

Electrical Engineering Department B.Sc. Program Specifications

A. Basic Information

1. Program Title: Communication and Computer Engineering
2. Program Type: Single Double Multiple
3. Department(s) Offering the Program: Electrical Engineering Department of Nahda University
4. Coordinator:
5. External Evaluator:
Prof. Dr. XXXXX
6. Program commencement: 2012-2013

B. Professional Information

Attributes of Communication and Computer Engineering graduate:

In addition to the general attributes of the graduate of faculty of engineering Nahda University the graduate of Communication and Computer Engineering department should be able to:

- A. Apply knowledge of logical skills suitable to the Communication and Computer Engineering disciplines
- B. Recognize, identify, design, implement and evaluate the basic requirements of different kinds of Communication and Computer based system
- C. Use and develop general Communication and Computer software tools professionally
- D. Investigate the operations and optimize all parameters of Communication and Computer projects then implement the project in a cost saving design
- E. Talking the principles of electrical and electronic problems using electrical system analysis tool and techniques
- F. Point out the concepts of business and management tools relevant to Communication and Computer Engineering
- G. Design and implement various types of Communication and Computer networks and programs skills

1. Program Aims

The bachelor of Communication and Computer Engineering department students should be able to

1. To build the student knowledge of basic science, engineering concept, logical, business and management skills and up to date tools which are related to Communication and Computer Engineering problems
2. Enhance the student practical skills in analysis, design, optimize, implement, construction and evaluate electrical, communication, electronic and computer based projects

3. Improve the student soft, presentation and language skills to enable him contacting customers, suppliers and internal and external partners

2. Intended Learning Outcomes (ILOs)

a. Knowledge and Understanding

In addition to general Knowledge and understanding of faculty of engineering, Nahda University graduation program, Communication and Computer Engineering Program should recognize and define the following:

- a1. Explain key concepts, laws, and problem-solving processes in mathematics and basic sciences.
- a2. Explain key concepts from several areas of humanities and social sciences, and identify their relationship to electrical engineering problems
- a3. Discuss key concepts and problem-solving techniques in different engineering disciplines, and identify their relationship to electrical engineering problems
- a4. Communication and Computer engineering concepts in the fields of electrical and electronic circuit analysis, logic design, embedded systems, signal processing, electrical measurement and testing, antenna and wave propagation, electrical materials, communication systems, machine and high level languages, computer organization and networks, operating systems, data base.
- a5. Principals of power systems, control theory and analysis, electrical machine, energy conversion, transformers and power electronics.
- a6. Judging the quality of Communication and Computer Systems.
- a7. Discover the current and up-to-date research topics in Electrical, Communication, Computer and Power Engineering.
- a8. Describe the formatting of data, image and graphics in order to be organized on different kinds of storage devices.

b. Intellectual Skills

In addition to the general Intellectual Skills of faculty of engineering, Nahda University graduate, Communication and Computer Engineer should be able to:

- b1. Select proper mathematical methods, numerical techniques, computer models, modern technology, software packages and tools for solving problems in several technical areas of electrical engineering
- b2. Make an impact in the Communication and Computer professional community in order to be competitive in job market.
- b3. Create innovative solutions for practical industrial problems.
- b4. Assess the performance and functionality of various Communication and computer systems.
- b5. Construct and integrate Communication and Computer sub-systems for specific functions such as building analog and digital filters, designing computer networks, etc.
- b6. Select the suitable tools, methods and techniques for the analysis and design of Power, Communication, Computer and Information systems.
- b7. Evaluate the measurement test results conducted on Electrical, Electronic, Communication and computer systems.

c. Professional and Practical Skills

In addition to general Professional and Practical Skills of faculty of engineering, Nahda University graduate, Communication and Computer Engineering Program should be capable of conducting the following tasks:

- c1. Analyze and Solve problems in mathematics and basic sciences relevant to engineering practice, and apply the principles of probability and statistics
- c2. Demonstrate the incorporation of humanities and social sciences knowledge into the professional practice of electrical engineering
- c3. Solve problems in different engineering disciplines
- c4. Design and perform experiments as well as analyze and interpret the obtained results which are related to Electrical, Electronic, Communication and computer systems.
- c5. Combine suitable programming languages and web based systems tools in order to design and set the methodologies for data base systems.
- c6. Develop professional computer packages in order to achieve acceptable quality measures in software development to be used in the design and diagnostics of digital and analog communication, mobile communication, coding, and decoding systems.
- c7. Troubleshoot, maintain and repair almost all types of Electrical, Electronic, Communication and computer systems using the standard tools.

