Course Specification

Code: ECE 352 Course : Communications(2)

A- Affiliation

Relevant program:	Electronics and Communication Engineering Program(ECE)
Department offering the program:	Communications and Computer Engineering department
Department offering the course:	Communications and Computer Engineering department
Date of specifications approval:	2018-2019
Year of regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Communications(2)			**Code**:ECE 352	**Year/level:** Third year **Semester:**2nd term
Teaching Hours:	**Lecture:** 2hrs.	**Tutorial:** -2hrs	**Practical:** 2 hrs.	**Total:** 6hrs.

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

- By the end of the course the student should be able to:

- Illustrate the analog communication system.
- Knowledgeable different types of amplitude modulation, angle modulation and the suitable application for each type.
- Characterize the spectrum, the bandwidth requirement and the power requirement for each type of modulation.
- Briefly define the digital modulation and demodulation techniques.
- Understanding measurements equipment theory.

Practice in communication lab for different types of analog modulation.

2 - Intended Learning Outcomes (ILOS)

k - knowledge and understanding:

By the end of the course the student should gain the following knowledge:

k1- Discuss the Concepts and theories of mathematics appropriate to discipline in analog communication systems. (K1)

k2- Recognize the basics of design, where different elements of design and construction of analog communication systems. (K4)

k3- Follow the methodologies and techniques for solving analog modulation problems.(K5)

k4- Mention analog modulation techniques.(K8)

k5- Explain and design analog communication systems.(K16)

k6- Describe measurement techniques and measuring instrumentation that uses in analog communication systems. (K21)

I - Intellectual skills:

By the end of the course the student should be able to:

i1- Determine the appropriate mathematical methods to solve analog modulation problems.(I1)

i2- Creative thinking of design and solving analog modulation problems.(I3)

i3- Approach the suitable tools for solving problems to tackle any practical problems in analog modulation systems.(I13)

i4- Develop computer simulations and programs such as Matlab.(I15)

P - Professional and practical skills:

By the end of the course the student should be able to:

p1- Find problems solutions using engineering design, mathematical methods and previous experiences.(P1)

p2- Occur various analysis programs.(P6)

p3- Resort to analytical methods to solve analog modulation problems.(P7)

p4- Prepare and present technical reports.(P12)

p5- Use relevant laboratory and field equipment competently, safely and analyze the results correctly.(P13)

p6- Use appropriate tools to measure analog system performance.(P17)

T - General and transferable skills:

Student should be able to

By the end of the course the student should be able to:

t1- Cooperate with team members.(T1)

t2- Works under pressure.(T2)

t3- Communicate with others in a good way.(T3)

t4- Lead and encourages individuals.(T5)

3– Contents:

Topic	Lecture hours	tutorial hours	practical hours
Sampling	2	2	2
Pulse Amplitude Modulation (PAM)	2	2	2
Pulse time modulation	2	2	2
Bandwidth in pulse modulation	2	2	2
Time division multiplexing	2	2	2
Noise in amplitude modulation	2	2	2
Noise in angle modulation	2	2	2
Pre-emphasis & capture effect	2	2	2
Midterm Exam			
Noise in pulse modulation	2	2	2
Comparison of analog modulation	2	2	2
AM & FM Super heterodyne Receivers - FM stereo	2	2	2
Frequency Division Multiplexing and TV system	2	2	2
Oral/Practical exam			
Final exam			
total Hours	**24**	**24**	**24**

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Researches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√	√	√	√	√		√	√	√	√		
Intellectual Skills	√	√	√	√	√	√	√	√	√	√		√
Professional Skills	√	√		√	√	√		√	√	√	√	√
General Skills		√	√	√	√	√		√	√	√	√	√

5- Course Content /ILO's Matrix:

