Course Specification

Course Code: ECE 4101 **Course Title:** Electronic Measurements & Testing 3

1. Basic information

Program Title	Electronics and Communication Engineering.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE 4101			
Prerequisite	----			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Prerequired Course	**----**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	0	0	4	4

2. Course Aims

No.	Aim
1	Design and conduct experiments as well as analyze and interpret data. Work effectively within multi-disciplinary teams in the experiments of: Fiber optics transmission and receiver systems, PSK/QPSK modulation/demodulation experiment. (AM4)

3. Learning Outcomes (LOs)

CLO.31	Use the appropriate tools and equipment to measure system performance
CLO.32	analyze the system performance's results correctly

4. Course Contents

Topics	Week
Explain Light and fiber optics interaction Experiment	1
Light and fiber optics interaction Experiment	2
Explain Fiber optics transmitter Experiment	3
Fiber optics transmitter Experiment	4
Explain Fiber optics Receiver Experiment	5
Fiber optics Receiver Experiment	6
Midterm Exam	7
Explain PSK data transmission Experiment, and PSK/QPSK data transmission Experiment	8
Explain QPSK data transmission Experiment	9
PSK data transmission Experiment	10
Explain Microwave power measurement Experiment	11
Microwave power measurement Experiment	12
Explain Gun Oscillator Experiment, and Gun Oscillator Experiment	13
Practice Test	14
Final Exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.31			√									√
CLO.32			√									√

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Written exam	CLO.32
2	Quizzes and reports	
3	Oral exams	CLO.31, CLO.32
4	Practical	CLO.31, CLO.32
5	Project applied on a practical field problem	
6	Presentation	
7	Assignments	
8	Researches	
9	Self-Learning	
10	Simulations	

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	
4	Mid-term Exam	
5	Oral/ Practical Exam	14
6	Final Exam	15

	Assessment Method	**Weights%**	**Weights**
Practical / Oral	Practical Attendance	20%	20
	Quiz 1 / Quiz 2	10%	10
	Final oral / practical exam	30%	30
Final Exam		40%	40
Total		100%	100

8. List of References

[1] Laboratory manual.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Data show

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Explain Light and fiber optics interaction Experiment	1	CLO.31
2	Light and fiber optics interaction Experiment	1	CLO.31
3	Explain Fiber optics transmitter Experiment	1	CLO.31
4	Fiber optics transmitter Experiment	1	CLO.31
5	Explain Fiber optics Receiver Experiment	1	CLO.31
6	Fiber optics Receiver Experiment	1	CLO.31
7	Midterm Exam	1	CLO.31
8	Explain PSK data transmission Experiment, and PSK/QPSK data transmission Experiment	1	CLO.31
9	Explain QPSK data transmission Experiment	1	CLO.31
10	PSK data transmission Experiment	1	CLO.31
11	Explain Microwave power measurement Experiment	1	CLO.31, CLO.32
12	Microwave power measurement Experiment	1	CLO.31, CLO.32
13	Explain Gun Oscillator Experiment, and Gun Oscillator Experiment	1	CLO.31
14	Practice Test	1	CLO.31, CLO.32
15	Final Exam		

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PL18	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions for Fiber Optics systems, and PSK/QSK Communication systems.	CL.31	Use the appropriate tools and equipment to measure system performance
PL18	Use the appropriate tools and equipment to measure fiber optics system performance, PSK/QPSK and analyze the results correctly.	CLO.32	analyze the system performance's results correctly

Title	Name	Signature
Course coordinator	**Dr. Osama Elmowafy**	
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16 /9/2024**	

Course Specification

Course Code: ECE 4102 **Course Title: Microwave Electronic Engineering**

12. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	**ECE 4102**			
Prerequisite	**ECE 3103**			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

13. Course Aims

No.	Aim
1	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)
2	Dealing and characterization of electronic circuits.(AM5)

14. Course Learning Outcomes (LOs)

CLO20	Design an electronic system for a specific application.
CLO22	Analyze an electronic system for a specific application.
CLO25	Estimate the performance of an electrical system and circuit under specific input excitation and evaluate its suitability for a specific application

15. Course Contents

No.	Topics	Week
1	Transmission waveguides	1
2	Microwave resonator	2
3	Directional coupler	3
4	Microwave network analysis	4
5	Impedance matching and tuning	5
6	Travelling wave tube amplifier	6
7	Mid Term Exam	7
8	Klystron Amplifier	8
9	Reflax Klystron Oscilitor	9
10	Tunnel Diode	10
11	Gunn Diode.	11
12	Shoktty Doiode	12
13	Revision	13
14	Practical exam	14
15	Final exam	15

16. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO20	√	√			√						√	√
CLO22	√	√			√						√	√
CLO25	√	√								√	√	√

17. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√

18. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Written exam	CLO22,CLO20,CLO25
2	Sheets(Assignments)	CLO22,CLO20
3	Quiz	CLO22,CLO20

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	Weekly
2	Reports / Sheets	6-10
3	Quiz	13
4	Mid-term Exam	7
5	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	**Weights%**	**Weights**	**Weights%**	**Weights**
Teacher Opinion		40%	40		
	Sheets(Assignments)			5%	5
	Quiz			5%	5
	Mid-term exam			30%	30
Final Exam				60%	60
Total				100%	100

19. List of References

[1] D. M. Pozar; Microwave Engineering, 3rd Ed.; John Wiley & Sons Inc.
[2] Lehpamer, H; Microwave Transmission Network; McGraw-Hill Professional,2010
[3] Cameron, Richard J and Kudsia, Chandra M and Mansour; Microwave filters for communication systems; John Wiley \& Sons
[4] Merill Skolnik; Introduction to Radar Systems, 3rd Edition; Tata McGraw Hill
[5] East, Peter W; Microwave System Design Tools and EW Applications; Artech House;2008
[6] Saber. M. Aly, Microwave Engineering, 2015.
[7] Micheal steer, Microwave and RF Design Transmission Lines, NC State University,2019

20. Facilities required for teaching and learning

Lecture/Classroom
White board
Data show

21. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Transmission waveguides	2	CLO22, CLO20
2	Microwave resonator	2	CLO22, CLO20
3	Directional coupler	2	CLO22, CLO20
4	Microwave network analysis	2	CLO22,CLO25
5	Impedance matching and tuning	2	CLO22, CLO20
6	Travelling wave tube amplifier	1	CLO22, CLO20
7	Mid Term Exam	2,1	CLO22, CLO20
8	Klystron Amplifier	1	CLO22, CLO20
9	Reflax Klystron Oscilitor	1	CLO22, CLO20
10	Tunnel Diode	1	CLO22,CLO25
11	Gunn Diode.	1	CLO22,CLO25
12	Shoktty Doiode	1	CLO22,CLO25
13	Revision	1	CLO22,CLO25, CLO20
14	Practical exam		
15	Final exam		

22. Matrix of Program LOs with Course Los

Program Los		Course Los	
PL12	Design model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO22	Analyze an electronic system for a specific application.
		CLO20	Design an electronic system for a specific application.
PL14	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	CLO.25	Estimate the performance of an electrical system and circuit under specific input excitation and evaluate its suitability for a specific application.

Title	Name	Signature
Course coordinator	**Assoc. prof. Ahmed Fawzy**	

Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE4103 **Course Title:** Communication system (3)

1. Basic information

Program Title	Electronics and Communication Engineering,
Department offering the program	Electronics and Communication Engineering Depart.
Department offering the course	Electronics and Communication Engineering Depart.
Course Code	ECE4103

Prerequisite	ECE3201			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

2. Course Aims

No.	Aim
1	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques (AM.3)

3. Learning Outcomes (LOs)

CLO.25	Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application

4. Course content

Topics	Week
Basic principles review of signal and systems,	1
convolution theory fundamental and calculation	2
Orthogonality principle and orthonormal basis set, design of orthogonal codes	3
Elements of a digital communication system, optimum receiver design for communication systems	4
Matched filter and coherent detector design	5
Description of binary ASK, FSK, PSK digital modulation techniques	6
Midterm exam	7
M-arry signaling schemes quadrature phase shift keying technique (QPSK)	8
Minimum shift keying (MSK) and differential phase shift keying (DQPSK).	9
Comparison of digital modulation schemes from band width and power efficiency requirements	10
Power spectral density and energy spectral density Calculation, and Auto correlation functions calculation for different modulation techniques	11
Random processes, definition and notation, wide sense stationarity (WSS) and time averages and ergodicity terminology	12
Bit error rate performance for different modulation techniques.	13
Revision	14
Final Exam	15

5. Teaching and Learning methods

Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Researchreports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.25	√	√										

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports / Sheets	CLO.25
3	Quizzes	CLO.25
4	Mid-term Exam	CLO.25
5	Final Exam	CLO25

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	11.13
3	Quizzes	4,10
4	Mid-term Exam	7
5	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	15%	
	Quiz 1 / Quiz 2			5%	
	Mid-term exam			20%	
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam				60%	
Total				100%	

