Course Specification	
Course Code: ECE 455	**Course Title:** Communication Electronics
Prerequisites	ELC 242 and ECE 342

(1) Basic information			
Program Title	Electronics and communication engineering		
Department offering the program	Electrical Engineering Dept.		
Department offering the course	Electrical Engineering Dept.		
Course Code	ECE 455		
Year/level	second term- 2022/2023 / 4thlevel		
Specialization	Major		
Teaching Hours	Total	Practical / Tutorial	Lectures
	3	2	2
Date of approval of Bylaw	2021		

(2) Course Aims	
No.	**Aims**
1.	Design of output circuits of classes A, B. Single and sequential tuning circuits. Voltage controlled oscillators. phase locked loop. Radio frequency amplifiers. intermediate frequency amplifiers. video amplifiers. Frequency conversion circuits and mixers. Amplitude modulation, frequency modulation, phase modulation, impulse modulation and detection circuits. Design of automatic gain control systems AGC. Design of tuning circuits. Transmitter and receiver circuits (Aim no.1 (PEO1) .)

(3). Learning Outcomes of Course (LOs)	
B2.1	Design and simulate communication electronics systems using computers.
B4.1	Estimate and measure the performance of an electronic and digital system and circuit under specific input excitation and evaluate its suitability for a specific application.
C1.1	Analysis and evaluate various communication electronics circuits.
C2.1	Implement communication techniques (analog and digital systems) through specific programs.

(4). Course Contents				
Week No.	**Topics**	**Lecture**	**Tutorial / Practical**	**Total**
1	Waveforms and electronic signals	2		2
2	'Black-box' Technique	2	2	4
3	Radio Receiver Architecture	2	2	4
4	RF and IF Amplifiers	2	2	4
5	Basic Sinusoidal Oscillators	2	2	4
6	RF Oscillators	2	2	4
7	**Midterm exam**			
8	Amplitude Modulation	2	2	4
9	Angle Modulation	2	2	4
10	Amplitude De-Modulation	2	2	4
11	Angle De-Modulation	2	2	4
12	Radio Receivers	2		2
13	Final Projects	2	2	4
14	Amplitude Modulation	2	2	4
15	**Practical exam (**Research and Project discussion**)**			
16	**Final exam**			
	Total	26	20	46

(5). Teaching and Learning methods	
No.	**Teaching Method**
1.	Interactive lectures (educational presentation)
2.	Active learning e.g. group discussion, brain storming, demonstration.
3.	Project based learning
4.	Case study
5.	Self-Learning

(6). Teaching and Learning methods of Disabled Students		
No.	**Teaching Method**	**Reason**
1.	Additional tutorial	
2.	Online lectures	

(7). Students Assessment

)7.1(Students Assessment Method		
No.	**Assessment Method**	**Los**
1	Attendance	
2	Reports	B2, B4, C1, C2
3	Quiz 1 / Quiz 2	B2, B4
4	mini project	B2, B4, C1, C2
5	Mid-term Exam	B2, B4
6	Final Practical Exam	B2, B4
7	Final Exam	B2, B4

)7.2 (Assessment Schedule		
No.	**Assessment Method**	**Weeks**
1	Attendance	Weekly
2	Reports/ Sheets	Weekly
3	Quiz 1 / Quiz 2	4 and 12
4	Mini project	14
5	Mid-term Exam	7
6	Final Practical Exam	15
7	Final Exam	16

)7.3 (Weighting of Assessments				
No.	**Assessment Method**	**Weights %**	**Weights**	
1	Attendance and class discussion	5%	5	
3	Quiz 1 / Quiz 2	5%	5	
4	Assignments	10%	10	50
5	Mid-term Exam	20%	20	
6	Final Practical Exam	10 %	10	
7	Final Exam	50%	50	
Total		100%	100	

(8). List of References

[1].	Robert Sobot (2020). Wireless Communication Electronics Introduction to RF Circuits and Design Techniques.
[2].	Principles of Electronic Communication Systems by Louis Frenzel (2007), McGraw-Hill Education.

(9). Facilities required for teaching and learning	
1.	Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
2.	Microsoft teams
3.	Data show
4.	Lab Facilities and simulation Software (Multisim)

(10).Matrix of Aims and LOs of the Course

No.	Topics	Aims	Los
1	Waveforms and electronic signals	1	B2.1, C1.1, C2.1
2	'Black-box' Technique		
3	Radio Receiver Architecture		
4	RF and IF Amplifiers		
5	Basic Sinusoidal Oscillators		B4.1, C1.1
6	RF Oscillators		
7	Frequency Shifting		
8	Amplitude Modulation		B4.1, C1.1, C2.1
9	Angle Modulation		
10	Amplitude De-Modulation		B4.1, C1.1, C2.1
11	Angle De-Modulation		
12	Radio Receivers		

(11). Matrix of Competencies/ Program LOs with Course Los

No.	Competences/ Program LOs	No.	Course Los
B2	Design, model and analyze an electrical/electronic/digi20tal system or component for a specific application; and identify the tools required to optimize this design.	**B2.1**	Design and simulate communication electronics systems using computers.
B4	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.	**B4.1**	Estimate and measure the performance of an electronic and digital system and circuit under specific input excitation and evaluate its suitability for a specific application.
C1	Analysis and evaluate of the different Communication systems.	**C1.1**	Analysis and evaluate various communication electronics circuits.
C2	Design and analysis of the electronic circuit applications.	**C2.1**	Implement communication techniques (analog and digital systems) through specific programs.

Title	Name	Signature
Course Coordinator		
Head of Department	Assoc. Prof. Eyad Saeed	
Date of Approval	2022/ 2023	