d. General and Transferable Skills

- d1. Function effectively as a member of a multidisciplinary team
- d2. Achieve effective communications
- d3. Use leadership skills to direct the efforts of a team.
- d4. Illustrate the ability for self-directed learning and entrepreneurial skills
- d5. Use the tools of the information technology to search for information and related literature
- d6. Explain the ability to manage work environment, time, tasks, resources, and constraints

3. Academic Standards

a. External References for Standards (Benchmarks)

1. National Academic Reference Standards (NARS).
2. Electrical and Computer Engineering Student Outcomes of Boston University.

b. Comparison of Provision to External References of NARS

	Knowledge and Understanding							
Program	a1	a2	a3	a4	a5	a6	a7	a8
NARS	A	g, i	e	c	d	f	h	-

	Intellectual Skills						
Program	b1	b2	b3	b4	b5	b6	b7
NARS	a, h, k	j	b, g, l	e	f	d	i

		Professional and Practical Skills						
Program		c1	c2	c3	c4	c5	c6	c7
NARS	A	General and Transferable Skills						
Program		d1	d2	d3	d4	d5	d6	
NARS		a	c	e	g, h	d, g, i	b, f	

4. Curriculum Structure and Contents

a. Program duration

10 main semesters, equivalent to 5 years (program can be completed in 9 main semesters)

b. Program structure

1. No. of total credit hours = 180 credit hours detailed as follows:

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6	Sem-7	Sem-8	Sem-9	Sem-10
Total	18	18	19	17	18	18*	18	19**	18	17
Compulsory	18	18	19	12	14	16*	12	15**	10	10
Elective	-	-	-	5	4	2	6	4	8	7

	Sem-1	Sem-2	Sem-3	Sem-4	Sem-5	Sem-6	Sem-7	Sem-8	Sem-9	Sem-10
University	1	4	6	1	-	2	-	-	-	-
Univ-Free-Elec	-	-	-	2	2	-	-	-	-	2
Faculty Compulsory	17	14	2	1	2	3	-	2	2	-
Fac -Elec-A	-	-	-	-	-	-	2	-	2	2
Fac -Elec-B	-	-	-	-	-	-	2	4	-	-
Fac -Elect-C	-	-	-	2	2	-	2	-	-	-
Electrical	-	-	11	11	12	12	12	12	6	6
Electrical -Elect	-	-	-	-	-	-	-	-	6	3
Field Training	-	-	-	-	-	1	-	1	-	-
Grad Project	-	-	-	-	-	-	-	-	2	4

2. No. of total credit hours of mathematics and basic sciences courses = 44 (24.4%)

3. No. of total credit hours of social sciences and humanities courses = 33 (18.3%)

4. No. of total credit hours of electrical engineering major courses = 94 (52.2%)

5. No. of total credit hours of electrical engineering specialized courses = 9 (5%)

6. No. of total credit hours of Practical/Field Training courses = 2 (1.1%)

- Field Training-1 after student completes sophomore (2nd) level*

- Field Training-2 after student completes junior (3rd) level**

7. Program levels = 5

- Freshman (1st) level, up to 36 credit hours

- Sophomore (2nd) level, from 36 up to 72 credit hours

- Junior (3rd) level, from 72 up to 108 credit hours

- Senior-1 (4th) level, from 108 up to 144 credit hours

- Senior-2 (5th) level, from 144 up to 180 credit hours

University Compulsory Courses (14 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
ENG 111	English-1	1	1	-	-	-	لغة إنجليزية-1
ENG 112	English-2	1	1	-	-	ENG 111	لغة إنجليزية-2
ENG 113	English-3	2	2	-	-	ENG 112	لغة إنجليزية-3
HUM 101	Human Rights	3	3	-	-	-	حقوق الإنسان
REM 101	Scientific Thinking	3	3	-	-	-	التفكير العلمي
ETS 101	Professional Ethics	1	1	-	-	-	أخلاقيات المهنة
MGT 101	Principles of General Management	3	3	-	-	-	مبادئ الإدارة

University Free Electives (6 credit hours)

Student freely selects 3 new courses (2 credit hours each) from all university, college or discipline courses

