Academic Program Description Form

University Name: Diyala

Faculty/Institute: College of Engineering

Scientific Department: Communications Engineering

Academic or Professional Program Name: Bachelor

Final Certificate Name: bachelor of Science in Communications Engineering

Academic System: Course

Description Preparation Date: 6 – 7 – 2025

File Completion Date: 6 – 7 – 2025

Signature:

Head of Department Name: Assit. Prof. Dr. Mohammed S. Saleh

Date: 6 – 7 – 2025

Signature:

Scientific Associate Name: prof. Dr. Jabbar Kas.m Jabbar

Date: 6 – 7 – 2025

The file is checked by: Assist Prof Dr. Salah M. Farhan

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 6 – 7 – 2025

Signature:

Approval of the Dean

prof. Dr. Anees A. Khadom

1. Program Vision

The department going to develop the curriculum in line with modern scientific developments in the field of communications engineering in addition to completing all the special requirements of scientific laboratories in the department. We seek to improve the staffed of teaching by dispatching members of Department of postgraduate in both inside and outside the country, and configure the appropriate conditions for scientific research in order to get Degrees required to be a Department able to compete in its own right and marked with the corresponding sections only local of which or the Arab and international Our ambitions We aspire to open graduate studies for a master's certificate in the disciplines of engineering various communication to be Department of scientific expertise to attract local and international center of which to open the horizons of cooperation through conferences, consulting, training, scientific research and development through broad and orderly opening to the community.

2. Program Mission

Expanding educational base and their applications in modern field of telematics and communications across both the international network and devices and cellular all advanced communication systems form that meets the need of institutions, both belonging to the state or the private sector through education, training and rehabilitation input from Human Resources (students) and make them able to deal with modern techniques and working in different institutions efficiently and effectively serve our dear country march.

3. Program Objectives

Teach students studying in the department on techniques required in all areas of modern communication systems and their applications in scientific and field state departments. Qualify graduates capable of working in government departments and the private sector engineering staff specialist efficiently and effectively. Contribute to provide an advanced level of related activities and the realization of the institutions experience and lead to the fulfillment of their need of human resources in order to achieve their success and the evolution and continuation.

4. Program Accreditation

None

5. Other external influences

None

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution requirements	5	6	4.24%	
College requirements	9	20	14.20%	
Department requirements	46	115	81.56%	
Summer Training				Graduation Requirements
Others				

7. Program Description

Course Name	Course Code	Level/Year	Credit Hours	
			Practical	Theory
Democracy & human Rights	**U 101**	Second - First	-	2
Workshop skills	**COE 107**	Second - First	3	-
Computer skills	**U 103**	First - First	3	1
English Language	**U 104**	First - First	-	2
Engineering Drawing	**COE 106**	First - First	3	-
Mathematics -I	**E 101**	First - First	-	4
Mathematics -II	**E 102**	Second - First	-	4
Electronic Physics	**COE 104**	Second - First	-	4
C++ Programming	**COE 105**	Second - First	3	1
Digital Techniques	**COE103**	First - First	2	4
Electrical Engineering Fundamentals I	**COE 101**	First - First	2	6
Electrical Engineering Fundamentals II	**COE102**	Second - First	2	6
Arabic Language	**U 108**	Second - First	-	2
Signals and systems	**COE 201**	First - Second	2	3
Applied mathematics I	**COE 202**	First -Second	-	3
Electrical circuits	**COE 203**	First - Second	2	4
Electronic I	**COE 204**	First - Second	2	3
MatLab Programming	**COE 205**	First - Second	2	2

