrases	Theoretical	
6	2	C3,C4	Reduction Of Adverb Clauses To Modifying Adverbial Phrases	Theoretical	Quiz II
7	2	C3,C4	Connectives That Express Cause And Effect, Contrast	Theoretical	
8	2	C3,C4	Connectives That Express Cause And Effect, Contrast	Theoretical	Test I
9	2	C3,C4	Conditional Sentences And Wishes	Theoretical	
10	2	C3,C4	Conditional Sentences And Wishes	Theoretical	
11	2	C3,C4	Asking Questions: Modal Auxiliaries	Theoretical	
12	2	C3,C4	Asking Questions: Modal Auxiliaries	Theoretical	Assignments

13	2	C3,C4	Writing Thesis	Theoretical	
14	2	C3,C4	Writing Thesis	Theoretical	Seminar
15	2	C3,C4	Writing Thesis	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10

Mid-terms Exam: 30

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New Headway Plus/ Pre-Intermediate, John and Liz Soars, Oxford University Press
Main references (sources)	Understanding and Using English Grammar, 5 th Edition, Betty S. Azar Stacy A. Hagen.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

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Course Objectives	The Objectives of this module is to provide students with essential theory material in image processing and practical experience required in image processing applications. The course introduces 2D image processing system, involving: 2D image formation model, 2D Fourier application, 2D Filter design, Image histogram, noise cleaning, 2D image filters for enhancement and restoration, in spatial and frequency domains. Image segmentation and extraction. The module will contain both theoretical material and practical sessions to demonstrate the fundamental techniques used in image processing.																																																																																																																																																																																																																																																																																																															
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1	4	A2,A3,B3,C1,C2	Electromagnetic Waves and its Application	Theoretical, Lab	Lab
2	4	A2,A3,B3,C1,C2	Structure of the Human Eye	Theoretical, Lab	Quiz I, Lab
3	4	A2,A3,B3,C1,C2	Application of EMW	Theoretical, Lab	Lab
4	4	A2,A3,B3,C1,C2	Introduction to DIP Part 1	Theoretical, Lab	Test I, Lab
5	4	A2,A3,B3,C1,C2	Introduction to DIP Part 2	Theoretical, Lab	Lab
6	4	A2,A3,B3,C1,C2	Weeks 6 - Exam Mid 1	Theoretical, Lab	Quiz II, Lab
7	4	A2,A3,B3,C1,C2	Digital Image Fundamentals Part 1	Theoretical, Lab	Lab
8	4	A2,A3,B3,C1,C2	Digital Image Fundamentals Part 2	Theoretical, Lab	Test I, Lab
9	4	A2,A3,B3,C1,C2	Fourier Transform & Image Formation model	Theoretical, Lab	Lab
10	4	A2,A3,B3,C1,C2	Digital Image Enhancement Part 1	Theoretical, Lab	Lab
11	4	A2,A3,B3,C1,C2	Digital Image Enhancement Part 2	Theoretical, Lab	Lab
12	4	A2,A3,B3,C1,C2	Digital Image Restoration	Theoretical, Lab	Assignments, Lab
13	4	A2,A3,B3,C1,C2	Weeks 13 - Exam Mid 2	Theoretical, Lab	Lab
14	4	A2,A3,B3,C1,C2	Wavelets Transform & Color Image Processing	Theoretical, Lab	Seminar, Lab
15	4	A2,A3,B3,C1,C2	Image Segmentation	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Digital Image Processing By: Rafael C. Gonzalez and Richard E. Woods 3th edition, Pearson Education, Inc., 2008
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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Course Objectives	<ol style="list-style-type: none"> 1. obtain general knowledge about the areas of discrete mathematics and algebra 2. provide an insight into the interactions between the areas of discrete mathematics and the study of modern algebra 3. understand a variety of methods used to construct mathematical proofs 4. acquire an insight into applications such as coding and design. 																																																																																																																																																																																																																	
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Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through theoretical and scientific lectures, in addition to self-learning and obtaining information, whether inside or outside the classroom, and devising ways to obtain information on their own.																																																																																																																																																																																																																	
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1	3	A2,B1,C1,C2	Counting: selections, inclusion-exclusion,	Theoretical																																																																																																																																																																																																														

			partitions and permutations, Stirling numbers, generating functions, recurrence relations.		
2	3	A2,B1,C1,C2	Graph Theory: basic concepts (graph, adjacency matrix, etc.), walks and cycles, trees and forests, colourings	Theoretical	Quiz I
3	3	A2,B1,C1,C2	Set Systems: matching, finite geometries, block designs.	Theoretical	
4	3	A2,B1,C1,C2	Abstract groups: revision of key concepts such as cyclic groups, subgroups, homomorphism's	Theoretical	Test I
5	3	A2,B1,C1,C2	Lagrange's theorem. Conjugation and normal subgroups. Group actions.	Theoretical	
6	3	A2,B1,C1,C2	Applications of algebra to discrete mathematics I: permutations, orbits and stabilisers, the orbit-stabiliser theorem; applications to counting problems.	Theoretical	Quiz II
7	3	A2,B1,C1,C2	Applications of algebra to discrete mathematics I: permutations, orbits and stabilisers, the orbit-stabiliser theorem; applications to counting problems.	Theoretical	
8	3	A2,B1,C1,C2	Rings and polynomials: the Euclidean algorithm for polynomials, integral domains, ideals, factor rings, fields, field extensions.	Theoretical	Test I
9	3	A2,B1,C1,C2	Rings and polynomials: the	Theoretical	