Course Content	k	I	p	T
Fundamentals of communication systems	k1, k4			
Transmission media and signal distortion	k1, k			
AM & DSB modulation	k1, k2, k3, k5, k6	i1, i2, i3 i	p1, p2, p3, p5, p6	t2, t4
AM & DSB demodulation	k1, k2, k3, k5, k6	i1, i2, i3, i4	p1, p2, p3, p5, p6	t2 t4
SSB modulation & demodulation	k1, k2, k3, k5, k6	i1, i2, i3, i4	p1, p2, p3, p5, p6	t2, t4
VSB modulation & demodulation	k1, k2, k3, k5	i1, i2, i3, i4	p1, p2, p3, p4	t1, t3
FM & PM modulation	k1, k2, k3, k5, k6	i1, i2, i3, i4	p1, p2, p3, p4, p5, p6	t1, t2, t3, t4
Narrow band FM & PM	k1, k2, k3, k5	i1, i2, i3, i4	p1, p2, p3	
Wideband FM & PM	k1, k2, k3, k5	i1, i2, i3, i4	p1, p2, p3, p4	t1, t3
FM generation	k1, k2, k3, k5, k6	i1, i2, i3, i4	p1, p2, p3, p4, p5, p6	t1, t2, t3, t4
FM & PM demodulation	k1, k2, k3, k5, k6	i1, i2, i3, i4	p1, p2, p3, p4, p5, p6	t1, t2, t3, t4
Digital modulations and demodulations	k1, k2, k3, k5	i1, i2, i3, i4	p1, p2, p3, p4, p5, p6	t1, t2, t3, t4

6- Students' Assessment Methods:

6.1 Tools	
Attendance to measure:	t1,t2,t3,t4
Reports and sheets to measure	k4,k5,p2,p4,i2,i3,i4,t1,t2,t3,t4
Quizzes to measure	k1,k2,k3,k5,k6,p1,p3,p5,p6,i1,i2
Oral and Practical Exam to measure	k1,k4,k5,k6,p5,p6,i2,i3,t1,t2,t3
Mid-term exam to measure	k1,k2,k3,k4,k6,p1,p3,p5,p6,i1,i2
Final exam to measure	k1,K2,k3,k4,k5,p1,p3,i1,i2

6-2, Time schedule:	
Attendance	Weekly
Reports and sheets	Bi-weekly
Quiz 1	At the 6th week of 1stsemester
Quiz 2	At the 12th week of 1stsemester.
Oral and practical Exam	At the 15th week of 1stsemester
Mid-term exam	At the 9th week of 1stsemester
Final exam	At the 15th week of 1st semester

6.3.Grading system					
Teacher Opinion	Reports and sheets	30%	45	6 Marks	15%
	Attendance			3 Marks	5 %
	Quiz 1			9 Marks	20 %
	Quiz 2			9 Marks	20 %
	Mid-term exam			18 Marks	40 %
Practical &Oral	Practical Attendance	30%	45	5 Marks	10%
	Preparing experiments			9 Marks	20%
	Experiments report			9 Marks	20%
	Oral and Practical Exam			22 Marks	50 %
Final Exam		40%	60		
Total		100%	150 Marks		

7- List of references:

7-1 Course notes

7-2 Essential books (text books)

[1] B.P.Lathi, "Modern Digital and Analog Communications Systems", Oxford University Press, 4th edition, 2009.

[2] Simon Haykin, "Communication Systems", John Wiley, 5th edition, New York, 2009.

7-3 Recommended books:

[1] A. B. Carlson, P. B. Crilly, and J. C. Rutledge, "Communication Systems", McGraw-Hill, 5th edition, 2012.

8- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Desktop computers and simulation tools
- Labs equipped by up-to-date measurement devices

Course coordinator:	Dr. Anwar M. Helaly
Head of the Department:	Prof. Dr. Salah El-Agooz
Date:	July 2018

Course Specification

Code: ECE 372 *Course :* Digital control

A- Affiliation

Relevant program:	Electronics and Communication Engineering Program(ECE)
Department offering the program:	Communications and Computer Engineering Department
Department offering the course:	Communications and Computer Engineering Department
Date of specifications approval:	2018-2019
Year of regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Digital Control			**Code:** ECE 372	**Year/level:** Third year **Semester:** 2nd term
Teaching Hours:	**Lecture:** 2hrs.	**Tutorial:** 2 hrs.	**Practical:**	**Total:** 4hrs.