Electromagnetic fields I	**COE 206**	First - Second	-	3
Analog communication	**COE 207**	Second- Second	2	3
Applied Mathematics II	**COE 208**	Second- Second	-	3
Electronic II	**COE 209**	Second- Second	2	3
Probability and random processing	**COE 210**	Second -Second	-	5
Electromagnetic fields II	**COE 211**	Second -Second	-	3
Computer 2	**UD23**	Second -Second	2	1
English Language 2	UD21	Second -Second	-	2
Arabic Language 2	UD22	Second -Second	-	2
Ba'ath Regime Crimes in Iraq	UD24	First -Second	-	2
Engineering Economy	**E301**	First - Third	-	2
Engineering Analysis	**COE301**	First - Third	-	2
Digital Communication I	**COE302**	First - Third	2	3
Antenna Theory and Design	**COE303**	First - Third	2	3
Digital Signal Processing	**COE304**	First - Third	2	3
Microcontroller and DSP Systems	**COE305**	First - Third	2	2
Communication Electronics -I	**COE306**	First - Third	2	3
Optical Communication Systems	**COE307**	First - Third	-	2
Detection and Estimation Theory	**COE308**	Second -Third	-	3
Digital Communication II	**COE309**	Second -Third	2	3
Image Processing	**COE310**	Second -Third	2	2
Information Theory	**COE311**	Second -Third	-	3
Radar Systems	**COE312**	Second -Third	2	2
Computer Networks	**COE313**	Second -Third	2	2
Waves Propagation	**COE314**	Second -Third	-	2
Communication Electronics -II	**COE315**	Second -Third	2	2
Engineering Profession Ethics	**E401**	First - Fourth	-	1
Graduation Project	**E402**	Fourth	8	-
Microwave Engineering-I	**COE401**	First - Fourth	2	3
Modern Communication Systems	**COE402**	First - Fourth	-	3
Cellular Mobile Networks	**COE403**	First - Fourth	-	2
Cryptography for Communication Systems	**COE404**	First - Fourth	-	2
Satellite Communication Systems	**COE405**	First - Fourth	-	2
Microwave Engineering-II	**COE406**	Second - Fourth	2	3
Global Positioning Systems	**COE407**	Second - Fourth	-	2
Multimedia Communication	**COE408**	Second - Fourth	-	2
Telecom Switching Systems	**COE409**	Second - Fourth	-	2
Television and Broadcasting Systems	**COE410**	Second - Fourth	-	2

8. Expected learning outcomes of the program

Knowledge

A. Cognitive goals

A1. - Understanding and teaching the student the principles of how signal work and how to deal with communication algorithms.

A2- Enabling students to obtain knowledge and understanding in working on and designing signal and system .

A3- The student understands the methods of forming signal and system parts and their interconnection.

A4- Enabling students to obtain knowledge and understanding of designing everything related to optical signal and system.

A5- Enabling students to obtain knowledge and understanding of diagnosing faults and maintaining various signal and system devices.

A6- The student understands the foundations of solving communication problems, cellular networks, and etc.

Skills

A. The skills goals special to the program.

B1 - Explanation of communication principles topics by specialists in the subject, with an emphasis on the use of mathematics as a basis for understanding and learning.

B2 - Providing them with skills to solve practical problems related to various communication systems and algorithms for addressing and solving technical problems in various fields of Communication engineering.

B3 – Obtaining experience to explore and develop communication systems and its algorithms.

Ethics

A. Affective and value goals

C1- Enabling students to think and analyze topics related to the engineering framework, such as various logical circuits.

C2- Enabling students to think and analyze topics related to Communication systems related to the engineering framework.

C3- Enabling students to think and analyze topics related to solving practical problems.

9. Teaching and Learning Strategies

 Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.

 Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.

 Asking students a set of thinking questions during lectures, such as (what, how,

when, why) for specific topics.

10. Evaluation methods

- Daily exams with practical and scientific questions.
- Participation marks for difficult competition questions among students.
- Assigning grades to homework assignments and reports assigned to them.
- Semester exams for the curriculum in addition to the final exam.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Electronic & communications	Communications			1	
Assist. Prof.	Communications	Communications techniques			1	
Assist. Prof.	Electronic & communications	Communications			3	
Assist. Prof.	Electric Eng.	Electronic & communications			3	
Assist. Prof.	Physics	Electro=optics			1	
Assist. Prof.	Physics	Nano technology			1	
Assist. Prof.	Communications	Communications			1	
Assist. Prof.	Info. & Comm. Eng.	Image processing			1	
Assist. Prof.	Elect. & Electronic Eng.	Communications				1
Assist. Prof.	Electro-optics and laser	Optoelectronics			1	
Lecturer	Elect. & Electronic Eng.	Electronics			1	1
Lecturer	Communications	Communications			1	1

Assist. Lecturer	Communications	Communications			3	
Assist. Lecturer	Elect. & Electronic Eng.	Electronics			1	
Assist. Lecturer	Electronic & communications	Communications			2	
Assist. Lecturer	Electric Eng.	Electronic & communications			1	

Professional Development

Mentoring new faculty members

Faculty members are instructed to hold regular meetings and review questionnaires received from students with the Scientific Committee.

Professional development of faculty members

The teaching staff undergoes development through training, workshops, and seminars. Progress is evaluated by subject performance.

12. Acceptance Criterion

According to the rules and regulations of Ministry of Higher Education and Scientific Research.

13. The most important sources of information about the program

- College website.
- The department's website and contact the department by email.

14. Program Development Plan

- The courses are updated annually to keep up with developments of the world.
- The laboratories are also updated under academic curricula.
- Additionally, postgraduate programs are now being offered.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
fourth / second semester	**COE409**	**Telecom Switching Systems**	Basic	√	√	√	√	√	√	√		√	√	√	

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

Course Description Form

1. Course Name:
Telecom Switching Systems
2. Course Code:
COE409
3. Semester / Year:
Second – Fourth
4. Description Preparation Date:
24-4-2024
5. Available Attendance Forms:
None
6. Number of Credit Hours (Total) / Number of Units (Total)
30 h /
7. Course administrator's name (mention all, if more than one name)
Name: Assi. Prof. Marwa Mohammed Jawad Email: marwa_al-sultani_ENG@uodiyala.edu.iq
8. Course Objectives

Course Objectives	The telecom Switching System course aims to introduce the student to the basics and principles of the communications switching system, understand the basic elements of switching systems as well as computer-controlled switching systems, learn about traffic engineering and how to use it in the communications switching system, in addition to learning about communications networks and their types.

9. Teaching and Learning Strategies	
Strategy	**In this course, students are guided by:** • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. Encourage students to work in groups.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

First-second	4	Learn the basics and divisions of the switching and transmission system of communications and its basic technologies.	Basic of switching System, Telecommunication transmission, digital Transmission, Four wire circuits, FDM, TDM, PDH, SDH, PCM Transmission path & reception path, Transmission formats for 24-channel and 30-channel systems.	Lecture PDF power point Video	Daily exams + monthly exams
Third – seventh	10	Learn how the switching system of communications developed and the techniques of switching and controlling the system.	Evolution of Switching System. Electronic Space Division: SPC, Distributed SPC, Centralized Architecture, Network-stages. Time Division Switching. Control of Switching System: Call processing function, Common Control, stored Program Control. Signaling Techniques: In channel Signaling, Common Channel Signaling, Signaling Sytem-6 (SS6), Signaling System-7 (SS7).	Lecture PDF power point Video	Daily exams + monthly exams
Eighth-Twelfth	10	Learn the techniques of traffic engineering and the traffic load network	Traffic Engineering: Network Traffic Load and Parameters Grade of Service and Blocking Probability, Modeling switching Systems, Incoming Traffic and Service Time Characterizations, Blocking Models and Loss Estimates, Delay Systems, Traffic Measurement, Lost call System, Queuing System.	Lecture PDF power point Video	Daily exams + monthly exams
Thirteenth-Fifteenth	6	Learn the types of communication networks in the switching system of communications	Telecom Networks: Introduction, Analog Networks, Integrated Digital Networks, Integrated services Digital Networks, Cellular radio Networks, Intelligent Networks, Private Networks, Numbering, National Schemes, International Numbering, Numbering Plan for the ISDN , Public Data Networks, Charging, Routing, General, Automatic alternative routing, Numbering, Network Management, IN, VPN, B-ISDN Telecommunications Network, Management.	Lecture PDF power point Video	Daily exams + monthly exams

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc	
12. Learning and Teaching Resources	
Required textbooks (curcumin books, if any)	1. *Telecommunication Switching Systems and Networks, by Thiagarajan Viswanathan, PHI.* 2. *Telecommunication Systems Engineering, R. L. Freeman, 4/e, Wiley publication, 2010* 3. *Telecommunication Switching and Networks. By P.Gnanasivam, New Age International*
Main references (sources)	• Lectures given by the subject teacher • Books available in the college library
Recommended books and references (scientific journals, reports, etc.)	All the magazines and scientific journals related to communications switching systems, their components and applications
Electronic references, websites	All the websites that specialize in explaining communications switching systems