			Euclidean algorithm for polynomials, integral domains, ideals, factor rings, fields, field extensions.		
10	3	A2,B1,C1,C2	Finite fields: construction, the primitive element theorem, and finite linear algebra.	Theoretical	
11	3	A2,B1,C1,C2	Finite fields: construction, the primitive element theorem, and finite linear algebra.	Theoretical	
12	3	A2,B1,C1,C2	Applications of algebra to discrete mathematics II: finite Geometry: designs, affine and projective planes	Theoretical	Assignments
13	3	A2,B1,C1,C2	Applications of algebra to discrete mathematics II: finite Geometry: designs, affine and projective planes	Theoretical	
14	3	A2,B1,C1,C2	Error-correcting codes: linear codes, cyclic codes, perfect codes.	Theoretical	Seminar
15	3	A2,B1,C1,C2	Error-correcting codes: linear codes, cyclic codes, perfect codes.	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10
Mid-terms Exam: 30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Biggs, N. Discrete mathematics. (Oxford: Oxford University Press, 2003) [ISBN 978-0198507178]
Main references (sources)	Cameron, P.J. Introduction to Algebra. (Oxford: Oxford University Press, 2008) second edition

Recommended books and references (scientific journals, reports...)	
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Course Objectives	<ul style="list-style-type: none"> Providing the students with sufficient background and basic principles of digital communication systems. Teaching the students, the scientific procedures of computing the spectrum, power, bandwidth of both useful and noisy signals. Learning the students, the performance measures of communication systems needed to enable them to identify the suitable system for selected application. Acquiring the students, the sufficient skills to design the electronic circuits of selected communication systems transmitters and receivers. <p>Exciting the students to work as teams to solve the engineering problems related communication engineering and describing to them the profession ethics.</p>																																																																																																																																																																								
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A1,B1	Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error,	Theoretical, Lab	Lab
2	5	A1,B1	Companding in PCM systems. Differential PCM systems (DPCM). Time Division Multiplexing & Demultiplexing.	Theoretical, Lab	Quiz I, Lab
3	5	A1,B1	Delta modulation, its draw backs, adaptive delta modulation, comparison of PCM and DM systems,	Theoretical, Lab	Lab
4	5	A1,B1	Noise in PCM and DM systems. Illustrative Problems.	Theoretical, Lab	Test I, Lab
5	5	A1,B1	ASK modulator, Coherent and Non-Coherent ASK detector, FSK modulator, Spectrum of FSK, coherent reception, non-coherent detection of FSK. BPSK transmitter, Coherent reception of BPSK, DPSK, QPSK.	Theoretical, Lab	Lab
6	5	A1,B1	Source of noise, frequency representation of noise, effect of filtering on probability density of Gaussian noise, spectral components of noise, response of a narrow band filter to noise.	Theoretical, Lab	Quiz II, Lab

7	5	A1,B1	Power spectral density of $n(t)$ & $\dot{n}(t)$, probability density of $n(t)$, $\dot{n}(t)$, and their time derivatives, representation of noise using orthonormal coordinates, Irrelevant noise components.	Theoretical, Lab	Lab
8	5	A1,B1	Data transmission, base band signal receiver, probability of error, optimum filter. White noise: the matched filter, probability of error of the matched filter.	Theoretical, Lab	Test I, Lab
9	5	A1,B1	Error probability for QPSK, probability of error of minimum shift keying MSK, comparison of modulation systems.	Theoretical, Lab	Lab
10	5	A1,B1	Spread Spectrum Modulation: direct sequence (DS) spread spectrum, use of spread spectrum with code division	Theoretical, Lab	Lab
11	5	A1,B1	Multiple access CDMA, ranging using DS spread spectrum, frequency hopping (FH) spread spectrum	Theoretical, Lab	Lab
12	5	A1,B1	Generation & ch/s of PN sequences, acquisition (coarse synchronization) of a FH signal, tracking (fine synchronization) of a FH signal, acquisition of a DS signal, tracking of a DS signal.	Theoretical, Lab	Assignments, Lab
13	5	A1,B1	Generation & ch/s of PN sequences, acquisition (coarse synchronization) of a FH signal, tracking (fine synchronization) of a FH signal, acquisition of	Theoretical, Lab	Lab

			a DS signal, tracking of a DS signal		
14	5	A1,B1	Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error,	Theoretical, Lab	Seminar, Lab
15	5	A1,B1	Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error,	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Analog & digital communication systems: Martin S. Roden
Main references (sources)	Principles of Communications Author : Taub & Schilling
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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8. Course Objectives																																																																																																																																									
Course Objectives	<ol style="list-style-type: none"> 1. To develop problem solving skills and understanding of Microprocessors 2. To understand the internal architecture of the Microprocessor 3. The conversion between ASCHII and Binary 4. Programming the Microprocessor using assembly language 5. To understand the modes of the Microprocessors (minimum and maximum) 6. How the interfacing in the Microprocessor works 																																																																																																																																								
9. Teaching and Learning Strategies																																																																																																																																									
Strategy	The main strategy will be adopt in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their thinking skills. This will be achieve through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.																																																																																																																																								
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method																																																																																																																																				