8. List of References

- B.P. Lathi, Modern Digital and Analog communication systems, 2018.
- LEON W. COUCH II, Digital and Analog Communication systems, 2017

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Basic principles review of signal and systems,	1	CLO.25
2	convolution theory fundamental and calculation	1	CLO.25
3	Orthogonality principle and orthonormal basis set, design of orthogonal codes	1	CLO.25
4	Elements of a digital communication system, optimum receiver design for communication systems	1	CLO.25
5	Matched filter and coherent detector design	1	CLO.25
6	Description of binary ASK, FSK, PSK digital modulation techniques	1	ClO.25
8	M-arry signaling schemes quadrature phase shift keying technique (QPSK)	1	CLO.25
9	Minimum shift keying (MSK) and differential phase shift keying (DQPSK).	1	CLO.25
10	Comparison of digital modulation schemes from band width and power efficiency requirements	1	CLO.25
11	Power spectral density and energy spectral density Calculation, and Auto correlation functions calculation for different modulation techniques	1	CLO.25
12	Random processes, definition and notation, wide sense stationarity (WSS) and timeaverages and ergodicity terminology	1	CLO.25
13	Bit error rate performance for different modulation techniques.	1	CLO.25
14	Revision	1	CLO.25
15	Final Exam		

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PLO.14	Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application	CLO.25	Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application

Title	Name	Signature
Course coordinator	**Dr. Osama Elmowafy**	
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/9/2024**	

Course Specification

Course Code: ECE 4104 **Course Title:** Integrated Circuits

23. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE 4104			
prerequisite	-----			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Prerequired Course	----			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

24. Course Aims

No.	Aim
1	Identifying, formulate, and solve complex Integration circuit engineering problems, by applying engineering fundamentals, basic science and mathematics (AM1)
2	Design model and analyse a solid-state component for a specific application. (AM1)

25. Course Learning Outcomes (LOs)

CLO1	Identify the main principles, characteristics, and methodologies of Integrated Circuit manufactured process by applying electronic engineering fundamental, electronic basic science, and mathematics.
CLO2	Formulate, modeling, and solve, the different types of integrated circuit families by applying electronic engineering fundamental, electronic basic science, and mathematics.
CLO3	Use appropriate mathematical and analytical methods for modelling and analyzing Design and Fabrication methods of Logic CMOS Integrated Circuit.

26. Course Contents

No.	Topics	Week
1	Why build Integrated Circuits(ICs), History of ICs. •Properties of VLSI, Moore's Law ,and Components of IC. •VLSIMOS Transistors, Scaling, and VLSI Design Considerations (Problems).	1
2	Mixed Signal VLSI, Digital Design of VLSI, and Trend sin VLSI. •Summary of Technology Trend. •MOSFET as a Capacitor.	2
3	**Digital MOSFET:** •NMOS Review, and PMOS Review. •MOS Switch. •Digital MOS Switch. •MOSFET as a switch.	3
4	**Digital MOSFET:** •Switch Networks. •Single Pass Transistor Switch. •CMOS Transmission Gate (TG)Switch.	4
5	**MOSFET Inverters:** •Introduction to Digital Inverter. •The Main Types of MOS Inverters. •Resistive Load Inverter. •EMD Inverter, DMD Inverter, and CMOS Inverter. •Pseudo CMOS Inverter, and Bi CMOS Inverter	5
6	**MOSFET Inverters:** Dynamic MOS Inverter. •Realization Problems Rules. •Dynamic Behavior of Inverters. •Evaluating tr&tffor CMOS Inverter.	6
7	Mid term exam.	7
8	**Noise Margin:** •Actual VTC. •Inverting Voltage & Inverting Ratio.	8

	•Noise Margins.	
9	**Noise Margin:** Noise Margin versus Noise Immunity. •CMOS VTC, and Beta Ratio. •Noise in Digital Ics, and Noise Margin sin DMD.	9
10	**Design Rules:** •Electrical Design Rules. •Mandatory Design Rules. •Geometrical Design Rules.	10
11	**Design Rules:** Layout. Stick Diagram.	11
12	**Semiconductor Memories:** •Memory Classification •Memory Architectures •The Memory Core	12
13	**Semiconductor Memories:** Periphery Reliability	13
14	Revision	14

27. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO1	√	√		√								
CLO2	√	√		√								
CLO3	√	√		√								√

28. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√
2	Online lectures and assignments	√

29. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Written exam	CLO1, CLO 2, CLO 3
2	Quizzes and reports	CLO1, CLO 2, CLO 3
3	Oral exams	
4	Practical	
5	Project applied on a practical field problem	CLO1, CLO 3
6	Presentation	
7	Assignments	
8	Researches	
9	Self-Learning	
10	Simulations	

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	7
5	Oral/ Practical Exam	
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	**Weights%**	**Weights**	**Weights%**	**Weights**
Teacher Opinion	Quizzes	%5	40	%5	5
	Assignments	%10		%10	10
	patriations	%5		%5	5
	Mid-term exam	%20		%50	20
Final Exam		%60	60		60
Total		%100	100		100

30. List of References

- Peter Shepherd, “Integrated Circuit Design, Fabrication, and Test”, 1996.
-N.Westand D.Harris, CMOS VLSI Design
.-S.Kangand Y.Leblebici, CMOS Digital Integrated Circuits.
-E.D.Fabricius, Introduction To VLSI Design.
-Wayne Wolf, FPGA-Based system Design.

31. Facilities required for teaching and learning

Lecture/Classroom
White board
Data show

32. Matrix of Course Content with Course LO’s

No.	**Topics**	**Aim**	**LO's**

1	Implementation of integrated circuits, advantage of IC, and its applications	1	CLO1
2	Classification of IC and its economics of implementation, design rules, reflective metal / oxide / semiconductor negative as the basic unit build digital circuits	1	CLO1
3	Brief, IC Chip fabrication processes (crystal growth, oxidation, lithography pattering, etching pattering, diffusion, Isolation, Metallization, and packing	1	CLO1
4	Crystal growth process and crystal structure planes.	1	CLO 1
5	Oxidation process types, why, layer thickness calculation.	1	CLO 1, CLO 2
6	lithography pattering process.	1	CLO 1, CLO.2
7	Etching pattering process.	1	CLO 1, CLO 2
8	Epitaxial growth types (hetero, homo),	1	CLO 1, CLO.2
9	Limitation, etching, and cleaning	1	CLO 1, CLO 2
10	Diffusion process	1	CLO 1, CLO.2
11	Ion implementation Process	1	CLO 1, CLO 2
12	Active and passive elements IC fabrication	1	CLO2,CLO3
13	Basic elements design using NMOS in comparison with CMOS	1	CLO3
14	The time of propagation delay, power consumption	1	CLO 1, CLO 2

33. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO 1	Identify the main principles, characteristics, and methodologies of Integrated Circuit manufactured process by applying electronic engineering fundamental, electronic basic science, and mathematics.
		CLO 2	Formulate, modeling, and solve, the different types of integrated circuit families by applying electronic engineering fundamental, electronic basic science, and mathematics.
PLO13	Design and implement elements, modules, sub-systems or systems using technological and professional tools	CLO 3	Use appropriate mathematical and analytical methods for modelling and analyzing Design and Fabrication methods of Logic CMOS Integrated Circuit.

Title	Name	Signature
Course coordinator	**Dr. allam ameen**	
Head of Department		
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 4161 **Course Title: specialized elective course (2)**

Electronic measurement instrumentation

34. Basic information

Program Title	Electronics and communications Engineering Depart.			
Department offering the program	Electronics and communications Engineering Depart.			
Department offering the course	Electronics and communications Engineering Depart.			
Course Code	ECE4161			
Prerequisites	--------			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

35. Course Aims

No.	Aim
1	Identify, analyze, and solve practical electronic circuit. (AM3)
2	Acquire the required skills to perform laboratory and field experiments and interpret their results. (AM4)

36. Course Learning Outcomes (LOs)

CLO.23	Design elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
CLO.24	Implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

37. Course Contents

Topics	Week
Memories	1

Sawtooth generators	2
Active filters	3
Analog multiplication circuits	4
Logarithmic Amplifiers	5
Stability of circuits	6
Midterm Exam	7
Probes and Signal processing circuits	8
Information transformation	9
Digital to analog converter/Analog to digital converter	10
Voltage to current converter/current to voltage converter	11
Automatic measurement systems	12
Phase Locked loop	13
Spectrum Analyzer	14

38. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.23	√	√			√	√						√
CLO.24	√	√			√	√						√

39. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason

1	Additional tutorials	√

40. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Written exam	CLO.23, CLO.24
2	Quizzes and reports	CLO.23, CLO.24
3	Oral exams	
4	Practical	
5	Project applied on a practical field problem	
6	Presentation	
7	Assignments	CLO.23, CLO.24
8	Researches	CLO.23, CLO.24
9	Self-Learning	
10	Simulations	

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Presentation	----
4	Mid-term Exam	7
5	Oral/ Practical Exam	----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	20%	20
	Attendance			0%	0
	Mid-term exam			20%	20
Final Exam		60%	60		60
Total			100		100

41. List of References

[1] D. A. Neamen, Microelectronics: Circuit Analysis and Design, F. Edition, Ed., New York: Raghothaman Srinivasan, 2010.
[2] T. L. Floyd, ELECTRONIC DEVICES, Electron Flow Version, Ninth Edition ed., New Jersey: Prentice Hall,, 2012.
[3] B. Razavi, Fundamentals of microelectronics, Review Edition ed., 2007.
[4] K. C. S. Adel S. Sedra, Microelectronic Circuits, s. edition, Ed., New York:Oxford University Press, 2015.