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

- The student is learning about the modeling, analysis and design of continuous-time control systems.
- At the end of this course, the student should be able to understand the behavior of continuous-time control systems and to design controllers to control this behavior.

2 - Intended Learning Outcomes (ILOS)

K- Knowledge and understanding:

k1. Discuss the Concepts and theories of mathematics and sciences, appropriate to the discipline in electronics, communication and computer engineering.(K1)
k2. Follow the methodologies and techniques for solving engineering problems.(K5)
k3. Explain principles of Analyzing and design of control systems with performance evaluation.(K14)

I - Intellectual skills:

i1. Determine the appropriate mathematical methods and using computer modeling and analysis of engineering problems.(I1)
i2. Use analytical thinking in the selection of the most appropriate solutions to engineering problems.(I2)
i3. Creative thinking of design and solving engineering problem.(I3)
i4. Examine the reasons for the failure of systems and processes.(I6)
i5. Analyze engineering problems using available information.(I7)
i6. Analyze the results of mathematical modeling and evaluation of its borders.(I12)
i7. Develop computer simulations and programs.(I15)
i8. Select and apply appropriate mathematical tools, computing methods, design techniques and tools in computer engineering disciplines, for modeling and analyzing systems.(I16)
i9. Plan, conduct and write a report on a project or assignment.(I17)

P - Professional and practical skills:

Student should be able to
p1. Find problems solutions using engineering design, mathematical methods and previous experiences.(P1)
p2. Occur various analysis programs.(P6)
p3. Resort to analytical methods to solve engineering problems.(P7)
p4. Prepare and present technical reports.(P12)

T - General and transferable skills:

Student should be able to
t1. Cooperate with team members.(T1)
t2. Works under pressure.(T2)
t3. Communicate with others in a good way.(T3)
t4. Lead and encourages individuals.(T5)

3 – Contents

Topic	Lecture hours	Tutorial hours	Total hours
• Signal Processor	2	2	4
• Digital control system structure.	2	2	4
• Z-transform	2	2	4
• Inverse Z-transform	2	2	4
• Digital equivalent to analog plants	2	2	4
• Stability of digital systems	2	2	4
• Digital controllers	2	2	4
• Block diag. of sampled data sys.	2	2	4
• Midterm Exam			
• Dead beat controllers	2	2	4

• Design of digital closed loop systems	2	2	4
• Digital lead/lag compensator	2	2	4
• Polynomial methods for controller	2	2	4
• Case studies	2	2	4
• Final Exam			
Total Hours	26	26	52

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	jects and Team Working	Site Visits	searches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√	√	√	√			√			√		
kills Intellectual	√	√	√	√		√	√			√		
Professional Skills	√	√		√		√				√	√	
General Skills		√	√	√		√		√		√	√	

5-Course Content/ILOs Matrix

Course Topic	K	I	p	T
Transient response analysis	k1,k3	i1,i7	p1,p2	t1,t2
Stability Analys s and Steady State Error	k1,k3	i1,i5,i8,i9	p1,p2,p3,p4	t1,t2,t3,t4
Root locus analysis and Design	k1,k2,k3	i1,i2,i3,i4,i5,i6,i7,i8,i9	p1,p2,p3,p4	t1,t2,t3,t4
Bode Diagram analysis and Design	k1,k2,k3	i1,i2,i3,i4,i5,i6,i7,i8,i9	p1,p2,p3,p4	t1,t2,t3,t4

State Space Representation & Analysis	k1,k3	i1,i5,i8,i9	p1,p2,p3,p4	t1,t2,t3,t4
PID Controllers	k1,k2,k3	i1,i2,i3,i4,i5,i6,i7,i8,i9	p1,p2,p3,p4	t1,t2,t3,t4

6- Students' Assessment Methods:

6-1 Tools		
Attendance to measure		
Reports and sheets to measure	k2,k3,i2,i3,i4,p4,t1,t2,t3,t4	
Quizzes to measure	k1,k2,k3	
Midterm exam to measure	k1,i1,i2,i3,i4,i5,i6,i7,i8,i9,p1,p2,p3,p4	
Final exam to measure	k1, i1,i2,i3,i4,i5,p1,p3	
6-2 Time schedule:		
Attendance	Weekly	
Reports and sheets	Bi-weekly	
Quiz 1	At the 6th week	
Quiz 2	At the 12th	
Mid-term exam	At the 9th week.	
Final exam	At the 15th week	

6-3 Grading system

Teacher Opinion	**Mid-term exam**	40%	40%	40 Marks	16 Marks
	Quiz (1)	20%			8 Marks
	Quiz 2)	20%			8 Marks
	Attendance	5%			2 Marks
	Reports and sheets	15%			6 Marks
Final Exam			60 %	60 Mark	
Total			100 %	100 Mark	

7- List of references:

7.1- Course Notes (in MS Power Point and PDF format)

7.2- Essential Books (Text Books)

Modern Control engineering, K. Ogata, 5th edition or higher, 2010, Prentice Hall.

7.3- Recommended Books

[1]Automatic Control Systems, B. C. Kuo and F. Golnaraghi, 9th edition or higher, 2010, John Wiley & Sons, Inc.
[2]Modern Control Systems, R. C. Dorf, R. H. Bishop, 12th edition or higher, 2010, Prentice Hall
[3]Linear Control System Analysis and Design with Matlab, J. J. D'Azzo, C. H. Houpis and S. N. Sheldon, 5th edition or higher, 2003, Marcel Dekker, Inc.
[4]Control Systems Engineering, N. S. Nise, 6th edition or higher, 2010, John Wily

7.4- Periodicals, Web Sites, … etc (Any web site on control systems

8- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Disk-top computers and simulation tools
- Internet assessment- Mat-lab Program.

Course coordinator:	**Dr.Mohsen Saleh**
Head of the Department:	**Prof.Dr.Salah Elagouze**
Date:	July 2018

Course Specification

Code: ECE 312 *Course : Electronic circuits design*

A- Affiliation:

Relevant program:	Electronics and Communication Engineering program(ECE)
Department offering the program:	Communications and Computer Engineering Dep.
Department offering the course:	Communications and Computer Engineering Dep.
Date of specifications approval:	2018-2019
Year of regulation approval:	2013

B - BASIC INFORMATION

Course Title: Electronic circuits design			**Code:** ECE 312	**Year/level:** Third year **Semester:** 2nd term
Teaching Hours:	**Lecture:** 0hrs.	**Tutorial:0**	**Practical:** 6hrs	**Total:** 6hrs.

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

The main objective of this course is to learn the basics of digital circuit design and implementation through computer-aided design (CAD) tools.

2 - Intended Learning Outcomes (ILOS)

K- Knowledge and understanding:

By the end of the course the student should gain the following knowledge.

k1- State the basics of Field Programmable Gate Array (FPGA) Technique for circuit design and implementation (K4,K13,K20).

k2- Illustrate the way in which digital circuits are designed today, using CAD tools (K4,K20,K13).

k3-State basics of circuit design with VHDL programming language(K4,K13,K20).

I- Intellectual skills:

By the end of the course the student should be able to:

i1- Analyze, simulate, and Synthesis digital circuits using CAD Software.(I14, I18, I15)

i2- Develop VHDL Design Programs (I15).

P - Professional and practical skills:
By the end of the course the student should be able to:
p1- Prepare models and implement digital circuits for certain specific function using relevant laboratory equipment and analyze the results correctly (P13).
p2-Practice VHDL programming language for the design of digital circuits (P15).
p3- Use appropriate analysis and design tools (P17).

