2023
TP-153

Course Specification
(Bachelor)

Course Title:	Communication Systems Lab
Course Code:	EE 1453
Program:	Electrical Engineering
Department:	Electrical Engineering
College:	College of Engineering
Institution:	Imam Mohammad Ibn Saud Islamic University
Version:	V5
Last Revision Date:	01-01-2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (8h level, 4th year)					
4. Course general Description:					
Introduction to Laboratory equipment such as oscilloscope and spectrum analyzer; Analog modulations AM, PM generation and detection; Digital modulation.					
5. Pre-requirements for this course (if any)**:**					
EE 1352					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
In this lab course the students will get hands-on experience to design, construct and analyze different Communication circuits. Students will learn, Analog Communications, AM, DSB, SSB and FM modulators and demodulators. Digital Communications, PAM. During this course the student will learn hand on experience on simulation software, Power Meter, Oscilloscope, frequency Counter, Functional Generators & Spectrum Analyzer.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning	-	-
3	Hybrid • Traditional classroom • E-learning	-	-
4	Distance learning	-	-

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	-
2.	**Laboratory/Studio**	30
3.	**Field**	-
4.	**Tutorial**	-
5.	**Others (specify)**	-
Total		30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
K1	Apply basic concepts of communications	1.1	Delivering Lectures Reading Manual Performing Experiments	Quizzes in class Midterm exam Final exam
K1	Translates academic theory into engineering applications	1.4	Delivering Lectures Reading Manual Performing Experiments	Midterm exam Final exam
2.0	**Skills**			
S2	Use Engineering judgement to draw Conclusions	6.7	Applying During Experiment Writing in report	Report Writing
S2	Instrument Operation & Selection	6.2	Performing During Experiment.	Final practical Exam Mid Practical Exam
S2	Use computer Engineering Tools	6.2	Delivering Lectures Group discussions during class Performing Experiments	Quizzes in class Midterm exam Final exam
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
V1	Put results as graphs or tabular forms	3.3	Report writing	Report Evaluation

C. Course Content

No	List of Topics	Contact Hours
1	Generation of AM Signal	2
2	Reception of AM Signals	2
3	Generation of FM Signal	2
4	Reception of FM Signal	2
5	Pulse Amplitude Modulation (Generation & Demodulation)	2
6	Pulse Code Modulation (Generation & Demodulation)	2
7	Delta Modulation (Generation & Demodulation)	2
8	Line Encoding	2
9	FSK Signal Generation	2
10	FSK Detection	2
11	PSK Signal Generation	2
12	PSK Synchronous Detection	2
13	ASK Signal Generation	2
14	ASK Signal Detection	2
15	Optical Fiber Transmission	2
16	Mid & Final Exams	4
Total		**34**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm 1	7th week	20%
2.	Reports	Every week	20%
3.	PreLab Quiz	Weekly	10%
4.	Quiz	10th Week	10%
5.	Final Exam	Final Exam week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Lab manual Given by University

	Communication Systems, Simon Haykins and Michael Moher, John Wiley and Sons Inc., 2008, Fifth Edition.
Supportive References	Given by teacher at different time during the course
Electronic Materials	Computer animations and Online resources supplied by the instructor.
Other Learning Materials	Using Software is Encouraged for Simulation Purpose other than that of Lab.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	SR 136 in Lab Room with 10-15 Students per Section
Technology equipment (projector, smart board, software)	Lab Equipment, Computers, Internet connection, Blackboard LMS software, data-show, and white board.
Other equipment (depending on the nature of the specialty)	Provided in the lab.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Indirect**
Effectiveness of Students assessment	**Students**	**Indirect**
Quality of learning resources	**Relevant Focus Group**	**Indirect**
The extent to which CLOs have been achieved	**Dept. Quality Committee**	**Direct**
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	