42. Facilities required for teaching and learning

Lecture

White board

43. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Memories	1	CLO.23
2	Sawtooth generators	1	CLO.23
3	Active filters	1	CLO.23, CLO.24
4	Analog multiplication circuits	1	CLO.23
5	Logarithmic Amplifiers	1	CLO.23
6	Stability of circuits	1	CLO.23, CLO.24
7	Midterm Exam		
8	Probes and Signal processing circuits	2	CLO.23, CLO.24
9	Information transformation	1	CLO.23
10	Digital to analog converter/Analog to digital converter	1,2	CLO.23
11	Voltage to current converter/current to voltage converter	1,2	CLO.23
12	Automatic measurement systems	2	CLO.23
13	Phase Locked loop	1,2	CLO.23
14	Spectrum Analyzer	1,2	CLO.23, CLO.24

44. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO13	Design and implement elements, modules, sub-systems or systems using technological and professional tools.	CLO.23	Design elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
		CLO.24	Implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

Title	Name	Signature
Course coordinator		
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 4162 **Course Title: Satellite communication system**

1. Basic information

Program Title	Electronics and communications Engineering Depart.			
Department offering the program	Electronics and communications Engineering Depart.			
Department offering the course	Electronics and communications Engineering Depart.			
Course Code	**ECE 4162**			
Prerequisite	----------			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Combine scientific research skills with continuous development through self-learning and acquiring additional skills and knowledge (AM2)
2	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)

3. Course Learning Outcomes (LOs)

CLO.25	Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.
CLO.30	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems

4. Course content

Topics	Week
Overview of satellite systems	1
Orbits and lunching method	2
Orbits and lunching method	3
Radio wave communication	4
Bandwidth utilization and antennas	5
Space segment	6
Space segment	7
Revision and Research discussion	8
Mid Term Exam	9
Earth segment	10
Space link	11
Space link	12
Interference	13
Revision and Research discussion	14
Final exam	15

4. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.25	√	√		√								
CLO.30	√			√	√	√					√	√

5. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

6. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Sheets	CLO.25
2	Quizzes	CLO25
3	Mid-term Exam	CLO.25
4	Presentation	CLO.30
5	Final Exam	CLO.25,CLO.30

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Sheets	Bi-weekly
2	Quizzes	3 &5&7& 11
3	Mid-term Exam	9
4	Presentation	14
5	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	**Weights%**	**Weights**	**Weights%**	**Weights**
Teacher Opinion	Quizzes &sheets	35%	35	5%	5
	Mid-term exam			30%	30
Presentation	Presentation	5%	5	5%	5
Final Exam				60%	60
Total				100%	100

7. List of References

[1] Satellite Communications, 4th Edition, Dennis Roddy

8. Facilities required for teaching and learning

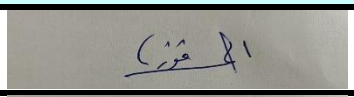
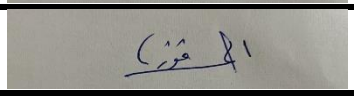
Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

9. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Overview of satellite systems	2	CLO.25
2	Orbits and lunching method	2	CLO.25
3	Orbits and lunching method	2	CLO.25
4	Radio wave communication	2	CLO.25
5	Bandwidth utilization and antennas	2	CLO.25
6	Space segment	1	CLO.25
7	Space segment	1	CLO.25
8	Revision and Research discussion	2	CLO.25,CLO.30
9	Mid Term Exam		
10	Earth segment	1	CLO.25
11	Space link	2	CLO.25
12	Space link	2	CLO.25
13	Interference	2	CLO.25,CLO.30
14	Revision and Research discussion	2	CLO.25,CLO.30
15	Final exam	2	CLO.25,CLO.30

10. Matrix of Program LOs with Course Los

Program Los		Course Los
PLO14	Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation because of its suitability for a specific application.	CLO.25 Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation because of its suitability for a specific application.
PLO17	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems	CLO.30 Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems

Title	Name	Signature
Course coordinator	**Assoc. Prof. Dr. Ahmed Fawzy**	
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 4163 **Course Title: Integrated Circuit Technology**

45. Basic information

Program Title	Electronics and communications Engineering Depart.			
Department offering the program	Electronics and communications Engineering Depart.			
Department offering the course	Electronics and communications Engineering Depart.			
Course Code	ECE 4163			
Prerequisite	--			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Minor**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

46. Course Aims

No.	Aim
1	Apply Communication and electronic engineering based on physical sciences and mathematics. (AM1)
2	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)

47. Course Learning Outcomes (LOs)

CLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess.
CLO3	Evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.

48. Course Contents

Topics	Week
Radio frequency amplifiers.	1
Medium frequency amplifiers	2
Video amplifiers	3
Harmonious and disharmonious oscillators	4
Balance of oscillators	5
Voltage controlled oscillators	6
Midterm Exam.	7
Closed phase loop	8
Capacitance rates	9
Frequency and Phase rates.	10
Pulse rates. Explorers	11
Transmitting and Receiving Circuits	12
Circuit Simulator	13
Numerical, analog and mixed systems	14
	15
Final Exam.	16

49. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO1	√	√			√							
CLO2	√	√		√	√				√			
CLO3	√	√			√							

50. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√
2	Online lectures and assignments	

51. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports / Sheets	CLO1, CLO2
3	Quiz 1 / Quiz 2	CLO3
4	Mid-term Exam	CLO1, CLO2
5	Oral/ Practical Exam	CLO3
6	Final Exam	CLO1, CLO2, CLO3

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	9
5	Oral/ Practical Exam	15
6	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	**Weights%**	**Weights**	**Weights%**	**Weights**
Teacher Opinion	Reports / sheets / Activities	يتم وضع نسبة مئوية للدرجة من اجمالي درجة المقرر	درجة اعمال السنة	5%	5
	Attendance			5%	5
	Quiz 1 / Quiz 2			5%	5
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects			5%	5
	Final oral / practical exam				
Final Exam				60%	60
Total				100%	100

52. List of References

[1] S.K. Kataria and Sons, “Integrated Circuit Technology”, 2016

53. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

54. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Radio frequency amplifiers.	1	CLO1
2	Medium frequency amplifiers	1	CLO1, CLO2
3	Video amplifiers	1	CLO1, CLO2
4	Harmonious and disharmonious oscillators	1	CLO1, CLO2
5	Balance of oscillators	1	CLO1, CLO2
6	Voltage controlled oscillators	1	CLO1, CLO2
7	Closed phase loop	1	CLO1, CLO2
8	Capacitance rates	1	CLO1, CLO2
9	Frequency and Phase rates.	1	CLO1, CLO2
10	Pulse rates.	1	CLO1, CLO2
11	Explorers	1	CLO1, CLO2
12	Transmitting and Receiving Circuits	2	CLO3
13	Circuit Simulator	2	CLO3
14	Numerical, analog and mixed systems	2	CLO3

55. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Explain the concepts of amplifiers and oscillators.
PL2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	CLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess.
		CLO3	Evaluate findings and use statistical analyses and objective engineering judgment to draw conclusions.

Title	Name	Signature
Course coordinator		
Program coordinator		
Head of Department		
Date of Approval	**02/09/2023**	

Course Specification

Course Code: ECE 4171 **Course Title: Optical Communication systems**

56. Basic information

Program Title	Electronic and Communication Engineering.			
Department offering the program	Electronic and Communication Engineering.			
Department offering the course	Electronic and Communication Engineering.			
Course Code	ECE 4171			
Prerequisite	----			
Year/level	Fourth year / Second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	3

57. Course Aims

No.	Aim
1	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)
2	Identify the project management methods, and efficiently utilize available resources and learn design management techniques. (AM6)
3	Improve the student skills in handling and dealing with electronics and communication technology including the fabrication, characterization, and installation of components, devices, and systems. (AM10)

58. Course Learning Outcomes (LOs)

CLO.1	Explain the concepts of Optical Fiber cable with applying the design process. By Select, model and analyze optical systems applicable to the specific discipline.
CLO.2	Applying the concepts of: generation, transmission and distribution of Optical fiber systems. Discovering and identifying the communication system of the fiber cable system.
CLO.3	Designing an optical fiber system with avoiding dispersion. And study the different types of dispersion. Design model and analyze an electrical/electronic/digital system or component for a specific application.

CLO.4	Identify the tools required to optimize this design and analyze the optical link budget for an optical communication system.