T - General and transferable skills:
By the end of the course the student should be able to:
t1-Works under pressure (T2).

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
▪ Introduction ▪ FPGA structure ▪ Introduction to CAD tools	-	-	6
▪ Fundamental VHDL units ▪ Data Types ▪ Operators ▪ Assignment Statements	-	-	6
▪ Multiplexers	-	-	6
▪ Decoders ▪ Encoders	-	-	6
▪ Latches ▪ Flip Flop ▪ Parallel register ▪ Shift register	-	-	6
▪ Counters	-	-	6
▪ Half Adder, Full Adder, Parallel Adder ▪ Half, Full, Parallel subtractor using Parallel Adders	-	-	6
▪ Introduction to Finite State Machines	-	-	6
▪ Mid Term	-	-	
▪ Traffic Light Controller example	-	-	6
▪ FSM as Sequence Detectors	-	-	6
▪ Timing Simulation, Synthesis, Place and Route	-	-	6
▪ Pin Assignments, FPGA configuration	-	-	6
▪ Oral/Practical	-	-	

▪ Final Exam	-	-	-
Total	-	-	72

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Researches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√	√	√	√	√		√	√	√	√		
Intellectual Skills	√	√	√	√	√	√	√	√	√	√		√
Professional Skills	√	√		√	√	√		√	√	√	√	√
General Skills		√	√	√	√	√		√	√	√	√	√

5.Course Contents/ILOS:

Course Contents	k	i	p	T
FPGA technique for digital circuit design	k1			
Basics of VHDL language	K3			
Multiplexers	K2,3	i1,2	p1,2,3	t1
Decoder/Encoder	K2,3	i1,2	p1,2,3	t1
Latch, Flip Flop, Parallel register, and Shift Register	K2,3	i1,2	p1,2,3	t1
Counters	K2,3	i1,2	p1,2,3	t1
Half Adder, Full Adder, Parallel Adder Half, Full, Parallel subtractor using Parallel Adders	K2,3	i1,2	p1,2,3	t1
Introduction to Finite State Machines	K2	i1	p1,3	t1
Traffic Light Controller example		i1	p1,3	t1
FSM as Sequence Detectors		i1	p1,3	t1
Timing Simulation, Synthesis, Place and Route	k2	i1	p1,3	
Pin Assignments, FPGA configuration	k2	i1	p1,3	

6- Students' Assessment Methods:

6-1 Tools	
Attendance & Quizzes & reports to measure	Content of k1to k3, i1 to i2, p1 to p3, and t1.
Mid-Term exam to measure	Content of k1to k3, i2, and p2.
Oral and practical exam to measure	Content of k1to k3, i1 to i2, p1 to p3, and t1.
Final exam to measure	Content of k1 to k3, i2, and p2.

6-2, Time schedule:	
Attendance	Weekly
Reports and sheets	Bi-weekly
Quiz 1	At the 6th week of 1stsemester
Quiz 2	At the 12th week of 1stsemester.
Oral and practical Exam	At the 14h week of 1stsemester
Mid-term exam	At the 9th week of 1stsemester
Final exam	At the 15th week of 1st semester

6.3.Grading system

Teacher Opinion	Reports and sheets	30%	30	4 Marks	15%
	Attendance			2 Marks	5 %
	Quiz 1			6 Marks	20 %
	Quiz 2			6 Marks	20 %
	Mid-term exam			12 Marks	40 %
Practical &Oral	Practical Attendance	30%	30	3 Marks	10%
	Preparing Experiments			9 Marks	20%
	Experiments Reports			9 Marks	20%
	Oral and Practical Exam			15 Marks	50 %
Final Exam		40%	40		
Total		100%	150 Marks		

7- List of references:

7-1 Course notes

7-2 Essential books (text books)

[1] V. A. Pedroni, "Circuit Design with VHDL," Cambridge, MA:MIT Press, 2004.
[2] S. Brown and Z. Vranesic, "Fundamentals of Digital Logic with VHDL Design," 3rd Ed., McGraw-Hill Companies, 2009.
[3] D. L. Perry, "VHDL Programming by Example," 4th Ed., McGraw-Hill, 2002.
[4] Selective Notes for a Digital Design Course using VHDL By Dr. Ihab Adly

8- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Disk-top computers and simulation tools

Course coordinator:	Dr.Fatma Elfouly	
Head of the Department:	Prof.Dr.SalahElagouze	
Date:	July 2018	

Course Specification:

Code: ECE362 ***Course :*** Electromagnetic Waves (2)

A- Affiliation:

Relevant program:	Electronics, Communications Engineering (ECE).
Department offering the program:	Communications and Computer Engineering Dep.
Department offering the course:	Communications and Computer Engineering Dep.
Date of specifications approval:	2018-2019
Date of Regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Electromagnetic Waves (1)			**Code:** ECE 362	**Year/level:** Third year **Semester:**2nd term
Teaching Hours:	**Lecture:** 2hrs	**Tutorial:**	**Practical: 2hr**	**Total:**4hrs

C - PROFESSIONAL INFORMATION:

1 – Course Learning Objectives:

The main objective of this course is to acquire the basics of The Electromagnetic (Waveguides and Microwave Devices)

2 - Intended Learning Outcomes (ILOS)

K - Knowledge and understanding:

By the end of the course the student should gain the following knowledge.

k1.Describe the Basics of propagation of electromagnetic waves in bounded media(transmission lines and wave guides.(K11)

k2.List the Microwave Devices and their applications in Microwave Systems.(K10)

I - Intellectual skills:

By the end of the course the student should be able to:

i1. Analyze a range of simple systems of waveguides (I2)

i2. Analyze problem analysis, laws derivation of microwave devices(I9)

P - Professional and practical skills:

By the end of the course the student should be able to:

p1. Use of text books and internet relevant material.(P1)

p2. Use correctly electromagnetic variables and describe each quantity by the proper unit.(P3)

p3. Use suitable component for particular application.(P8)

T- General and transferable skills:
By the end of the course the student should be able to:
t1.Refer to relevant literatures.(T9)

3 – Contents

Topic:Lecture (practical)	Lecture hours	Practical hours	Total hours
Waveguides (Microstrip Technology)	2	2	4
Parallel Plate Guides (CST Program Navigation)	2	2	4
Rectangular Waveguides (CST Program Navigation)	2	2	4
Rectangular Waveguides (CST Program Navigation)	2	2	4
Rectangular Waveguides (Special Skills on CST)	2	2	4
Rectangular Waveguides (Special Skills on CST)	2	2	4
Cylindrical Waveguides (Interface Between CST and other Packages)	2	2	4
Attenuation in waveguides (Design of Planer Transmission Lines)	2	2	4
Mid Term Exam			
Microwave Devices (Design of Planer Transmission Lines)	2	2	4
Passive Microwave Devices (Design of Planer Transmission Lines)	2	2	4
Vacuum Tubes and Mixers	2	2	4
Wave guides			
Oral and Practical Exam			
Final Exam			
Total Hours	24	24	48

Note: details of the lab activities (practical) are found in Lab Manual

4.Course Content/ILOs Matrix

Course Contents	k	i	P	t
Types of transmission lines	k1		p1	
Analysis of lines	k1,2	i1,2		
Transmission Line parameters	k1,2	i1,2	p2	
Reflection on lines	k1,2	i1,2	p2	
Smith chart	k1,2	i1,2	p3	t1

5 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Researches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√	√	√	√	√		√	√		√	√	
Intellectual Skills	√	√	√	√	√	√	√	√		√		√
Professional Skills	√	√		√	√	√		√		√	√	√
General Skills		√	√	√	√	√		√		√	√	√

6- Students' Assessment Methods:

6-1 Tools	
Quizzes to measure	Content of k1, k2, i1 , i2.
Reports and search	Content of t1.
Mid-Term exam to measure	Content of k1 , i1 , i2.
Final exam to measure	Content of k1 ,k2, i1 , i2,p1,p2, p3

6-2, Time schedule:	
Attendance	Weekly
Reports and sheets	Bi-weekly
Quiz 1	At the 6th week of 1st semester
Quiz 2	At the 12th week of 1st semester.
Oral and practical Exam	At the 14th week of 1st semester

Mid-term exam	At the 9th week of 1stsemester
Final exam	At the 15th week of 1st semester

6.3.Grading system					
Teacher Opinion	Reports and sheets	30%	30	4 Marks	15%
	Attendance: lectures			2 Marks	5 %
	Quiz 1			6 Marks	20 %
	Quiz 2			6 Marks	20 %
	Mid-term exam			12 Marks	40 %
Practical &Oral	Practical Attendance	20%	20	2 Mark	10%
	Practical Quiz 1			4 Marks	20%
	Practical Quiz 2			4 Marks	20%
	Oral and Practical Exam			10 Marks	50 %
Final Exam		50%	50		
Total		100%	100 Marks		

6- List of references:

[1] John Kraus,"Electromagnetics", McGraw Hill,4th Ed.
[2] Edward C. Jordan and Keith G Bamain ,"Electromagnetic Waves and Radiating Systems ".
[3] Microwave Devices and Circuits, Samuel Y Liao, Printice Hall, 3rd Edition.

7- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Disk-top computers and simulation tools
- Internet assessment- Mat-lab Program
- Microwave Lab equipped with instrumentations and accessories for microwave measurements.

Course coordinator:	**Dr. Mohammad Elmorsy**	
Head of the Department:	**Prof.Dr.Salah Elagouze**	
Date	**July 2018**	

Course Specification:

Code: ECE 311 ***Course :*** Electronics (5)

A- Affiliation:

Relevant program:	Electronics, Communications Engineering (ECE).
Department offering the program:	Communications and Computer Engineering Dept.
Department offering the course:	Communications and Computer Engineering Dept.
Date of specifications approval:	2018-2019
Date of Regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Electronics (5)			**Code:** ECE 311	**Year/level:** Third year **Semester:** 2nd term
Teaching Hours:	**Lecture:** 2hrs	**Tutorial:**	**Practical:** 2hr	**Total:** 4hrs

C - PROFESSIONAL INFORMATION:

1 – Course Learning Objectives:

The student learns about integrated circuits (ICs) technology, very large scale integration system (VLSI) and its design considerations, Programmable Logic Devices (PLDs), waveform generators and power electronic devices.

2 - Intended Learning Outcomes (ILOS)

K - Knowledge and understanding:

By the end of the course the student should gain the following knowledge.

k1.Describe different materials according to its characteristics(K3).
k2.State basics of design and analyzing electronic engineering systems(K13)
k3.State broad lines of industrial process engineering (K15)
k4.state methods of fabrication of integrated circuits(K18)
k5.Describe principles in the field of logic design and programming language(K20)

I - Intellectual skills:

By the end of the course the student should be able to:

i1. Use analytical thinking in the selection of the most appropriate solutions to engineering problems. (I2)
i2. Put the system to deal with the systematic development in technology.(I11)
i3.Approach the suitable tools for solving problems to tackle any practical problems in the electronics field.(I13)

P - Professional and practical skills:
By the end of the course the student should be able to:
p1. Use appropriate mathematical methods or IT tools.(P18)

T- General and transferable skills:
By the end of the course the student should be able to:
t1.Communicate effectively with others.(T3)
t2.lead and encourage individuals.(T5)

3 – Contents

Topic	Lecture hours	Practical hours	Total hours
Integrated circuits(ICs) fabrication.	2	2	4
IC Resistor ,Capacitor,Diodes,BJT,and FETs	2	2	4
IC design considerations.	2	2	4
VLSI Systems	2	2	4
Dynamic MOS shift register.	2	2	4
CMOS dynamic memory cell	2	2	4
Schmitt trigger circuit	2	2	4
RAM and memory cell	2	2	4
Mid Term Exam			
Monostable and Astable Multivibrators	2	2	4
Thyristor(SCR),Triac and application circuits	2	2	4
Triac,Diac and PUT	2	2	4
PLAs,PALs			
Oral and Practical Exam			
Final Exam			
Total Hours	24	24	48