Engineering Compulsory Courses (45 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
MTH 111	Mathematics 1	3	2	2	-	-	رياضيات 1
MTH 121	Mathematics 2	3	2	2	-	MTH 111	رياضيات 2
STA 321	Statistics & Probability Theory	3	2	2	-	-	احصاء ونظرية احتمالات
PHY 112	Physics 1	3	2	1	2	-	فيزياء 1
PHY 122	Physics 2	3	2	1	2	PHY 112	فيزياء 2
MEC 113	Mechanics-1	3	2	2	-	-	ميكانيكا-1
MEC 126	Mechanics-2	3	2	2	-	MEC 113	ميكانيكا-2
CHE 123	Engineering Chemistry	3	2	1	2	-	كيمياء هندسية
CSK 116	Computer Skills	3	2	-	2	-	مهارات الحاسب الآلي
EVI 412	Environmental Impact of Projects	2	2	-	-	-	الأثر البيئي للمشروعات
DRW 114	Engineering Drawing & Projection-1	2	1	3	-	-	الرسم الهندسي والإسقاط-1
DRW 124	Engineering Drawing & Projection-2	2	1	-	3	DRW 114	الرسم الهندسي والإسقاط-2
HET 115	History of Engineering & Technology	1	1	-	-	-	تاريخ الهندسة والتكنولوجيا
MAN 125	Principles of Manufacturing	2	1	1	1	-	مبادئ هندسة التصنيع
PRM 512	Project Management	2	2	1	-	-	إدارة مشروعات
QCS 226	Monitoring & Quality Control Systems	1	1	-	-	-	نظم المراقبة وضبط الجودة
IEN 351	Engineering Economics	2	2	1	-	-	اقتصاد هندسي
TRW 215	Technical Report Writing	2	1	2	-	ENG112	إعداد التقارير الفنية
FTR 329	Field Training 1	1	-	-	6	-	تدريب ميداني 1
FTR 429	Field Training 2	1	-	-	6	-	تدريب ميداني 2

Faculty Elective Courses A (6 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
HUM 112	Music Appreciation	2	2	-	-	-	التذوق الموسيقي
HUM 113	Introduction to the History of Electrical izations	2	2	-	-	-	مقدمة فى تاريخ الحضارات
HUM 114	Trends In Contemporary Arts	2	2	-	-	-	الاتجاهات الفنية المعاصرة
HUM 115	Recent Egypt's History	2	2	-	-	-	تاريخ مصر الحديث
HUM 116	Heritage of Egyptian Literature	2	2	-	-	-	التراث الأدبي المصري
HUM 117	Arab & Islamic Electrical ization	2	2	-	-	-	الحضارة العربية والإسلامية
HUM 118	Literary Appreciation	2	2	-	-	-	التذوق الأدبي

Faculty Elective Courses B (6 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
ARB 111	Arabic Language	2	2	-	-	-	اللغة العربية
CPS 112	Communication & Presentation Skills	2	1	2	-	-	مهارات الاتصال والعرض
RES 113	Analysis & Research Skills	2	1	2	-	-	مهارات البحث والتحليل
NGO 114	Principles of Negotiation	2	2	-	-	-	مبادئ التفاوض
ACC 115	Introduction to Accounting	2	2	-	-	-	مقدمة في المحاسبة
BUS 116	Business Administration	2	2	-	-	-	إدارة الأعمال

Faculty Elective Courses C (6 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
CIV 211	Principles of Construction & Building Engineering	2	2	1	-	-	مبادئ هندسة التشييد والبناء
ARC 212	Arts & Architecture	2	2	1	-	-	الفنون والعمارة
ELP 213	Principles of Electrical Engineering	2	2	1	-	-	مبادئ الهندسة الكهربائية
ELE 214	Principles of Electronic Engineering	2	2	1	-	PHY 122	مبادئ الهندسة الإلكترونية
MED 215	Principles of Design & Manufacturing Engineering	2	2	1	-	-	مبادئ هندسة التصميم والتصنيع
MEP 216	Principles of Mechanical Power Eng	2	2	1	-	-	مبادئ هندسة القوي الميكانيكية

Electrical Engineering Compulsory Courses - Major (64 credit hours)