1	4	B3	Introduction to microprocessors	Theoretical, Lab	Lab
2	4	B3	Internal architecture, Microprocessor components	Theoretical, Lab	Quiz I, Lab
3	4	B3	Real mode vs protected mode in the microprocessor, the differences	Theoretical, Lab	Lab
4	4	B3	Programming the microprocessor 8086, and how to convert from aschii to binary	Theoretical, Lab	Test I, Lab
5	4	B3	Programming the microprocessor 8086, and how to convert from aschii to binary	Theoretical, Lab	Lab
6	4	B3	Addressing modes: show the different types of addressing modes that are used in MOV instructions	Theoretical, Lab	Quiz II, Lab
7	4	B3	Addressing modes: show the different types of addressing modes that are used in MOV instructions	Theoretical, Lab	Lab
8	4	B3	Arithmetic operations: ADD, SUB, MUL and their extended operations ADC,SBB, IMUL	Theoretical, Lab	Test I, Lab
9	4	B3	Arithmetic operations: ADD, SUB, MUL and their extended operations ADC,SBB, IMUL	Theoretical, Lab	Lab
10	4	B3	Logic operation in the microprocessor : AND, OR, XOR. NOR and others	Theoretical, Lab	Lab
11	4	B3	Logic operation in the microprocessor : AND, OR, XOR. NOR and others	Theoretical, Lab	Lab
12	4	B3	Jump instruction: conditional and unconditional	Theoretical, Lab	Assignments, Lab
13	4	B3	Subroutine and call functions	Theoretical, Lab	Lab

14	4	B3	Hardware: maximum mode	Theoretical, Lab	Seminar, Lab
15	4	B3	Minimum mode in the hardware devices	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Microprocessor 8086: Architecture, Programming and Interfacing– Mathur S 2011
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1	4	A4,B1,C4	Review of probability Theory, Definition of Information	Theoretical, Lab	Lab
2	4	A4,B1,C4	Review of probability Theory, Definition of Information	Theoretical, Lab	Quiz I, Lab
3	4	A4,B1,C4	Model of information Transmission System, Discrete Source , Entropy Definition	Theoretical, Lab	Lab
4	4	A4,B1,C4	Model of information Transmission System, Discrete Source , Entropy Definition	Theoretical, Lab	Test I, Lab
5	4	A4,B1,C4	Entropy & Its relation to Information Symmetric Channels	Theoretical, Lab	Lab
6	4	A4,B1,C4	Channel Capacity & Efficiency	Theoretical, Lab	Quiz II, Lab
7	4	A4,B1,C4	Continues Source & Channel	Theoretical, Lab	Lab
8	4	A4,B1,C4	Shannon-Hartly Theorem	Theoretical, Lab	Test I, Lab
9	4	A4,B1,C4	Source Coding , Variable & Fixed Length codes	Theoretical, Lab	Lab
10	4	A4,B1,C4	Source Coding , Variable & Fixed Length codes	Theoretical, Lab	Lab
11	4	A4,B1,C4	Data Compression	Theoretical, Lab	Lab
12	4	A4,B1,C4	Data Compression	Theoretical, Lab	Assignments, Lab
13	4	A4,B1,C4	Channel Coding Basic Idea	Theoretical, Lab	Lab
14	4	A4,B1,C4	Error correction & detection	Theoretical, Lab	Seminar, Lab
15	4	A4,B1,C4	Block & Polynomial Codes	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6

Lab: 14

Mid-terms Exam: 20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Essentials of Information Theory, J. C. Mouriará P.G. Farrell, Edition & Year public: 1st, 2006 , Prentice Hall
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Forth Year First semester

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	C3,C4	Course introduction and overview, Morals and ethics, Comparison of ethics and engineering ethics, Ethics at personal and student level	Theoretical	
2	2	C3,C4	The concept of professions: The importance of ethics in science and engineering, The role of codes of ethics, Professional responsibilities of engineers	Theoretical	Quiz I
3	2	C3,C4	The concept of morality: The importance of core values, Moral/ethical dilemmas and hierarchy of moral values, Factors affecting moral responsibility, and degrees of responsibility	Theoretical	
4	2	C3,C4	Overview of ethical theories and applications	Theoretical	Test I
5	2	C3,C4	Basics of ethical analyses and decision-making	Theoretical	
6	2	C3,C4	The importance of intention: Truth (personal and social), The concept of whistleblowing	Theoretical	Quiz II
7	2	C3,C4	Ethical leadership in engineering and society, Conflicts of interests	Theoretical	
8	2	C3,C4	Engineers in organizations: Ethics in the workplace,	Theoretical	Test I

			Fairness (personal and social)		
9	2	C3,C4	Specific case example – Challenger Incident	Theoretical	
10	2	C3,C4	Reliability, risk and safety: Risk management, Resource allocations	Theoretical	
11	2	C3,C4	Ethics in the electronic and digital age, Privacy and confidentiality issue	Theoretical	
12	2	C3,C4	Responsible conduct of research, Intellectual property and society	Theoretical	Assignments
13	2	C3,C4	Ethics and the environment, Innovation and ethics	Theoretical	
14	2	C3,C4	Ethics and the environment, Innovation and ethics	Theoretical	Seminar
15	2	C3,C4	Class summary and closure	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10
 Mid-terms Exam: 30
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Seebauer, E.G. and Barry, R.L.
 “Fundamental of Ethics for Scientists and Engineers”, New York: Oxford University Press, 2001

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites

Course Description Form

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Course Objectives	<ol style="list-style-type: none">1. To develop problem solving skills and understanding of Wireless networks2. To understand the propagation effects on the signals3. Understanding the three domains of signals domains4. What are the multiplexing methods in the wireless communications5. Medium access: how the signal transfer and share the same media without interfering6. Understanding the GSM and its architecture7. Understanding the UMTS8. What is the LTE, MIMO and OFDM9. Understanding the Wireless LAN, access methods and power managements																																																																																																																																																																																																
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A4,B3,B4,C1-C4	Introduction /Wireless transmission : what is the Frequencies used in wireless networks, the Signals three main domains, Antenna pattern	Theoretical, Lab	Lab
2	5	A4,B3,B4,C1-C4	Wireless transmission Signal : signal propagation effects, Multiplexing types, CDM, TDM, FDM, SDM, Modulation: ASK, FSK, PSK	Theoretical, Lab	Quiz I, Lab
3	5	A4,B3,B4,C1-C4	Wireless transmission /Medium Access: Spread spectrum techniques, DSSS, slow and fast FHSS, Cellular systems, frequency planning, frequency reuse	Theoretical, Lab	Lab
4	5	A4,B3,B4,C1-C4	Medium Access: Hidden terminals , exposed terminals, Collision avoidance methods, MACA CDMA, SAMA, ALOHA slotted ALOHA	Theoretical, Lab	Test I, Lab
5	5	A4,B3,B4,C1-C4	Mobile networks-GSM: Overview, gsm Services, GSM advantage and disadvantages, Sub-systems, main components	Theoretical, Lab	Lab
6	5	A4,B3,B4,C1-C4	GSM: GSM architecture: BSS, NSS and OSS/ control channel : broadcast channels, common control channels, dedicated control channels, Mobile originated	Theoretical, Lab	Quiz II, Lab

			call, and terminated call, handover		
7	5	A4,B3,B4,C1-C4	security in GSM: authentication, GSM key generation , GSM encryption / GPRS and its Components, GPRS architecture	Theoretical, Lab	Lab
8	5	A4,B3,B4,C1-C4	UMTS: UMTS (3G) network , Spreading and scrambling of user data, OVSF, UMTS FDD and TDD frame structure, UTRAN architecture	Theoretical, Lab	Test I, Lab
9	5	A4,B3,B4,C1-C4	Handover in 3G networks: soft handover and hard handover , Support of mobility, macro diversity, breathing cell	Theoretical, Lab	Lab
10	5	A4,B3,B4,C1-C4	LTE system, LTE architecture, the main differences between 3G and 4G, voice call types in LTE, MIMO, Resource elements	Theoretical, Lab	Lab
11	5	A4,B3,B4,C1-C4	Wireless LAN: Design goals for wireless LANs, Comparison: infrastructure vs. ad-hoc networks, Access methods DFWMAC-DCF, DFWMAC-DCF w/ RTS/CTS, DFWMAC- PCF	Theoretical, Lab	Lab
12	5	A4,B3,B4,C1-C4	Wireless LAN: Synchronization and beacon in infrastrucred and ad-hoc systems , Power management, and power saving, Roaming	Theoretical, Lab	Assignments, Lab
13	5	A4,B3,B4,C1-C4	Introduction /Wireless transmission : what is the Frequencies used in wireless networks, the Signals three main	Theoretical, Lab	Lab

			domains, Antenna pattern		
14	5	A4,B3,B4,C1-C4	Wireless transmission Signal : signal propagation effects, Multiplexing types, CDM, TDM, FDM, SDM, Modulation: ASK, FSK, PSK	Theoretical, Lab	Seminar, Lab
15	5	A4,B3,B4,C1-C4	Wireless transmission /Medium Access: Spread spectrum techniques, DSSS, slow and fast FHSS, Cellular systems, frequency planning, frequency reuse	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Mobile Communication”, 2nd edition, Addison Wesley Professional; (2004); ISBN 0321123816
Main references (sources)	Mobile Communication”, Addison Wesley Professional; (2020)
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

- Inquiry-Based Teaching: By encouraging students to ask questions and work with one another to solve any problem, which not only motivates them to think more practically but also helps them to become independent learners.
- Implementing Technology in the Classroom: Such as the use of PowerPoint presentations, videos, virtual classrooms, and augmented reality (AR) which not only add liveliness to the classroom but also lead to a more inclusive and effective learning environment that improves inquisitiveness and collaboration between the students and allows educators to compile data on student performance.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1,A4,B1,C2	Computer and Network Security Concepts: Security Objective, OSI Security Architecture, Security Attacks, Mechanisms and Services	Theoretical, Lab	Lab
2	4	A1,A4,B1,C2	Classical Encryption Techniques: Symmetric Cipher Model, Classical Substitution Cipher, Caesar Cipher, Monoalphabetic Cipher	Theoretical, Lab	Quiz I, Lab
3	4	A1,A4,B1,C2	Playfair Cipher, Polyalphabetic Cipher, Vigenere Cipher, Autokey Cipher, Vernam Cipher, One-Time Pad	Theoretical, Lab	Lab
4	4	A1,A4,B1,C2	Transposition Cipher, Rail Fence Cipher, Row Transposition Cipher, Rotor Machines, Steganography	Theoretical, Lab	Test I, Lab
5	4	A1,A4,B1,C2	Block Ciphers and the Data Encryption Standard	Theoretical, Lab	Lab
6	4	A1,A4,B1,C2	Advance Encryption Standard: Encryption, Structure, Substitution Bytes	Theoretical, Lab	Quiz II, Lab

			Transformation, Shift Row Transformation, Mix Columns Transformation, Arithmetic Polynomial Multiplication,		
7	4	A1,A4,B1,C2	Binary Multiplication, Add Round Key Transformation, Key Expansion, Decryption, Implementation Aspects	Theoretical, Lab	Lab
8	4	A1,A4,B1,C2	Block Cipher Operation: Multiple Encryption and Triple DES, ECB Mode, CBC Mode, CFB Mode, OFB Mode, CTR Mode, XTS-AES Mode	Theoretical, Lab	Test I, Lab
9	4	A1,A4,B1,C2	Random Bit Generation: Random Number, Pseudorandom Number, Linear Congruential Generator, Blum Blum Shub Generator,	Theoretical, Lab	Lab
10	4	A1,A4,B1,C2	Stream Cipher Structure and Properties, RC4	Theoretical, Lab	Lab
11	4	A1,A4,B1,C2	Public Key Cryptography: Introduction, Applications, Requirements, Security	Theoretical, Lab	Lab
12	4	A1,A4,B1,C2	RSA Algorithm: Key Setup, Encryption, Decryption, Security	Theoretical, Lab	Assignments, Lab
13	4	A1,A4,B1,C2	Other Public-Key Cryptosystems: Diffie-Hellman Key Exchange	Theoretical, Lab	Lab
14	4	A1,A4,B1,C2	Elgamal Cryptographic System	Theoretical, Lab	Seminar, Lab

15	4	A1,A4,B1,C2	Elgamal Cryptographic System	Theoretical, Lab	Lab
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11. Course Evaluation

Quiz and Assignments: 6

Lab: 14

Mid-terms Exam: 20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Cryptography and Network Security; Principles & Practice, William Stallings 7 th Edition, 2017, Pearson
Main references (sources)	Cryptography and Network Security, Behrouz Forouzan, 2008, McGraw-Hill
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1	4	A2,A4,B1,C4	Introduction to control systems ,Open loop control system, Closed loop control system	Theoretical, Lab	Lab
2	4	A2,A4,B1,C4	Design of control systems	Theoretical, Lab	Quiz I, Lab
3	4	A2,A4,B1,C4	Mathematical Background and Modeling of Dynamic Systems Differential Equation of Physical Systems, Linear Approximation of Physical Systems	Theoretical, Lab	Lab
4	4	A2,A4,B1,C4	laplace Transform / Inverse Laplace Transformation	Theoretical, Lab	Test I, Lab
5	4	A2,A4,B1,C4	The Transfer Function of Linear Systems, Electrical System / Mechanical System / Analogous between Electrical and mechanical System	Theoretical, Lab	Lab
6	4	A2,A4,B1,C4	DC Motor (Derivation of Mathematical model and Transfer Function)	Theoretical, Lab	Quiz II, Lab
7	4	A2,A4,B1,C4	Block Diagram Models, Block Diagram Reduction	Theoretical, Lab	Lab
8	4	A2,A4,B1,C4	Mason's Signal Flow Graph Models	Theoretical, Lab	Test I, Lab
9	4	A2,A4,B1,C4	Characteristics and Performance of Feedback Control System, Test Input Signals , Performance of a First-Order System	Theoretical, Lab	Lab
10	4	A2,A4,B1,C4	Performance of a Second-Order System, The S-plane Root Location and the Transient Response	Theoretical, Lab	Lab