59. Course Contents

No.	Topics	Week
1	Introduction of Optical Fiber Systems.	1
2	Fundamentals of Optical Fiber Systems.	2
3	Dispersion in Optical Fiber.	3
4	Modal Dispersion.	4
5	Chromatic and Waveguide Dispersion.	5
6	Polarization Mode Dispersion.	6
7	Midterm.	7
8	Total Dispersion and Dispersion Comparisons.	8
9	Fiber Characteristics	9
10	Fiber Optic Light Sources.	10
11	Photo Detectors & Receivers.	11
12	Optical Budget.	12
13	Revision	13
14	Practical exam	14

60. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO1	√											
CLO2			√	√								
CLO3		√					√			√	√	√
CLO4						√		√				

61. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√

62. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-------
2	Reports / Sheets	CLO1, CLO2
3	Quiz 1 / Quiz 2	CLO1, CLO2
4	Mid-term Exam	CLO1, CLO2
5	Oral/ Practical Exam	CLO1, CLO2
6	Final Exam	PLO11, PLO12

7.2 Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	7
5	Oral/ Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	**Weights%**	**Weights**	**Weights%**	**Weights**
Teacher Opinion	Reports / sheets / Activities	%35	35	10%	10
	Attendance			0%	0
	Quiz 1 / Quiz 2			5%	5
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance	5%	5		
	Lab. Reports				
	Lab. Activities / Projects			5%	5
	Final oral / practical exam				
Final Exam				60%	60
Total				100%	100

63. List of References

[1] Kumar, "Principles Of Optical Communications & Opto Electronics" SECOND EDITION, Laxmi Publications, 2007.
[2] Kaminow, "The Optical Communications Reference", FIRST EDITION, 2009.
[3] Kang Liu, "Principles And Applications Of Optical Communications", Irwin, 1996.
[4] Binh, "Optical Fiber Communications Systems", SECOND EDITION, 2014.
[5] Gerd Keiser, "Optical Fiber Communications" THIRD EDITION, Mc Graw Hill Higher Education, 2000.
[6] John M. Senior, "Optical Fiber Communications Principles and Practice", THIRD EDITION, Pearson Education, 2009.

64. Facilities required for teaching and learning

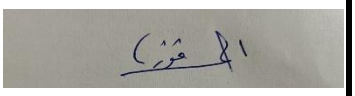
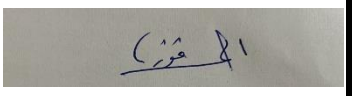
Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

65. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Introduction of Optical Fiber Systems.	1	CLO1
2	Fundamentals of Optical Fiber Systems.	2	CLO1, CLO2
3	Dispersion in Optical Fiber.	2	CLO1, CLO2
4	Modal Dispersion.	2	CLO1, CLO2
5	Chromatic and Waveguide Dispersion.	2	CLO1, CLO2
6	Polarization Mode Dispersion.	2	CLO1, CLO2
8	Total Dispersion and Dispersion Comparisons.	2	CLO1, CLO2
9	Fiber Characteristics	1	CLO1
10	Fiber Optic Light Sources.	3	CLO3
11	Photo Detectors & Receivers.	3	CLO3, CLO4
12	Optical Budget.	3	CLO3, CLO4
13	Revision	3	CLO3, CLO4

66. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PLO11	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.	CLO1	Explain the concepts of Optical Fiber cable with applying the design process. By Select, model and analyze optical systems applicable to the specific discipline.
		CLO2	Applying the concepts of: generation, transmission and distribution of Optical fiber systems. Discovering and identifying the communication system of the fiber cable system.
PLO12	Design model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO3	Designing an optical fiber system with avoiding dispersion. And study the different types of dispersion. Design model and analyze an electrical/electronic/digital system or component for a specific application.
		CLO4	Identify the tools required to optimize this design and analyze the optical link budget for an optical communication system.

Title	Name	Signature
Course coordinator	**Assoc. Prof. Dr. Ahmed Fawzy**	
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/9/2024**	

Course Specification

Course Code: ECE4172 **Course Title: specialized elective course (3)**

67. Basic information

Program Title	Electronics and communications Engineering Depart.			
Department offering the program	Electronics and communications Engineering Depart.			
Department offering the course	Electronics and communications Engineering Depart.			
Course Code	ECE4172			
Prerequisite	--			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

68. Course Aims

No.	Aim
1	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)

69. Course Learning Outcomes (LOs)

CLO.21	Model an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
CLO.22	Analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

70. Course Contents

Topics	Week
Introduction	1
Application specific integrated circuits: Library Design	2
Application specific programmable integrated circuits	3
Application specific programmable integrated circuits: Logic Cells (1)	4
Application specific programmable integrated circuits: Logic Cells (2)	5
Application specific programmable integrated circuits: Input/Output Circuits	6
Midterm Exam	7
Application specific programmable integrated circuits: interconnects	8
Application specific programmable integrated circuits: Simulators (FPGA) (1)	9
Application specific programmable integrated circuits: Simulators (FPGA) (2)	10
Application specific integrated circuits: Programming Languages (VHDL)(1)	11
Application specific integrated circuits: Programming Languages (VHDL)(2)	12
Application specific integrated circuits: Programming Languages (C)	13
Practical Exams	14

71. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.21	√	√			√							
CLO.22	√	√			√							

72. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√

73. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Written exam	CLO.21, CLO.22
2	Quizzes and reports	CLO.21, CLO.22
3	Oral exams	
4	Practical	
5	Project applied on a practical field problem	
6	Presentation	
7	Assignments	CLO.21, CLO.22
8	Researches	
9	Self-Learning	
10	Simulations	

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Presentation	----
4	Mid-term Exam	7
5	Oral/ Practical Exam	----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	20%	20
	Attendance			0%	0
	Mid-term exam			20%	20
Final Exam		60%	60		60
Total			100		100

74. List of References

75. Facilities required for teaching and learning

Lecture

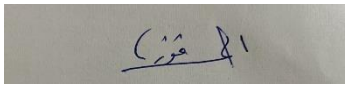
White board

76. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Introduction	1	CLO.21, CLO.22
2	Application specific integrated circuits: Library Design	1	CLO.21, CLO.22
3	Application specific programmable integrated circuits	1	CLO.21, CLO.22
4	Application specific programmable integrated circuits: Logic Cells (1)	1	CLO.21, CLO.22
5	Application specific programmable integrated circuits: Logic Cells (2)	1	CLO.21, CLO.22
6	Application specific programmable integrated circuits: Input/Output Circuits	1	CLO.21, CLO.22
7	Midterm Exam		
8	Application specific programmable integrated circuits: interconnects	1	CLO.21, CLO.22
9	Application specific programmable integrated circuits: Simulators (FPGA) (1)	1	CLO.21, CLO.22
10	Application specific programmable integrated circuits: Simulators (FPGA) (2)	1	CLO.21, CLO.22
11	Application specific integrated circuits: Programming Languages (VHDL)(1)	1	CLO.21, CLO.22
12	Application specific integrated circuits: Programming Languages (VHDL)(2)	1	CLO.21, CLO.22
13	Application specific integrated circuits: Programming Languages (C)	1	CLO.21, CLO.22

77. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PL12	Design model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO.21	Model an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
		CLO.22	Analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

Title	Name	Signature
Course coordinator		
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE4173 **Course Title: specialized elective course (3) Integrated circuits applications**

78. Basic information

Program Title	Electronics and communications Engineering Depart.			
Department offering the program	Electronics and communications Engineering Depart.			
Department offering the course	Electronics and communications Engineering Depart.			
Course Code	ECE4173			
Prerequisite	--			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

79. Course Aims

No.	Aim
1	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)

80. Course Learning Outcomes (LOs)

CLO.6	Apply engineering design processes to meet specified needs.
CLO.23	Design and implement modules, sub-systems or systems using technological and professional tools.

81. Course Contents

Topics	Week
Radio amplifiers	1
MidBand frequency amplifiers	2
Video Amplifiers	3

Harmonic Oscillators	4
Non-Harmonic Oscillators	5
Oscillators stability	6
Midterm Exam	7
Voltage controlled oscillators	8
Phase locked loop	9
Mixers	10
Transmitter and receiver circuits	11
Numerical and Analog systems	12
Mixed-mode systems	13
Practical Exams	14

82. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.6	√	√		√	√							
CLO.23	√	√		√	√							

83. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√
2		

84. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Written exam	CLO.6, CLO.23
2	Quizzes and reports	CLO.6, CLO.23
3	Oral exams	
4	Practical	
5	Project applied on a practical field problem	CLO.6, CLO.23
6	Presentation	
7	Assignments	CLO.6, CLO.23
8	Researches	
9	Self-Learning	
10	Simulations	

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Presentation	----
4	Mid-term Exam	7
5	Oral/ Practical Exam	----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	15%	15
	Attendance			5%	5
	Mid-term exam			20%	20
Final Exam		60%	60		60
Total			100		100

85. List of References

86. Facilities required for teaching and learning

Lecture
White board

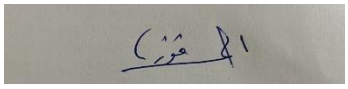
87. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Radio amplifiers	1	CLO.6, CLO.23
2	MidBand frequency amplifiers	1	CLO.6, CLO.23
3	Video Amplifiers	1	CLO.6, CLO.23
4	Harmonic Oscillators	1	CLO.6, CLO.23
5	Non-Harmonic Oscillators	1	CLO.6, CLO.23
6	Oscillators stability	1	CLO.6, CLO.23
7	Midterm Exam	1	CLO.6, CLO.23
8	Voltage controlled oscillators	1	CLO.6, CLO.23
9	Phase locked loop		CLO.6, CLO.23
10	Mixers	1	CLO.6, CLO.23
11	Transmitter and receiver circuits	1	CLO.6, CLO.23
12	Numerical systems and Analog systems	1	CLO.6, CLO.23
13	Mixed-mode systems	1	CLO.6, CLO.23

88. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PL3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	CLO.6	Apply engineering design processes to meet specified needs.
PL13	Design and implement elements, modules, sub-systems or systems using technological and professional tools.	CLO.23	Design and implement modules, sub-systems or systems using technological and professional tools.

Title	Name	Signature

Course coordinator		
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 4201 **Course Title:** Electronic Measurements & Testing 4

1. Basic information

Program Title	Electronics and Communication Engineering.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE 4201			
Prerequisite	-----			
Year/level	Fourth year / Second Semester (2nd Semester)			
Specialization	**Major**			
Prerequired Course	**----**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	0	0	4	4

2. Course Aims

No.	Aim
1	Design and conduct experiments as well as analyze and interpret data. Work effectively within multi-disciplinary teams in the experiments of: complex open microwave systems, microwave power consumption, attenuation, SWR, and Direction coupler. (AM4)

3. Course Learning Outcomes (LOs)

CLO.31	Use the appropriate tools and equipment to measure system performance
CLO.32	analyze the system performance's results correctly

4. Course Contents

Topics	Week
Explain Microwave open system Experiment	1
Microwave open system Experiment	2
Explain Power consumption with different loads	3
Power consumption with different loads	4
Explain Power, and interactions of microwave attenuators, And, Power, and interactions of microwave attenuators	5
Explain Gun Oscillator adjustment and its parameters experiments	6
Midterm	7
Gun Oscillator adjustment and its parameters experiments	8
Explain Microwave gain measurement experiments, and Microwave gain measurement experiments	9
Explain SWR setup and measurement experiments	10
SWR setup and measurement experiments	11
Explain Direction Coupler performance experiments	12
Direction Coupler performance experiments	13
Practical Test	14
Final Exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO1			√									√
CLO2			√									√

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Written exam	CLO.32
2	Oral exams	CLO.31, CLO.32
3	Practical	CLO.31, CLO.32

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Mid-term Exam	7
4	Oral/ Practical Exam	14
5	Final Exam	15

	Assessment Method	Weights%	Weights
Teacher Opinion	Practical Attendance	10%	10
	Attendance	10%	10
	Quiz 1 / Quiz 2	10%	10
	Final oral / practical exam	30%	30
Final Exam		40%	40
Total		100%	100

8. List of References

[1] Laboratory manual.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Data show

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Explain Microwave open system Experiment	1	CLO.31
2	Microwave open system Experiment	1	CLO.31
3	Explain Power consumption with different loads	1	CLO.31
4	Power consumption with different loads	1	CLO.31
5	Explain Power, and interactions of microwave attenuators, And, Power, and interactions of microwave attenuators	1	CLO.31, CLO.32
6	Explain Gun Oscillator adjustment and its parameters experiments	1	CLO.31, CLO.32
7	**Midterm**	1	CLO.31
8	Gun Oscillator adjustment and its parameters experiments	1	CLO.31
9	Explain Microwave gain measurement experiments, and Microwave gain measurement experiments	1	CLO.31
10	Explain SWR setup and measurement experiments	1	CLO.31
11	SWR setup and measurement experiments	1	CLO.31
12	Explain Direction Coupler performance experiments	1	CLO.31
13	Direction Coupler performance experiments	1	CLO.31
14	Practical Test	1	CLO.31
15	Final Exam		

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PL18	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions for complex open microwave systems, microwave power consumption, attenuation, SWR, and Direction coupler.	CLO.31	Use the appropriate tools and equipment to measure system performance
PL18	Use the appropriate tools and equipment to measure complex open microwave systems, microwave power consumption, attenuation, SWR, and Direction coupler and analyze the results correctly.	CLO.32	analyze the system performance's results correctly

Title	Name	Signature
Course coordinator	**Dr. Osama Elmowafy**	
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/9/2024**	

Course Specification

Course Code: ECE 4202 **Course Title: Communication Networks**

1. Basic information

Program Title	Electronic and Communication Engineering Dept.			
Department offering the program	Electronic and Communication Engineering Dept.			
Department offering the course	Electronic and Communication Engineering Dept.			
Course Code	ECE 4202			
Prerequisite	ECE 3201			
Year/level	Fourth year / Second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)
2	Identify the project management methods, and efficiently utilize available resources and learn design management techniques. (AM6)
3	Improve the student skills in handling and dealing with electronics and communication technology including the fabrication, characterization, and installation of components, devices, and systems. (AM10)

3. Course Learning Outcomes (LOs)

CLO1	Utilize contemporary technologies, codes of practice and standards,
CLO2	quality guidelines, health and safety requirements, environmental issues, and risk management principles.
CLO3	Adopt suitable national and international standards and codes to: design, build, operate, inspect.
CLO4	maintain electrical/electronic equipment, systems and services.

4. Course Contents

No.	Topics	Week

1	Introduction to Networks.	1
2	Network Basics Classification of Networks.	2
3	OSI Reference Model.	3
4	Encapsulation and De-encapsulation.	4
5	IP Addressing.	5
6	Subnetting.	6
7	Midterm.	7
8	Routers and Routing.	8
9	Routing Introduction.	9
10	Distance Vector Protocol Problems and Solutions.	10
11	Initial Router Configuration.	11
12	Project discussion on packet tracer.	12
13	Discussing, presenting and test the project.	13
14	Practical Exam.	14

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods

	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO1	√											
CLO2			√	√								
CLO3		√					√			√	√	√
CLO4						√		√				

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports / Sheets	CLO1, CLO2
3	Quiz 1 / Quiz 2	CLO1, CLO2
4	Mid-term Exam	CLO1, CLO2
5	Oral/ Practical Exam	CLO3, CLO4
6	Final Exam	PLO4, PLO15

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	7
5	Oral/ Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	5%3	53	5%	5
	Attendance			5%	5
	Quiz 1 / Quiz 2			5%	5
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance	5%	5		
	Lab. Reports				
	Lab. Activities / Projects			5%	5
	Final oral / practical exam				
Final Exam				60%	60
Total				100%	100

8. List of References

[1] Dhubkarya, "Network And System", 2007.
[2] Gupta, "Network Analysis And Synthesis", 2010.
[3] Behrouz A. Forouzan, "DATA COMMUNICATIONS AND NETWORKING," FOURTH EDITION, Copyright © 2007 byThe McGraw-Hill Companies.
[4] Behrouz A. Forouzan, "TCP/IP PROTOCOL SUITE," FOURTH EDITION, Copyright © 2010 byThe McGraw-Hill Companies.
[5] Simon Haykin, "Communication systems," fourth edition, Copyright © 2000 by John Wiley.
[6] A. Bruce Carlson, "Communication systems (An Introduction to Signals and Noise in Electrical Communication)," FOURTH EDITION, Copyright © 2010 by The McGraw-Hill Companies.
[5] Cisco Certified Network Associate course (ICND 1 and ICND 2), 2014

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Introduction to Networks.	1	CLO1

2	Network Basics Classification of Networks.	1	CLO1
3	OSI Reference Model.	1	CLO1
4	Encapsulation and De-encapsulation.	2	CLO1, CLO2
5	IP Addressing.	2	CLO1, CLO2
6	Subnetting.	1	CLO1
8	Routers and Routing.	2	CLO1, CLO2
9	Routing Introduction.	2	CLO1, CLO2
10	Distance Vector Protocol Problems and Solutions.	1	CLO1, CLO2
11	Initial Router Configuration.	2	CLO1, CLO2
12	Project discussion on packet tracer.	1, 2	CLO3, CLO4
13	Discussing, presenting and test the project.	3	CLO3, CLO4

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO1	Utilize contemporary technologies, codes of practice and standards,
		CLO2	quality guidelines, health and safety requirements, environmental issues, and risk management principles.
PLO15	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic equipment, systems and services.	CLO3	Adopt suitable national and international standards and codes to: design, build, operate, inspect.
		CLO4	maintain electrical/electronic equipment, systems and services.