Code	Course Title	Cr.H	LC	Ex	TL	Prerequisites	اسم المقرر بالعربية
MTH 211	Mathematics 3	3	2	2	-	MTH 121	رياضيات 3
MTH 311	Mathematics 4	3	2	2	-	MTH 211	رياضيات 4
CIR 212	Electrical Circuits 1	2	2	1	1	PHY 122	دوائر كهربية 1
CIR 222	Electrical Circuits 2	2	2	1	1	CIR 212	دوائر كهربية 2
MEL 213	Electrical Measurements & Testing	3	2	1	2	CIR 212	قياسات واختبارات كهربية
EMT 221	Electrical Materials	3	2	2	-	PHY 122	مواد كهربية
EPW 413	Electrical Power	3	2	2	1	MCH 313	قوى كهربية
EMF 214	Electromagnetic Fields	3	2	2	-	MTH 211	مجالات كهرومغناطيسية
MCH 313	Electrical Machines & Transformers	3	2	2	1	CIR 222, EMF 214	آلات ومحولات كهربية
PWE 421	Power Electronics	3	2	1	1	DEV 322	الالكترونيات القدرة
CON 223	Energy Conversion	3	2	2	-	PHY 122, CIR 212	تحويل طاقة
DLC 312	Digital & Logic Circuits	3	2	1	2	CIR 222	دوائر رقمية ومنطقية
DEV 322	Electronic Devices	3	2	1	2	CIR 222	نبايط الكترونية
ELE 422	Electronics Engineering	3	2	2	1	DEV 322	هندسة الكترونيات
MIC 323	Microprocessors & Applications	3	2	1	2	DLC 312	المعالجة الدقيقة وتطبيقاتها
COM 423	Electrical Communications	3	2	2	1	SIG 324	الاتصالات الكهربية
SIG 324	Signal Analysis	3	2	2	1	CIR 222	تحليل اشارات
ORG 414	Computer Organization & Architecture	3	2	2	-	PRG 314	تنظيم وبنية الحاسب
PRG 314	Computer Programming	3	2	1	2	CSK 116	برمجة الحاسب
NET 417	Computer Networks	3	2	2		ORG 414	شبكات حاسبات
MOD 325	Modeling & Simulation of Engineering Systems	3	2	2	1	MTH 211	نمذجة ومحاكاة النظم الهندسية
CTL 416	Automatic Control	3	2	2	1	MOD 325	التحكم الآلي

Communication & Computer Engineering Compulsory Courses - Minor (24 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
MTH 411	Mathematics 5	3	2	2	-	MTH 311	رياضيات 5
DCM 511	Digital Communication System	3	2	2	1	COM 423	نظم الاتصالات الرقمية
MOB 521	Mobile Communications	3	2	2	-	COM 423	اتصالات المتحركات
DSA 425	Data Structure & Algorithms	3	2	2	-	PRG 314	هياكل البيانات والخوارزميات
SFT 513	Software Engineering	3	2	2	1	DSA 425	هندسة برمجيات
DBS 522	Data Base Systems	3	2	1	2	DSA 425	نظم قواعد البيانات
PRJ 519	Project 1	2	1	2	-		المشروع 1
PRJ 529	Project 2	4	-	4	4	PRJ 519	مشروع 2

Communication & Computer Engineering Elective A Courses- Minor (3 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
AWP 514	Antenna & Wave Propagation	3	2	2	1	EMF 214	هوائيات وانتشار موجات
DSP 515	Digital Signal Processing	3	2	2	1	SIG 324	معالجة الاشارات الرقمية
OPS 516	Operating Systems	3	2	2	-	PRG 314	نظم التشغيل

Communication & Computer Engineering Elective B Courses- Minor (6 credit hours)

Code	Course Title	CrH	LC	TE	TL	Prerequisites	اسم المقرر بالعربية
ICD 523	Integrated Circuits Design	3	2	2	1	ELE 422	تصميم الدوائر الإلكترونية المتكاملة
EMB 523	Embedded Systems	3	2	2	-	ELE 422	الأنظمة المدمجة
VLS 525	VLSI Technology	3	2	2	-	ELE 422	تكنولوجيا الدوائر المتكاملة عالية الكثافة
MCN 526	Microcontrollers & Applications	3	2	1	2	MIC 323	المتحكمات الدقيقة وتطبيقاتها
RDR 527	RADAR System	3	2	2	-	EMF 214	نظم الرادار
ACO 528	Acoustics	3	2	2	-	PHY 122	صوتيات
COD 531	Information & Coding Theory	3	2	2	-	COM 423	نظرية المعلومات والترميز
OPT 532	Optical Communications	3	2	2	1	COM 423	الاتصالات الضوئية
TEL 533	Telephony Systems	3	2	2	-	COM 423	أنظمة التليفونات
SAT 534	Satellite Communications	3	2	2	-	COM 423	الاتصالات بالأقمار الصناعية
CVS 535	Computer Vision	3	2	2	-	PRG 314	الرؤية بالحاسب
AIN 536	Artificial Intelligence & its Applications	3	2	2	1	SFT 513	الذكاء الاصطناعي وتطبيقاته