11	4	A2,A4,B1,C4	Sensitivity of Control systems to parameter Variations, Disturbance Signals in Feedback Control System, Steady State Error	Theoretical, Lab	Lab
12	4	A2,A4,B1,C4	The Stability of Linear feedback Systems, The concept of Stability, The Routh-Hurwitz Stability Criterion, The relative Stability of Feedback Control Systems	Theoretical, Lab	Assignments, Lab
13	4	A2,A4,B1,C4	The Root Locus Method, The Root locus Concept, The Root Locus Procedure (Rules for Constructing Root Loci), Special Cases, Root Locus Analysis Of Control Systems	Theoretical, Lab	Lab
14	4	A2,A4,B1,C4	Frequency Response Methods Bode Diagrams Polar Plots Nichols chart	Theoretical, Lab	Seminar, Lab
15	4	A2,A4,B1,C4	Nyquist Criterion	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Katsuhiko Ogata ,Modern Control Engineering, Prentise-Hall, International, 5 th , 2009
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1	4	A1,A4,B1,C4	Introduction to operating system(functions and types), User View, System View, Defining Operating Systems, System Goals, Mainframe Systems, Desktop Systems, Multiprocessor Systems, Distributed Systems, Real-Time Systems, Handheld Systems	Theoretical, Lab	Lab
2	4	A1,A4,B1,C4	Operating-System Structures, Operating System Components, Operating-System Services	Theoretical, Lab	Quiz I, Lab
3	4	A1,A4,B1,C4	Operating-System Structures System Calls, Operating System Structure, Virtual Machines, Java, system design & implementation	Theoretical, Lab	Lab
4	4	A1,A4,B1,C4	Processes: Process Concept, Threads, Process Scheduling, Context Switch	Theoretical, Lab	Test I, Lab
5	4	A1,A4,B1,C4	Processes, Operations on Processes, Cooperating Processes, Interprocess Communication, Communication in Client-Server Systems	Theoretical, Lab	Lab
6	4	A1,A4,B1,C4	Threads, Overview, Multithreading Models, Threading Issues	Theoretical, Lab	Quiz II, Lab
7	4	A1,A4,B1,C4	Cpu Scheduling, Basic Concepts, Scheduling Criteria, Scheduling Algorithms	Theoretical, Lab	Lab

8	4	A1,A4,B1,C4	Cpu Scheduling, Thread Scheduling	Theoretical, Lab	Test I, Lab
9	4	A1,A4,B1,C4	Process Synchronization, Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Deadlocks and Starvation, Classical Synchronization Problems Monitors, Atomic Transactions	Theoretical, Lab	Lab
10	4	A1,A4,B1,C4	Deadlocks, System Model, Deadlock Characterization, Methods for Handling Deadlocks Deadlock Prevention	Theoretical, Lab	Lab
11	4	A1,A4,B1,C4	Deadlocks, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock	Theoretical, Lab	Lab
12	4	A1,A4,B1,C4	Memory Management, Background, Swapping, Contiguous-Memory Allocation	Theoretical, Lab	Assignments, Lab
13	4	A1,A4,B1,C4	Memory Management, Paging	Theoretical, Lab	Lab
14	4	A1,A4,B1,C4	Memory Management, Segmentation, Segmentation with Paging	Theoretical, Lab	Seminar, Lab
15	4	A1,A4,B1,C4	Memory Management, Segmentation, Segmentation with Paging	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6

Lab: 14

Mid-terms Exam: 20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text book: Operating system concepts, Author: Abraham Silberschatz, Peter B. Galvin , Greg Gagne, Edition & year public: 8th edition, Addison-Wesely, 2008
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Forth Year

Second semester

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A4, C1-C4	An Approach to Academic Writing	Theoretical	
2	2	A4, C1-C4	General-Specific and Specific-General Texts	Theoretical	Quiz I
3	2	A4, C1-C4	Problem, Process, and Solution	Theoretical	
4	2	A4, C1-C4	Abstract	Theoretical	Test I
5	2	A4, C1-C4	Paraphrasing	Theoretical	
6	2	A4, C1-C4	Research Report	Theoretical	Quiz II
7	2	A4, C1-C4	Research Proposal	Theoretical	
8	2	A4, C1-C4	MID EXAM I	Theoretical	Test I
9	2	A4, C1-C4	Writing Summaries	Theoretical	
10	2	A4, C1-C4	Results and conclusions	Theoretical	
11	2	A4, C1-C4	Annotated Bibliography	Theoretical	
12	2	A4, C1-C4	Various Disciplines and Topics: Personal statements, scientific reports, discussion board postings, in-class essays, literature reviews, business genres, PowerPoint presentations, personal statements, and introductions and conclusions	Theoretical	Assignments
13	2	A4, C1-C4	Presentation slides	Theoretical	
14	2	A4, C1-C4	Presentation slides	Theoretical	Seminar
15	2	A4, C1-C4	Presentation slides	Theoretical	

11. Course Evaluation

Quiz and Assignments: 10
 Mid-terms Exam: 30
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New Headway Plus/ Pre-Intermediate, John and Liz Soars, Oxford University Press
Main references (sources)	Understanding and Using English Grammar, 5 th Edition, Betty S. Azar Stacy A. Hagen.

Recommended books and references (scientific journals, reports...)	
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Electronic References, Websites	
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	A1, B1mB2	Introduction to Data Warehousing: introduction, evolution of data warehousing, data warehousing concepts, example of typical data warehouse queries, benefits of DW	Theoretical	
2	3	A1, B1mB2	Operational Database Systems and Data Warehouse (OLTP & OLAP), Data Marts, Metadata.	Theoretical	Quiz I
3	3	A1, B1mB2	Data webhouse, clickstream, OLTP, comparison of OLTP & DW	Theoretical	
4	3	A1, B1mB2	Data warehousing: multidimensional modeling, cubes, facts, dimensions, DW design, Data warehousing: more about dimensions, star scheme, snowflake scheme, DW implementation, DW applications	Theoretical	Test I
5	3	A1, B1mB2	The basic lifecycle of a DW: Analysis and requirements definition, Conceptual design, logical design, implementation	Theoretical	
6	3	A1, B1mB2	Architecture of DW: introduction, typical architecture of DW, typical DW & data mart architecture, reasons for creating a data mart	Theoretical	Quiz II
7	3	A1, B1mB2	Data warehouse physical design	Theoretical	

8	3	A1, B1mB2	Partitioning, indexing, integrity constraints and materialized views	Theoretical	Test I
9	3	A1, B1mB2	Extract-Transform-Load: ETL process, building dimensions and fact tables, extract, transform, load, important criteria in selecting ETL tool	Theoretical	
10	3	A1, B1mB2	Introduction to Data Mining: Definitions & Motivations, Data to be Mined, Knowledge to be discovered, Techniques Utilized, Applications Adapted, Major Issues in Data Mining	Theoretical	
11	3	A1, B1mB2	Introduction to Data Mining: Definitions & Motivations, Data to be Mined, Knowledge to be discovered, Techniques Utilized, Applications Adapted, Major Issues in Data Mining	Theoretical	
12	3	A1, B1mB2	Data mining approaches and tools(Data Mining Technique): associations, sequences	Theoretical	Assignments
13	3	A1, B1mB2	Data mining approaches and tools(Data Mining Technique): classifications, clusters, and forecasts	Theoretical	
14	3	A1, B1mB2	Introduction to Business Intelligence: Business intelligence design and development, BI Trends	Theoretical	Seminar

15	3	A1, B1mB2	Intelligent systems techniques for DW & DM, Web Mining	Theoretical	
11. Course Evaluation					
Quiz and Assignments: 10 Mid-terms Exam: 30 Final Exam: 60					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Title: Building the Data Warehouse Author : W.H. Inmon, Claudia Imhoff, Ryan Sousa Edition & Publication year: 4th Wiley. ISBN 978-0-7645-9944-6 , October 2005		
Main references (sources)			Title : The Data Warehouse Toolkit Author : Ralph Kimball, Margy Ross Edition & Publication year: 2 nd John Wiley & Sons, January 2008 Title: The Data Warehouse Lifecycle Toolkit Author : Ralph Kimball, Margy Ross Edition & Publication year: 2 nd Wiley, January 2008		
Recommended books and references (scientific journals, reports...)			Title: The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling Author : Ralph Kimball, Margy Ross Edition & Publication year: 3 rd Wiley , July 2013		
Electronic References, Websites					

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A4,B1,C4	Artificial Intelligence: Roots & History	Theoretical, Lab	Lab
2	5	A4,B1,C4	AI as Representation and search	Theoretical, Lab	Quiz I, Lab
3	5	A4,B1,C4	Structures and strategies for state space search	Theoretical, Lab	Lab
4	5	A4,B1,C4	Heuristic search	Theoretical, Lab	Test I, Lab
5	5	A4,B1,C4	Control and implementation of state space search	Theoretical, Lab	Lab
6	5	A4,B1,C4	Knowledge Intensive Problem solving	Theoretical, Lab	Quiz II, Lab
7	5	A4,B1,C4	Reasoning with or uncertain incomplete information	Theoretical, Lab	Lab
8	5	A4,B1,C4	Knowledge representation	Theoretical, Lab	Test I, Lab
9	5	A4,B1,C4	Languages and programming Techniques for AI	Theoretical, Lab	Lab
10	5	A4,B1,C4	Prolog	Theoretical, Lab	Lab
11	5	A4,B1,C4	Understanding Natural Language	Theoretical, Lab	Lab
12	5	A4,B1,C4	Automated Reasoning	Theoretical, Lab	Assignments, Lab
13	5	A4,B1,C4	Machine Learning : symbol-based	Theoretical, Lab	Lab
14	5	A4,B1,C4	Genetic Algorithms	Theoretical, Lab	Seminar, Lab
15	5	A4,B1,C4	Neural Network	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6

Lab: 14

Mid-terms Exam: 20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text book: Artificial Intelligence structures and strategies for complex problem solving, Author : George F. Luger Edition & Year published : 6 th Editio 2008.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

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Course Objectives	<p>The aim of the course is to</p> <ol style="list-style-type: none"> 1. Introduce the students to multimedia terms and system components 2. Give the students some knowledge in speech production model and speech encoders standards 3. Explain the main concept of standards used in compressing an audio file. 4. Give detailed description to the image compression standards. 5. Describe the different modes on compressing video in MPEG standard 																																																																																																																																																																																																																																																																																																																
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Strategy	<p>The main strategy will be adopt in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their thinking skills. This will be achieve through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.</p>																																																																																																																																																																																																																																																																																																																
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Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method																																																																																																																																																																																																																																																																																																												

1	4	A2,A4,B1,C4	Introduction to Multimedia, Components of Multimedia	Theoretical, Lab	Lab
2	4	A2,A4,B1,C4	Graphics and Image Data Representations: Graphics/Image Data Types, Popular File Formats	Theoretical, Lab	Quiz I, Lab
3	4	A2,A4,B1,C4	Color Models in Images, Color Models in Video	Theoretical, Lab	Lab
4	4	A2,A4,B1,C4	Fundamental Concepts in Video: Types of Video Signals, Analog Video, Digital Video	Theoretical, Lab	Test I, Lab
5	4	A2,A4,B1,C4	Basics of Digital Audio: Digitization of Sound, MIDI: Musical Instrument Digital Interface, Quantization and Transmission of Audio	Theoretical, Lab	Lab
6	4	A2,A4,B1,C4	Multimedia Data Compression: Lossless Compression Algorithms	Theoretical, Lab	Quiz II, Lab
7	4	A2,A4,B1,C4	Multimedia Data Compression: Lossy Compression Algorithms	Theoretical, Lab	Lab
8	4	A2,A4,B1,C4	Image Compression Standards: JPEG Standard, JPEG2000 Standard, JPEG-LS Standard, Bilevel Image Compression Standards	Theoretical, Lab	Test I, Lab
9	4	A2,A4,B1,C4	Basic Video Compression Techniques: Introduction to Video Compression, Search for Motion Vectors	Theoretical, Lab	Lab
10	4	A2,A4,B1,C4	MPEG Video Coding	Theoretical, Lab	Lab

11	4	A2,A4,B1,C4	Basic Audio Compression Techniques: ADPCM in Speech Coding, G.726 ADPCM, Vocoders, MPEG Audio Compression	Theoretical, Lab	Lab
12	4	A2,A4,B1,C4	Introduction to Computing Systems	Theoretical, Lab	Assignments, Lab
13	4	A2,A4,B1,C4	Parallel Computing Technology, Grid and Cloud Computing Tech.	Theoretical, Lab	Lab
14	4	A2,A4,B1,C4	Quality of Multimedia Data Transmission	Theoretical, Lab	Seminar, Lab
15	4	A2,A4,B1,C4	Quality of Multimedia Data Transmission	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6
 Lab: 14
 Mid-terms Exam: 20
 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fundamentals of Multimedia ,Author: Ze-Nian and Drew, Mark S. Li ,Edition & Year public : 2004, Publisher: Pearson Higher Education
Main references (sources)	Multimedia Systems,,Author: Parag Havalad& Gerard Medio , Edition & Year public : 1 st , 2009,Publisher: Course Technology,
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A1,A4,B1,C4	Introduction to basic network components	Theoretical, Lab	Lab
2	5	A1,A4,B1,C4	Network topology: bus , ring, star, cabling media	Theoretical, Lab	Quiz I, Lab
3	5	A1,A4,B1,C4	Basic network hardware, medium access control and methods	Theoretical, Lab	Lab
4	5	A1,A4,B1,C4	LAN architecture	Theoretical, Lab	Test I, Lab
5	5	A1,A4,B1,C4	OSI layers, Physical layer and data link layer	Theoretical, Lab	Lab
6	5	A1,A4,B1,C4	Network layer and IP routing, transport layer, session layer, presentation layer, application layer	Theoretical, Lab	Quiz II, Lab
7	5	A1,A4,B1,C4	IP addressing, address mapping, physical vs logical address	Theoretical, Lab	Lab
8	5	A1,A4,B1,C4	Routing protocols and methos, flooding	Theoretical, Lab	Test I, Lab

			and distance vector		
9	5	A1,A4,B1,C4	Link state method, RIPv1	Theoretical, Lab	Lab
10	5	A1,A4,B1,C4	RIPv2	Theoretical, Lab	Lab
11	5	A1,A4,B1,C4	OSPF and BGP	Theoretical, Lab	Lab
12	5	A1,A4,B1,C4	IGRP and EIGRP	Theoretical, Lab	Assignments, Lab
13	5	A1,A4,B1,C4	Routing in wireless network	Theoretical, Lab	Lab
14	5	A1,A4,B1,C4	Introduction to basic network components	Theoretical, Lab	Seminar, Lab
15	5	A1,A4,B1,C4	Network topology: bus , ring, star, cabling media	Theoretical, Lab	Lab

11. Course Evaluation

Quiz and Assignments: 6

Lab: 14

Mid-terms Exam: 20

Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Larry L. Peterson and Bruce S. Davie, “Computer Networks a Systems Approach”, 5 th edition, 2011.
Main references (sources)	Ravi Malhotra, “IP routing”, 1 st edition, O’Reilly & Associates
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.netacad.com/courses/networking