Title	Name	Signature

Course coordinator	**Assoc. Prof. Dr. Ahmed Fawzy**	
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 4203 **Course Title: Antennas**

12. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE 4203			
Prerequisite	ECE 3105			
Year/level	Fourth year / Second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

13. Course Aims

No.	Aim
1	Dealing and characterization of electronic circuits. (AM5)

14. Course Learning Outcomes (LOs)

CLO.23	Explain the concepts of antenna with applying the design process of the antenna parameters.
CLO.24	Discovering and identifying the antenna parameters of antenna sustainable design and development.
CLO.31	Designing an antenna using a simulator to reach the certain needs to measure system performance.
CLO.32	Fabricating the antenna and measure it and analyze the results correctly.

15. Course Contents

Topics	Week
Introduction to Antennas.	1

Properties of Antenna, Types of Antennas, and Radiation Mechanism.	2
Fundamental Parameters of Antennas.	3
Antenna efficiency, Input impedance, and Polarization.	4
Radiation Integrals And Potential Functions.	5
Electric & Magnetic Fields For Electric (J) & Magnetic (M) Current Sources.	6
Midterm Exam.	7
Linear wire antennas.	8
Half Wave Dipole.	9
Loop Antennas, Circular Loop Antennas, and Square Loop Antennas.	10
Antenna Arrays, Two-element Array, and N-element Linear Array.	11
Broadside Array, and Ordinary End-Fire Array.	12
Microstrip Patch Antennas.	13
Practical Exam	14
Final Exams	15

16. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods

	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.23	√											
CLO.24			√	√								
CLO.31		√					√			√	√	√
CLO.32						√		√	√			

17. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional tutorials	√

18. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Written exam	CLO23, CLO24, CLO31, CLO32
2	Assignments	CLO23, CLO24, CLO31, CLO32
3	Simulations	CLO31, CLO32

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz	4 & 10
4	Mid-term Exam	7
5	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	5%	5
	Attendance			5%	5
	Quiz			10%	10
	Mid-term exam			20%	20
Final Exam				60%	60
Total				100%	100

19. List of References

[1] Fang, "Antenna Theory and Microstrip Antennas", First Editon, 2006
[2] Kraus, "Antennas And Wave Propagation", Fourth edition, 2010.
[3] Constantine A. Balanis "ANTENNA THEORY ANALYSIS AND DESIGN", 2005.

20. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

21. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's

1	Introduction to Antennas.	1	CLO23,
2	Properties of Antenna, Types of Antennas, and Radiation Mechanism.	1	CLO23
3	Fundamental Parameters of Antennas.	1	CLO23, CLO24
4	Antenna efficiency, Input impedance, and Polarization.	1	CLO23, CLO24
5	Radiation Integrals And Potential Functions.	1	CLO23, CLO24
6	Electric & Magnetic Fields For Electric (J) & Magnetic (M) Current Sources.	1	CLO23, CLO24
8	Linear wire antennas.	1	CLO23, CLO24
9	Half Wave Dipole.	1	CLO23, CLO24
10	Loop Antennas, Circular Loop Antennas, and Square Loop Antennas.	1	CLO23, CLO24, CLO31, CLO32
11	Antenna Arrays, Two-element Array, and N-element Linear Array.	1	CLO31, CLO32
12	Broadside Array, and Ordinary End-Fire Array.	1	CLO23, CLO24, CLO31, CLO32
13	Microstrip Patch Antennas.	1	CLO31, CLO32

22. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL13	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	CLO23	Explain the concepts of antenna with applying the design process of the antenna parameters.
		CLO24	Discovering and identifying the antenna parameters of antenna sustainable design and development.
PL18	Use the appropriate tools and equipment to measure system	CLO31	Designing an antenna using a simulator to reach the certain needs to measure system

	performance and analyze the results correctly.		performance.
		CLO32	Fabricating the antenna and measure it and analyze the results correctly.

Title	Name	Signature
Course coordinator		
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE4261 **Course Title:** Specialized Elective Course (4) Mobile Communication

23. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE4261			
Prerequisite	----------			
Year/level	Fourth year / Second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

24. Course Aims

No.	Aim
1	Identify, analyse, and solve practical problems, making use of appropriate engineering tools, programs and techniques (AM.3)

25. Course Learning Outcomes (LOs)

CLO.25	Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.
CLO.30	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems

26. Course contents

Topics	Week
Introduction and Over view of Wireless Communication System	1
Multiple Access Techniques and Wireless Challenges	2
GSM architecture & Subscribers' Identities	3
GSM architecture & Subscribers' Identities	4
Air interface channels	5
Radio Transmission Problems	6
Mid Term Exam	7
Call Management (Originating and Terminating)	8
Handover Mobility Management	9
Handover types	10
Location Update	11
Short Message Service	12
GSM Coverage Plan	13
Revision	14
Final exam	15

27. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO25	√	√			√							
CLO30									√		√	√

28. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	

29. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1.	Reports / Sheets	CLO25, CLO.30
2.	Quizzes	CLO25
3.	Mid-term Exam	CLO25
4.	Final Exam	CLO25

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1.	Reports / Sheets	11.13
2.	Quiz	10
3.	Mid-term Exam	7
4.	Final Exam	

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets	40%	40	5%	5

	Quiz 1 / Quiz 2			5%	5
	Mid-term exam			30%	30
Final Exam				60%	60
Total				100%	100

30. List of References

- B.P. Lathi, Modern Digital and Analog communication systems, 2018.
- LEON W. COUCH II , Digital And Analog Communication systems, 2017

31. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

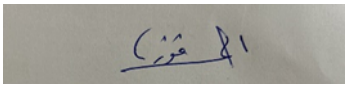
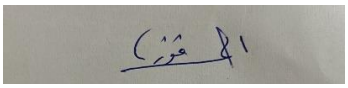
32. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Introduction and Over view of Wireless Communication System	1	CLO.25
2	Multiple Access Techniques and Wireless Challenges	1	CLO.25
3	GSM architecture & Subscribers' Identities	1	CLO.25
4	GSM architecture & Subscribers' Identities	1	CLO.25
5	Air interface channels	1	CLO.25
6	Radio Transmission Problems	1	CLO.25
7	Mid Term Exam	1	CLO.25
8	Call Management (Originating and Terminating)	1	CLO.25
9	Handover Mobility Management	1	CLO.25
10	Handover types	1	CLO.25
11	Location Update	1	CLO.25
12	Short Message Service	1	CLO.25, CLO30
13	GSM Coverage Plan	1	CLO.25,CLO.30
14	Revision	1	CLO.25
15	Final exam	1	CLO.25, CLO30

33. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO14	Estimate the performance of an electrical/electronic/digital	CLO.25	Estimate the performance of an electrical/electronic/digital system and

	system and circuit under specific input excitation because of its suitability for a specific application.		circuit under specific input excitation because of its suitability for a specific application.
PLO17	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems	CLO.30	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems

Title	Name	Signature
Course coordinator	**Assoc. Prof. Dr. Ahmed Fawzy**	
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 5252 **Course Title: Selected Topics on Communication Systems**

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE 5252			
Year/level	Fourth year / second Semester (2nd Semester)			
Specialization	**Major**			
Prerequired Course	ECE 5252			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Use appropriate mathematical methods or IT tools for modelling and analysing electronic and Advanced communication systems. (AM1)

3. Course Learning Outcomes (LOs)

CLO.23	Design elements, modules, sub-systems, or systems in communication engineering using technological and professional tools.
CLO.30	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems

4. Course Contents

Topics	Week
Radar Systems Overview.	1
Radar system physics.	2
Radar System principles of working.	3
Optical Fiber communications system.	4
Light propagation, and Fiber classifications.	5
Fiber optics Losses, and Noise.	6
Mid Term Exams	7
Light sources and detectors; Link budget	8
Call procedures; Cordless	10
Telephones; Paging systems	11
Public telephone network	12
Microwave Radio Communications	13
Practical Exams	14
Final Exams	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.23	√	√		√								
CLO.30	√	√		√			√					

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Written exam	CLO.23, CLO.30
2	Quizzes and reports	CLO.23, CLO.30
3	Assignments	CLO.23, CLO.30
4	Self-Learning	CLO.23, CLO.30

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	9
5	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	%10	40	%25	10
	Attendance	%10		%25	10
	Quiz 1 / Quiz 2	%10		%25	10
	Mid-term exam	%10		%20	20
Final Exam		%60	60		60
Total		%100	100		100

8. List of References

[1] Dr. A.K. Sen and Dr. A.B. Bhattacharya, "Radar Systems & Radio Aids to Navigation"
[2] Couch, “Digital and Analog Communication Systems”, Seventh Edition ©2007.
[3] Kennedy & Davis, “Electronic Communication System”, 4th Edition 1992.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Data show