Communication & Computer Engineering Program Course - ILOs Matrix

Code	Knowledge and Understanding								Intellectual Skill							Professional and Practical Skills							General and Transferable Skills					
	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	b5	b6	b7	c1	c2	c3	c4	c5	c6	c7	d1	d2	d3	d4	d5	d6
MTH 111	X								X	X		X			X	X	X											
MTH 121	X								X	X		X				X	X											
STA 321	X								X			X				X												
PHY 112	X									X						X		X	X									
PHY 122	X										X					X		X										
MEC 113	X					X				X		X				X	X		X									
MEC 126	X					X				X		X				X	X		X									
CHE 123	X										X					X	X		X									
CSK 116			X						X	X	X					X	X	X	X							X		
EVI 412														X			X								X			
DRW 114				X						X								X										
DRW 124										X	X	X					X	X										
HET 115				X		X	X						X					X	X							X		
MAN 125	X			X	X					X	X	X	X				X	X										
PRM 512				X													X								X	X		
QCS 226					X								X							X								
IEN 351		X								X							X											
TRW 215											X													X	X			
FTR 329				X																				X	X	X	X	
FTR 429			X	X																				X	X	X	X	

Code	Knowledge and Understanding								Intellectual Skill							Professional and Practical Skills							General and Transferable Skills					
	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	b5	b6	b7	c1	c2	c3	c4	c5	c6	c7	d1	d2	d3	d4	d5	d6
ELP 213				x										x	x								x		x			
ELE 214				x		x	x				x		x	x								x		x			x	
Eng-Elc-A3				x		x	x				x		x	x								x		x			x	x
MTH 211	x								x							x												
MTH 311	x								x							x												
CIR 212	x			x			x			x		x	x						x			x						
CIR 222	x			x		x	x			x	x	x	x	x	x					x			x					
MEL 213				x		x	x			x			x	x	x					x			x					
EMT 221				x		x	x			x			x		x					x		x		x		x		x
EPW 413					x		x				x			x					x				x	x	x	x	x	x
EMF 214					x		x												x				x	x	x	x	x	x
MCH 313					x		x				x			x						x			x	x	x	x	x	x
PWE 421					x		x				x			x						x				x	x	x	x	x
CON 223					x		x													x				x	x	x	x	x
DLC 312				x		x	x	x			x			x						x				x		x		x
DEV 322				x			x	x			x	x	x			x				x			x					
ELE 422				x			x	x			x	x	x			x				x			x					
MIC 323				x		x		x			x	x			x					x		x		x		x		x
COM 423				x		x	x	x			x	x	x	x	x					x				x				
SIG 324				x			x				x											x						
ORG414				x	x		x	x					x							x				x		x		x
PRG 314				x	x		x	x			x		x		x					x	x		x					x
NET 417				x			x				x			x						x				x			x	x
MOD 325					x		x					x			x					x				x	x	x	x	x
CTL416					x		x					x			x					x				x	x	x	x	x
MTH 411	x								x							x												
DCM 511				x		x	x				x		x	x						x				x				
MOB 521				x		x	x				x		x	x						x				x				
DSA 425				x			x	x				x	x	x						x	x	x		x		x		x
SFT 513				x			x	x			x			x						x		x		x		x		x
DBS 522				x			x	x				x	x	x						x	x	x		x		x		x
PRJ 519					x	x	x				x	x	x	x	x					x	x	x	x	x	x	x	x	x
PRJ 529					x	x	x				x	x	x	x	x					x	x	x	x	x	x	x	x	x
DSP 515				x		x	x	x			x			x	x					x		x						
CVS 535				x		x	x	x			x	x		x						x		x						
SAT 534						x	x	x			x									x				x				
AIN 536						x		x			x		x		x													
OPS 516				x		x	x	x			x			x							x	x		x				x

6. Program Admission Requirements

See Bylaws and Study Regulations, Section 3, Articles 15 -20

7. Regulations for Progression and Program Completion

See Bylaws and Study Regulations, Sections 2 – 5

8. Evaluation of Program Intended Learning Outcomes

Evaluator	Tool	Sample
1- Senior students 2- Alumni 3- Stakeholders (Employers)	1. Survey 2. Personal meeting	
4-External Evaluator(s) (External Examiner(s))	1. Review academic regulations 2. Review course specifications & reports 3. Review course files 4. Meet with course coordinators 5. Meet with students 6. Examine resources 7. Meet with administration 8. Prepare an evaluation report	

Annex-2: Course Specifications

Coordinator: Dr. Ali Gammal, Head of Electrical Engineering Department

Signature:

Date: