Communications Engineering Program

STUDY PLAN 2021

Sana'a University

Faculty of Engineering

Electrical Engineering Department

Communications Engineering and Networks

Program Specifications

Faculty of Engineering, Sana'a University

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Head of Department Quality Assurance Unit Dean of the Faculty Academic Development Assurance Center & Quality

Rector of Sana'a University

Communications Engineering and Networks Program Specifications

Program Identification and General Information	
Program Title	**Communications Engineering and Networks**
Host Element	**Sana'a University**
Responsible Department	**Electrical Engineering Department**
Other Departments with major Teaching Contributions	**Mechanical Engineering Department, Mechatronics Engineering Department**
Media of Instruction	**English Language**
Mode of Delivery	**Semesters**
Total credit hours needed for completion of the program	**174**
Length full time	**Five academic years (two terms each - full time)**
Award granted on completion of the Program	**Bachelor of Science in Communication Engineering and Electronics**
Location(s) where the program is offered	**Inside the University (Eng. Faculty)**
Approval date:	**October 2020**

Vision, Mission & Aims of the Department

Vision

Sustain the leadership locally and be excellence regionally in education and scientific research in the different fields of electrical Engineering.

Mission

Graduate qualified Engineers in Electric Power, communication and computer engineering in accordance with programs committed to the international quality standards. The Graduating Engineers handed with enough knowledge and skills necessary to meet the requirements of development as well as local and regional labor markets. Also, they able to self-development and proceed with contemporary issues. The department contribute to community wellness and the country development through scientific research, advisory services, and training and education programs.

Aims of the Department

1. Graduate high qualified engineers in electrical power, communication and computer engineering able to compete at national and regional levels.
2. Update undergraduate and post graduate programs and enhance the applied research environment to contribute in country development.
3. Establish partnerships with the public and private sectors and provide engineering consultancies, continuous training, teaching and awareness programs.
4. Improve the academic staff to student ratio as per standard.
5. Fill the gap in the number of assistance staff and laboratory technicians and implement training programs to enhance their skills.
6. Commit and uphold high ethical and professional conduct in the education and practice of engineering.

Program Mission

Prepare highly qualified graduates in Communication Engineering and Networks able to follow the contemporary issues in communication engineering technologies, keep on continuing education, consulting and research, compete in local and regional labor market.

Program Aims

1. strong foundation of basic sciences and mathematics and are able to apply this knowledge to analyze and solve engineering problems
2. broad theoretical as well as practical knowledge related to communication engineering specialization.
3. skills needed for designing, analyzing, and trouble-shooting communication circuits or systems

4. ability to use computer simulations tools, and software packages to design projects or systems to meet specified requirements
5. good communication skills, both orally and in writing, and ability to work effectively individually or as a team member.
6. An understanding of professional and ethical responsibility, abilities for critical thinking, life-long learning, and updating of technical knowledge while working as professional engineers

Graduate Attributes:

In addition to the general attributes of an electrical engineering, the graduates of Communications Engineering and Networks program should be able to:

1- Design, operate and maintain digital and analog communication, mobile communication, coding, and decoding systems.
2- Analyze, design and implement communication networks and communication transmitter and receiver.
3- Design, implement, maintain and evaluate the electronic systems.

Program Intended Learning Outcomes (PILOs):

A. Knowledge and Understanding:

Upon successful completion of an undergraduate Communication Engineering and Networks program, the graduates will be able to:

A1: Demonstrate an understanding of related knowledge in mathematics and science related to Communication Engineering and Networks program.
A2: Understand principles of design including elements, processes and/or systems related to Communication Engineering and Networks program.
A3: Acquire knowledge of contemporary issues.
A4: Understand professional and ethical responsibilities.

B. Intellectual/ Cognitive Skills

Upon successful completion of an undergraduate Communication Engineering and Networks program, the graduates will be able to:

B1:Identify, formulate and solve engineering problems related to Communication Engineering and Networks program.
B2:Analyze, interpret and evaluate data.
B3:Analyze electrical and communication systems and processes using appropriate modeling techniques

B4:Consider economic, social and environmental dimensions in engineering design related to Communication Engineering and Networks program.
C. Professional and Practical Skills **Upon successful completion of an undergraduate Communication Engineering and Networks program, the graduates will be able to:**
C1: Apply acquired knowledge in mathematics and science in solving engineering problems related to Communication Engineering and Networks program.
C2: Design electrical and communication components or systems to meet desired specifications and imposed constraints.
C3: Conduct tests related to Communication and Networks Engineering and interpret data.
C4: Use modern engineering techniques, skills and computing tools related to Communication Engineering and Networks program.
D. General / Transferable Skills **Upon successful completion of an undergraduate Communication Engineering and Networks program, the graduates will be able to:**
D1: Work effectively within teams.
D2: Engage in independent lifelong learning.
D3: Adopt professional and ethical responsibilities.
D4. Communicate effectively both orally and in written forms.
D5. Conduct searches of literature

System of Study	
Terms of study. Specify the structure of the academic year of study in the program, does it follow a year or semester, Total Credit hours), mode of delivery etc.,	174 Hours
Study Credit. Specify the program structure and the distribution of Credit and average for each component of the program. Therefore the program structure should specify: Total number of hours; core requirements; elective requirements, particularly any restriction on electives; the minimum and/or maximum credit points of certain elements of the program where applicable; the requirements for activities such as field studies or professional practice, and Specify how to calculate the student GPA, etc.	
Program Requirement	%
• **University Requirements.**	Hours 10 %
• **Faculty Requirements.**	Hours 3.4 %
• **Department Requirements.**	Hours 14.4%
• **Core Subjects**	Hours 72.2%
1. Admission Requirements: Specify the criteria as part of the admission process, such as percentage of secondary school, audition, placement tests, or interview.	
1- High School Certificate with not less than 80 % passing ratio.	
2- Screening test	
3- Student number capacity of 100 students per year	
2. Degree Requirements The purpose of this section is to describe how the way in which students progress through the program relates to the development/ achievement of the learning. (Progression Requirements in order to proceed to the next year or to obtain a degree).	
Year 1 to year 2:	Total Credit Hours for Year 1 (35 Hours)
Year 2 to year 3	Total Credit Hours for Year 2 (32 Hours)
Year 3 to year 4:	Total Credit Hours for Year 3 (38 Hours)
Year4 to year 5:	Total Credit Hours for Year 4 (41 Hours)
Year5 to obtain Degree	Total Credit Hours for Year 5 (28 Hours)
The specification of the degree requirements , which a student must fulfill in order to be eligible to graduate. E.g. total number of credit hours; GPA required for graduation,	

What awaits him/her if he/she did not achieve the accumulative GPA in semester or year ?.
If a student got an Academy leave, or stop the study in the program for whatever reason, what are the requirements for continuing his/her study in the program again?,
If the current version of the program is different from the previous one, where he/she studied, how you will deal with him/her with regard to the requirements of graduation?,
What are the requirements for graduation from the program for the student transferring from another program, from the same university or from another university? Etc..

Course Coding Abbreviations:

E-stands for Electrical Engineering Department
EE-stands for common courses between the programs
PM-stands for Electrical Power and Machine Engineering Program
CN-stands for Communication and Network Engineering Program
CC-stands for Computer and Control Engineering Program
UR-stands for university requirement
FR-stands for faculty requirement
BR- stands for department requirement
ME-stands for courses offered by Mechanical Engineering Department

Study Plan 2020

The structure and content of the program should be consistent with the University's policy Structure and Requirements of the Awarded Bachelor's Degree and related to University policies.

Study Plan by Requirements:

University Requirements

No	Course No.	Course Name	اسم المقرر	CH	L	T	P
				س. م	م	ت	ع
1	UR001	Arabic Language 1	لغة عربية1	2	2	0	0
2	2UR00	English Language 1	لغة انجليزية 1	2	2	0	0
3	3 UR00	Computer Skills	مهارات حاسوب	3	2	0	2
4	4UR00	Arabic Language 2	لغة عربية 2	2	2	0	0
5	5UR00	English Language 2	لغة انجليزية 2	2	2	0	0
6	6 UR00	Islamic Culture	ثقافة اسلامية	2	2	0	0
7	7UR00	Arabic Israel Conflict	الصراع العربي الاسرائيلي	2	2	0	0
8	8 UR00	National Culture	الثقافة الوطنية	2	2	0	0
Total				17	16	0	2

Faculty Requirements

No	Course No.	Course Name	اسم المقرر	CH	L	T	P
				س.م	م	ت	ع
1	FR001	Mathematics 1	رياضيات 1	3	2	2	0
2	FR002	Engineering Physics	فيزياء هندسية	4	2	2	2
3	FR003	Mathematics 2	رياضيات 2	3	2	2	0
4	FR304	Engineering Project Management	إدارة مشاريع هندسية	2	1	2	0
5	FR305	Entrepreneurship & Communication Skill	ريادة اعمال ومهارات تواصل	2	1	2	0
Total				14	8	10	2

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Basic Requirements

No.	Course No.	Course Name	اسم المقرر	CH	L	T	P
				س.م	م	ت	ع
1.	BR002	Engineering Workshop	ورش هندسية	3	2	0	2
2.	BR003	Engineering Drawing	رسم هندسي	3	1	0	4
3.	BR007	Engineering Mechanics	ميكانيكا هندسية	3	2	2	0
4.	BR111	Scientific English	انجليزي علمي	2	2	0	0
5.	BR112	Technical Writing	تقارير فنية	2	2	0	0
6.	BR121	Linear Algebra	جبر خطي	3	2	2	0
7.	BR122	Differential Equations	معادلات تفاضلية	3	2	2	0
8.	BR223	Engineering Mathematics	رياضيات هندسية	3	2	2	0
9.	BR131	Probability and Statistics for Engineers	الاحتمالات والاحصاء للمهندسين	2	2	0	0
Total				24	17	8	6

Elective Courses

No.	Elective No.	Course Name	اسم المقرر	Credit	Lec.	Tu.	Pr.	Level/Semester	CODE
1.	Elective 1	Satellite Communications and Radar Systems	اتصالات الساتالايت وأنظمة الرادار	3	2	2	-	4th Level/1st Semester	CNE331
		Telecommunication Switching and Signaling	تحويل الاتصالات والاشارات	3	2	2	-		CNE332
2.	Elective 2	Multimedia Communication	اتصالات متعددة الوسائط	3	2	2	-	4th Level/2nd Semester	CNE333
		Smart Antenna Systems	النظم الهوائية الذكية	3	2	2	-		CNE334
3.	Elective 3	Broadband Networks	الشبكات ذات النطاق الواسع	3	2	2	-	5th Level/1st Semester	CNE447
		Wireless Sensor Networks	شبكات المجسات اللاسلكية	3	2	2	-		CNE448
4.	Elective 4	Emerging Wireless Technologies and RF Planning	التقنيات اللاسلكية الناشئة وتخطيط الترددات اللاسلكية	3	2	2	-	5th Level/2nd Semester	CNE436
		Telecommunication Policies and Standards	سياسات ومعايير الاتصالات	3	2	2	-		CNE437

Sana'a University
Faculty of Engineering
Electrical Engineering Department
Communications Engineering and Networks Program

Study Plan / First Year

Year	Sem.	Course code	Course Name	اسم المقرر	Credit	Lec.	Tu.	Pr.	Pre-Requ.	Co-Requ.
First Year	First Semester	BR002	Engineering Workshop	ورش هندسية	3	2	0	2	NA	(blank)
		FR002	Engineering Physics	فيزياء هندسية	4	2	2	2		(blank)
		FR001	Mathematics 1	رياضيات 1	3	2	2	0		(blank)
		UR001	Arabic Language 1	لغة عربية 1	2	2	0	0		(blank)
		UR002	English Language 1	لغة انجليزية 1	2	2	0	0		(blank)
		UR003	Computer Skills	مهارات حاسوب	3	2	0	2		(blank)
		UR007	Arabic Israeli Conflict	الصراع العربي الاسرائيلي	2	2	0	0		(blank)
	First Semester Total				19	14	4	6	First Total	
	Second Semester	BR003	Engineering Drawing	الرسم الهندسي	3	1	0	4	FR001	NA
		BR007	Engineering Mechanics	ميكانيكا هندسية	3	2	2	0		NA
		FR002	Mathematics 2	رياضيات 2	3	2	2	0		NA
		UR004	Arabic Language 2	لغة عربية 2	2	2	0	0	UR001	NA
		UR005	English Language 2	لغة انجليزية 2	2	2	0	0	UR002	NA
		UR006	Islamic Culture	ثقافة إسلامية	2	2	0	0	NA	NA
		UR008	National Culture	الثقافة الوطنية	2	2	0	0		NA
	Second Semester Total				17	13	4	4	Second Total	
First Year Total					36	27	8	10	First Year Total	

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Study Plan / Second Year

Year	Sem.	Course code	Course Name	اسم المقرر	Credit	Lec.	Tu.	Pr.	Pre-Requ.	Co-Requ.
Second Year	First Semester	BR111	Scientific English	انجليزي علمي	2	2	0	0	UR002 UR005	NA
		BR121	Linear Algebra	الجبر الخطي	3	2	2	0	NA	NA
		CCE118	Logic Circuits	دوائر منطقية	3	2	0	2	UR003	NA
		PME111	Electrical Circuits 1	دوائر كهربائية 1	4	2	2	2	FR002	NA
		CCE151	Programming Language 1 (Python)	لغة برمجة 1 (بايثون)	3	2	0	2	UR003	NA
	First Semester Total				15	10	4	6	First Total	
	Second Semester	BR112	Technical Writing	تقارير فنية	2	2	0	0	UR002 UR005	NA
		BR122	Differential Equations	المعادلات التفاضلية	3	2	2	0	BR121	NA
		PME112	Electrical Circuits 2	دوائر كهربائية 2	4	2	2	2	PME111	NA
		PME113	Electronics 1	الكترونيات 1	4	2	2	2	PME111	PME112
		CCE152	Programming Language 2 (C/C++)	لغة برمجة 2 (سي/سي++)	3	2	0	2	CCE141	NA
	Second Semester Total				16	10	6	6	Second Total	
Second Year Total					31	20	10	12	Second Year Total	

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Study Plan / Third Year

Year	Sem.	Course code	Course Name	اسم المقرر	Credit	Lec.	Tu.	Pr.	Pre-Requ.	Co-Requ.
Third Year	First Semester	BR223	Engineering Mathematics	الرياضيات الهندسية	3	2	2	0	BR122 BR121 FR001	(blank)
		CNE211	Electromagnetic Field Theory 1	نظرية المجالات الكهرومغناطيسية 1	3	2	2	0	FR002 BR223	NA
		CCE238	Microprocessors & Assembly Language	المعالجات الدقيقة ولغة التجميع	3	2	2	0	CCE143 CCE112 PME113	NA
		BR131	Probability and Statistics for Engineers	الاحتمالات والاحصاء للمهندسين	2	2	0	0	BR121 BR003	NA
		CNE214	Signals and Systems	إشارات ونظم	3	2	0	2	PME112 BR122	PME224
		PME214	Electronics 2	الكترونيات 2	4	2	2	2	PME113	NA
	First Semester Total				18	12	8	4	First Total	

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	Second Semester	CNE212	Electromagnetic Field Theory 2	نظرية المجالات الكهرومغناطيسية 2	3	2	2	0	BR223 FR002 PME110	NA
		CNE221	Communication Principles	مبادئ الاتصالات	4	2	2	2	BR131 CNE216	PME113
		CNE241	Electronic Systems Design	تصميم نظم الكترونية	4	2	2	2	PME214	(blank)
		PME225	Electrical Machines	ألآت كهربائية	4	2	2	2	PME11 PME112	NA
		PME223	Electrical Measurements and Instrumentations	القياسات الكهربائية وتجهيزاتها	4	2	2	2	PME214 PME112	(blank)
	Second Semester Total				19	10	10	8	Second Total	
Third Year Total					37	22	18	12	Third Year Total	

Study Plan / Fourth Year

Year	Sem.	Course Code	Course Name	اسم المقرر	Credit	Lec.	Tu.	Pr.	Pre-Requ.	Co-Requ.
Fourth Year	First Semester	CNE322	Waves Propagation and Antennas	انتشار موجات وهوائيات	3	2	2	0	CNE211	NA
		CNE323	Digital Communications	اتصالات رقمية	4	2	2	2	BR131 CNE216 CNE221	NA
		CCE339	Control Systems	نظم تحكم	4	2	2	2	BR007 PME113 CCE231	NA
		CNE342	Communication Networks 1	شبكات اتصالات 1	4	2	2	2	CNE221	(NA
		CNE315	Digital Signal Processing	معالجة الاشارة الرقمية	4	2	2	2	CNE216 CNE221 CCE152	NA
		CNE33X	Elective Course 1	مقرر اختياري 1	3	2	2	0	NA	(blank)
		CCE334	Embedded Systems	أنظمة مدمجة	3	2	0	2	CCE214 CCE143 CCE112 PME214	NA
	First Semester Total				**25**	**14**	**12**	**10**	First Total	
	Second Semester	CNE324	RF and Microwave Engineering	هندسة موجات دقيقة	3	2	2	0	CNE212), (CNE322)	NA
		CNE325	Electronic Communications	اتصالات الكترونية	4	2	2	2	CNE221	NA
		CNE343	Communication Networks 2	شبكات اتصالات 2	4	2	2	2	CNE342	NA
		CNE33X	Elective Course 2	مقرر اختياري 2	3	2	2	0	NA	NA
		FR304	Engineering Project Management	إدارة مشاريع هندسية	2	2	0	0	BR232	NA
		FR305	Entrepreneurship & Communication Skill	ريادة اعمال ومهارات تواصل	2	1	2	0		
	Second Semester Total				**18**	**11**	**10**	**4**	Second Total	

Fourth Year Total		**43**	**25**	**22**	**14**	**Fourth Year Total**

Study Plan / Fifth Year

Year	Sem.	Course code	Course Name	اسم المقرر	Credit	Lec.	Tu.	Pr.	Pre-Requ.	Co-Requ.
Fifth Year	**First Semester**	CNE426	Optical Communications	اتصالات ضوئية	4	2	2	2	CNE212 CNE221	NA
		CNE435	Mobile Communications	اتصالات متنقلة	4	2	2	2	NA	NA
		CCE454	Information Theory and Coding	نظرية المعلومات والترميز	3	2	2	0	BR131 CNE323	NA
		CNE44X	(Elective 3)	(مقرر اختياري 3)	3	2	2	0	CNE342 CNE343	CNE435
		PME415	Graduate Project 1	مشروع التخرج 1	2	2	0	0	NA	NA
	First Semester Total				**16**	**10**	**8**	**4**	First Total	
	Second Semester	CNE445	Information and Network Security	أمنية المعلومات والشبكات	3	2	2	0	CCE152	NA
		CNE429	Communication System	نظم اتصالات	3	2	2	0	CNE323	NA
		CNE43X	Elective Course 4	مقرر اختياري 4	3	2	2	0	CNE435	NA

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		PME416	Industrial Training	تدريب عملي	3	1	0	4	NA	NA
		PME415	Graduate Project 2	مشروع التخرج 2	3	2	2	0		NA
	Second Semester Total				**51**	**9**	**8**	**4**	Second Total	
Fifth Year Total					**31**	**91**	**16**	**8**	**Fifth Year Total**	