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Radar Systems Overview.	1	CLO.23, CLO.30
2	Radar system physics.	1	CLO.23, CLO.30
3	Radar System principles of working.	1	CLO.23, CLO.30
4	Optical Fiber communications system.	1	CLO.23, CLO.30
5	Light propagation, and Fiber classifications.	1	CLO.23, CLO.30
6	Fiber optics Losses, and Noise.	1	CLO.23, CLO.30
7	Mid term Exam		
8	Light sources and detectors; Link budget	1	CLO.23, CLO.30
9	Telephone Systems: Subscriber loop;	1	CLO.23, CLO.30
10	Call procedures; Cordless	1	CLO.23, CLO.30
11	Telephones; Paging systems	1	CLO.23, CLO.30
12	Public telephone network	1	CLO.23, CLO.30
13	Microwave Radio Communications	1	CLO.23, CLO.30

11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PL13	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, andmathematics.	**CLO.23**	Design elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
PL17	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems	**CLO.30**	Practice computer programs for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems

Title	Name	Signature
Course coordinator		
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 42623 Course Title: Analog Integrated Circuit Design

1. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE 4263			
Prerequisite	-----			
Year/level	Fourth year / Second Semester (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

2. Course Aims

No.	Aim
1	Identify, formulate, and solve Analog Integrated Circuit Design problems by applying electric engineering fundamentals, basic science, and mathematics. (AM1)
2	Use appropriate mathematical methods or IT tools for modelling and analyzing electronic Analog Integrated Circuit Design. (AM1)

3. Course Learning Outcomes (LOs)

CLO.4	Develop appropriate experimentation and/or simulation, to analyze, interpret data, assess, and evaluate findings, and using statistical analyses and objective engineering judgment to draw conclusions.
CLO.23	Design elements, modules, sub-systems, or systems in electrical/electronic/digital engineering

4. Course Contents

Topics	Week
Introduction to analog VLSI, Device Modelling.	1
Basic analog blocks (current mirrors, and common-source).	2
Basic analog blocks (common-drain, and common-gate).	3
Basic analog blocks (cascode-different pair).	4
Frequency Response	5
Stability and frequency	6
Mid term exam	7
Introduction to operational amplifier.	8
operational amplifier (basics, and two-stage, miller)	10
operational amplifier (symmetrical, telescope, folded, and cascode)	11
Voltage and current references	12
Power references and assumptions	13
Practical Exams	14
Final Exams	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.4	√	√		√								
CLO.23	√	√		√			√					

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Written exam	**CLO.4, CLO.23**
2	Quizzes and reports	**CLO.4, CLO.23**
3	Assignments	**CLO.4, CLO.23**
4	Self-Learning	**CLO.4, CLO.23**

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	9
5	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	%10	40	%25	10
	Attendance	%10		%25	10
	Quiz 1 / Quiz 2	%10		%25	10
	Mid-term exam	%10		%25	10
Final Exam		%60	60		60
Total		%100	100		100

8. List of References

[1] Sharma Sanjay, "Analog & Digital Communication Engineering", 2010.
[2] Couch, "Digital and Analog Communication Systems", Seventh Edition ©2007.
[3] Kennedy & Davis, "Electronic Communication System", 4th Edition 1992.

9. Facilities required for teaching and learning

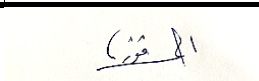
Lecture/Classroom
White board
Data show

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Introduction to analog VLSI, Device Modelling.	1, 2	**CLO.4, CLO.23**
2	Basic analog blocks (current mirrors, and common-source).	1, 2	**CLO.4, CLO.23**
3	Basic analog blocks (common-drain, and common-gate).	1, 2	**CLO.4, CLO.23**
4	Basic analog blocks (cascode-different pair).	1, 2	**CLO.4, CLO.23**
5	Frequency Response	1, 2	**CLO.4, CLO.23**
6	Stability and frequency	1, 2	**CLO.4, CLO.23**
7	Midterm exam		
8	Introduction to operational amplifier.	1, 2	**CLO.4, CLO.23**
9	operational amplifier (basics, and two-stage, miller)	1, 2	**CLO.4, CLO.23**
10	operational amplifier (symmetrical, telescope, folded, and cascode)	1, 2	**CLO.4, CLO.23**
11	Voltage and current references	1, 2	**CLO.4, CLO.23**
12	Power references and assumptions	1, 2	**CLO.4, CLO.23**
13	Introduction to operational amplifier.	1, 2	**CLO.4, CLO.23**

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**CLO.4**	Develop appropriate experimentation and/or simulation, to analyze, interpret data, assess, and evaluate findings, and using statistical analyses and objective engineering judgment to draw conclusions.
PL13	Design and implement elements, modules, sub-systems or systems using technological and professional tools.	**CLO.23**	Design elements, modules, sub-systems, or systems in electrical/electronic/digital engineering

Title	Name	Signature
Course coordinator		
Head of Department	**Ass. Prof. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE 4271 **Course Title: Selected Topics in Electronics**

34. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE 4271			
Prerequisite	--			
Year/level	Fourth year / Second Semester (2^{nd} Semester)			
Specialization	**Minor**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	3

35. Course Aims

No.	Aim
1	Apply Communication and electronic engineering based on physical sciences and mathematics. (AM1)
2	Identify, analyze, and solve practical problems, making use of appropriate engineering tools, programs and techniques. (AM3)

36. Course Learning Outcomes (LOs)

CLO.8	Practice research techniques and methods of investigation as an inherent part of learning.
CLO.20	Design, an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

37. Course Contents

Topics	Week
Developments in Micro-electronics. (1)	1

Developments in Micro-electronics. (2)	2
Developments in Nanoelectronics. (1)	3
Developments in Nanoelectronics. (2)	4
Micro electrochemical Technologies (1)	5
Micro electrochemical Technologies (2)	6
Midterm Exam.	7
Nano electrochemical Technologies	8
Integrated Circuit Design (1)	9
Integrated Circuit Design (2)	10
Electronic designs (1)	11
Electronic designs (2)	12
Methods of using computers in design	13
Practical Exams	14
Final Exam.	15

38. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods

	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.8	√	√			√							
CLO.20	√	√			√							

39. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

40. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports / Sheets	CLO.8, CLO.20
3	Quiz 1 / Quiz 2	CLO.8, CLO.20
4	Mid-term Exam	CLO.8, CLO.20
5	Final Exam	CLO.8, CLO.20

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quiz	4 & 10
4	Mid-term Exam	9
5	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			5%	5
	Quiz			5%	5

	Mid-term exam			20%	20
Final Exam				60%	60
Total				100%	100

41. List of References

[1] Quantum-Based Electronic Devices and Systems, Selected Topics in Electronics and Systems, Vol 14, 1998.

42. Facilities required for teaching and learning

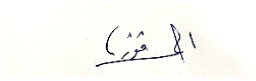
Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

43. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Developments in Micro-electronics.	1	CLO.8, CLO.20
2	Developments in Nanoelectronics.	1	CLO.8, CLO.20
3	Micro electrochemical Technologies	1, 2	CLO.8, CLO.20
4	Nano electrochemical Technologies	1, 2	CLO.8, CLO.20
5	Integrated Circuit Design	2	CLO.8, CLO.20
6	Electronic designs	2	CLO.8, CLO.20
7	Methods of using computers in design	2	CLO.8, CLO.20

44. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO.8	Practice research techniques and methods of investigation as an inherent part of learning.
PLO12	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO.20	Design, an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

Title	Name	Signature
Course coordinator		
Head of Department		**Ass. Prof. Ahmed Fawzy**
Date of Approval	**16/09/2024**	

Course Specification

Course Code: ECE4272 **Course Title:** Information theory

45. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	ECE4272			
Prerequisite	----------			
Year/level	Fourth year / Second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	0	5

46. Course Aims

No.	Aim
1	Identify, analyse, and solve practical problems, making use of appropriate engineering tools, programs and techniques (AM.3)

47. Course Learning Outcomes (LOs)

CLO.26	Measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.
CLO.29	analyzing electronic and communication systems

48. Course contents

Topics	Week

Foundations: Probability, Uncertainty, and Information sources, and Entropies Defined.	1
Relative Entropy, and Mutual Information and Why they are Measures of Information.	2
Source Coding Theorem; Prefix, Variable, and Fixed-Length Codes	3
First and second Shannon theorem, and Shannon coding	4
Huffman Codes, Some Comments on Huffman Codes, Optimality of Huffman Codes	5
Shannon–Fano–Elias Coding, Competitive Optimality of the Shannon Code.	6
Mid Term Exam	7
Channel Encoding: Channel Types, Properties, Noise	8
Channel Capacity theorem	9
Continuous Information; Density; Noisy Channel Coding Theorem.	10
Convolutional Codes	11
Viterbi Algorithm	12
Trellis Decoding of Linear Block Codes	13
Turbo Codes, and design of Turbo Code	14
Final Exam	15

49. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods

	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.26	√	√			√							
CLO.29	√				√	√						

50. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

51. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Reports	CLO.26
3	Quiz	CLO.26
4	Mid-term Exam	CLO.26, CLO.29
5	Final Exam	CLO.26, CLO.29

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	6,11
3	Quiz	7,12
4	Mid-term Exam	9
5	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	40%	40	10%	10
	Quiz			10%	10

	Mid-term exam			20%	20
Final Exam				60%	60
Total				100%	100

52. List of References

- B.P. Lathi, Modern Digital and Analog communication systems, 2018.
- LEON W. COUCH II , Digital And Analog Communication systems, 2017

53. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

54. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Foundations: Probability, Uncertainty, and Information sources, and Entropies Defined.	1	CLO.26, CLO.29
2	Relative Entropy, and Mutual Information and Why they are Measures of Information.	1	CLO26
3	Source Coding Theorem; Prefix, Variable, and Fixed-Length Codes	1	CLO.26
4	First and second Shannon theorem, and Shannon coding	1	CLO.26

5	Huffman Codes, Some Comments on Huffman Codes, Optimality of Huffman Codes	1	CLO.26
6	Shannon–Fano–Elias Coding, Competitive Optimality of the Shannon Code.	1	CLO.26
7	Mid Term Exam	1	CLO.26
8	Channel Encoding: Channel Types, Properties, Noise	1	CLO.26
9	Channel Capacity theorem	1	CLO.26,CLO.29
10	Continuous Information; Density; Noisy Channel Coding Theorem.	1	CLO.26
11	Convolutional Codes	1	CLO.26,CLO.29
12	Viterbi Algorithm	1	CLO.26,CLO.29
13	Trellis Decoding of Linear Block Codes	1	CLO.26,CLO.29
14	Turbo Codes, and design of Turbo Code	1	CLO.26,CLO.29
15	Final Exam	1	CLO.26,CLO.29

55. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PLO14	Measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	CLO.26	Measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application
PLO16	analyzing electronic and communication systems	CLO.29	analyzing electronic and communication systems

Title	Name	Signature
Course coordinator		
Head of Department	**Ass. Prof. Ahmed Fawzy**	
Date of Approval	**16/09/2023**	

Course Specification

Course Code: ECE 4273 **Course Title: Selected topics in microwave**

56. Basic information

Program Title	Electronics and Communication Engineering Depart.			
Department offering the program	Electronics and Communication Engineering Depart.			
Department offering the course	Electronics and Communication Engineering Depart.			
Course Code	**ECE 4273**			
prerequisite	----			
Year/level	Fourth year / second Semester (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

57. Course Aims

No.	Aim
1	Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management. (AM3)

58. Learning Outcomes (LOs)

CLO.8	Practice research techniques and methods of investigation as an inherent part of learning
CLO.20	Design, an electronic system
CLO.22	Analyze an electronic/digital system

59. Course Contents

Topics	Week
Revision on microwave	1

Revision on antenna	2
Smart antenna	3
Microwave Resonator	4
Microwave Filters	5
Oscilter phase noise	6
Mid Term Exam	7
RF Oscilter	8
Frequency Multiplyer	9
Mixer	10
Field Effect Transistor	11
Microwave integreted circuit	12
System aspects of antenna	13
Practical exam	14
Final exam	15

60. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods

	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO.8	√	√	√			√	√					
CLO.20	√	√										
CLO.22	√	√					√				√	

61. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	√

62. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-------
2	Sheets	CLO.8, CLO.20, CLO.22
3	Quiz	CLO.8, CLO.20, CLO.22
4	Mid-term Exam	CLO.8, CLO.20, CLO.22
5	Final Exam	CLO.8

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	5&11
4	Mid-term Exam	9
5	Oral/ Practical Exam	15
6	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Attendance	40%	40	5%	5
	Quiz			15%	15
	Mid-term exam			20%	20
Final Exam		60%	60	60%	60
Total				100%	100

63. List of References

[1] Pozar, David M. *Microwave engineering*. John wiley & sons, 2011..

64. Facilities required for teaching and learning

Lecture/Classroom
White board
Data show
Laboratory Usage

65. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	Revision on microwave	2	CLO.8, CLO.20, CLO.22
2	Revision on antenna	2,1	CLO.8, CLO.20, CLO.22
3	Smart antenna	2	CLO.8, CLO.20, CLO.22
4	Microwave Resonator	2,1	CLO.8, CLO.20, CLO.22
5	Microwave Filters	2	CLO.8, CLO.20, CLO.22
6	Osciltor phase noise	1	CLO.8, CLO.20, CLO.22
7	Mid term exam		
8	RF Osciltor	1	CLO.8, CLO.20, CLO.22
9	Frequency Multiplyer	1	CLO.8, CLO.20, CLO.22

10	Mixer	1	CLO.8, CLO.20, CLO.22
11	Field Effect Transistor	1	CLO.8, CLO.20, CLO.22
12	Microwave integreted circuit	1	CLO.8, CLO.20, CLO.22
13	System aspects of antenna	1	CLO.8, CLO.20, CLO.22
14	Practical exam		
15	Final exam		

66. Matrix of Program LOs with Course Los

Program Los		Course Los	
PL5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO.8	Practice research techniques and methods of investigation as an inherent part of learning
PL12	Design model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO.20	Design, an electronic system
		CLO.22	Analyze an electronic/digital system

Title	Name	Signature
Course coordinator		
Head of Department	**Assoc. Prof. Dr. Ahmed Fawzy**	
Date of Approval	**16/09/2024**	

Course Specification

Course Code: HUM 3105 **Course Title:** Management and Marketing

67. Basic information

Program Title	Electronic and communication Engineering Department			
Department offering the program	Electronic and communication Engineering Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	HUM 3105			
prerequisites	None			
Year/level	Forth year / first Semester (5^{th}level)			
Specialization	**Minor**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1	0	3

68. Course Aims

No.	Aim
1	Identify the project management methods, and efficiently utilize available resources and learn design management techniques. And Manage time efficiently by assigning specific tasks within designated time schedules to accomplish work within the specified deadlines (AM6)

69. Learning Outcomes (LOs)

CLO1	Identify environmental factors that affect both global and domestic marketing decisions.
CLO3	Analyze the importance of social responsibility and ethics on marketing.
CLO14	Use creativity to Explain the concepts of the marketing mix in the development of marketing strategy and tactics.

4- course contents

Topics	Week
الشركات	1
الشيكات	2
Marketing force	3
Product	4
Product	5
Services	6
Promotion	8
Pricing	9
Forecasting	10
Resources mangment	11
Quality control	12
Decion making under uncertainty	13
Revision	14
Final Exam	15

5-Teaching and Learning methods

Course learning Outcomes	

(LOs)	Teaching and Learning Methods											
	Interactive lectures	Tutorials	Practical	Projects	Assignment	Research\reports	Self-Learning	Brain Storming	Modeling and simulations	Site Visits	Presentation	Discussion
CLO1	√	√									√	
CLO3	√	√			√	√		√			√	
CLO14	√	√			√	√		√			√	

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	×
2	Online lectures and assignments	×

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Reports	CLO3,CLO14
2	Quizzes	CLO3,CLO14
3	Mid-term Exam	CLO1,CLO3
4	Final Exam	CLO1,CLO3,CLO 14

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Reports	Bi-weekly
2	Quizzes	Bi-weekly
3	Mid-term Exam	7
4	Final Exam	15

7.3 Weighting of Assessments			
	Assessment Method	**Weights%**	**Weights**
Teacher Opinion	Reports	20%	20
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

8. List of References

1. Course notes.
2. Essential books (text books) - Lamb, Hair and McDaniel, MKTG, South-Western Publishing U.S.A. 2009.
3. Recommended books. - Kotler, Philip, Kevin Lane Keller, Marketing management, Prentice hall, Europe,2008.
4. Periodicals, Web sites, etc http://marketing.about.com http://www.slideshare.net http://www.knowthis.com http://www.studymarketing.org Course Prof:Dr: - Kotler, Philip , Kevin Lane Keller ,Marketing management, Prentice hall, Europe,2008.

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

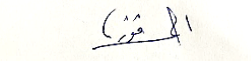
10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LO's
1	الشركات	1	CLO1
2	الشيكات	1	CLO1,
3	Marketing force	1	CLO1,CLO3,
4	Product	1	CLO3,CLO14
5	Product	1	,CLO3,CLO14
6	Services	1	,CLO3,CLO14
7	Mid Term		CLO1,CLO3
8	Promotion	1	CLO3,CLO14
9	Pricing	1	CLO1,CLO3,CLO14

10	Forecasting	1	CLO1,CLO3,CLO14
11	Resources mangment	1	CLO1,CLO3,CLO14
12	Quality controls	1	CLO1,CLO3,CLO14
13	Decion making under uncertainty	1	CLO1,CLO3,CLO14
14	Revision	1	CLO1,CLO3,CLO14
15	Final Exam	1	CLO1,CLO3,CLO14

11. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
PL1	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO1	Identify environmental factors that affect both global and domestic marketing decisions.
		CLO3	Analyze the importance of social responsibility and ethics on marketing.
PL9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO14	Use creativity to Explain the concepts of the marketing mix in the development of marketing strategy and tactics.

Title	Name	Signature
Course coordinator	**Ass.Prof.Dr. Rehab Ali** **Dr. Yasser Abd elkhalq**	
Head of Department	**Ass. Prof. Ahmed Fawzy**	
Date of Approval	**16/9/2024**	