Note: details of the lab activities (practical) are found in Lab Manual

4.Course Content/ILOs Matrix

Course Contents	K	I	P	T
Integrated circuits fabrication	k1,2,4	i1,2	p1	
RAM and memory cell	K5	i1,2	p1	t1,2
Schmitt trigger	K5	i1,2,3	p2	t1,2

Timer circuit	k1,2	i1,2	p2	
Power Electronics	k1,2	i1,2,3	p3	t1,2

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Researches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√	√	√	√	√		√	√		√	√	
Intellectual Skills	√	√	√	√	√	√	√	√		√		√
Professional Skills	√	√		√	√	√		√		√	√	√
General Skills		√	√	√	√	√		√		√	√	√

6- Students' Assessment Methods:

6-1 Tools	
Quizzes to measure	Content of k1, k2, k3, k4,k5, i1 , i2.
Reports and search	Content of t1.
Mid-Term exam to measure	Content of k1 , i1 , i2.
Final exam to measure	Content of k1 ,k2, i1 , i2,p1

6-2, Time schedule:	
Attendance	Weekly
Reports and sheets	Bi-weekly
Quiz 1	At the 6th week of 1st semester
Quiz 2	At the 12th week of 1st semester.
Oral and practical Exam	At the 14th week of 1st semester
Mid-term exam	At the 9th week of 1st semester
Final exam	At the 15th week of 1st semester

6.3.Grading system					
Teacher Opinion	Reports and sheets	30%	30	4 Marks	15%

	Attendance: lectures			2 Marks	5 %
	Quiz 1			6 Marks	20 %
	Quiz 2			6 Marks	20 %
	Mid-term exam			12 Marks	40 %
Practical &Oral	Practical Attendance	30%	30	3 Mark	10%
	Practical Quiz 1			6 Marks	20%
	Practical Quiz 2			6 Marks	20%
	Oral and Practical Exam			15 Marks	50 %
Final Exam		40%	40		
Total		100%	100 Marks		

6- List of references:

[1] j. millman and c. c. halkias integrated electronics tata mcgraw hill,2001
[2] http://www.greatbuildings.com/

7- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Disk-top computers and simulation tools.

Course coordinator:	**Dr. Nabil Abd Rabou**	
Head of the Department:	**Prof.Dr.Salah Elagouze**	
Date	**July 2018**	

Course Specification

Code: HUM 303 *Course :* Industrial Legalization and contracting

تشريعات صناعية وكتابة عقود

A- Affiliation

Relevant program:	Electronics and Communication Engineering Program(ECE)
Department offering the program:	Communications and Computer Engineering Department
Department offering the course:	Communications and Computer Engineering Department
Date of specifications approval:	2018-2019
Year of regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Industrial Legalization and Contracting			**Code:** HUM 3XX	**Year/level:** Third year **Semester:** 2nd term
Teaching Hours:	**Lecture:** 2hrs.	**Tutorial:** 1 hrs.	**Practical:**	**Total:** 3hrs.

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

The main objective of this course is to learn basics of industrial legalization and contracting and implementation through social and community productive organizations and people satisfaction.

2 - Intended Learning Outcomes (ILOS)

K- Knowledge and understanding:

k1. Follow the basics of Industrial Legalization and contracting.(K5)
k2. Explain the Industrial Legalization rights and contracting .(K15)
k3. Recognize the difference between the Industrial Legalization and the general laws beside the skills of contracting writing and documentations systems .(K21)

I - Intellectual skills:

i1.Choose the work laws locally and international workers' rights.(I9)
i2. Select right contracts specially in business and engineering works.(I10)

P - Professional and practical skills:

Student should be able to

p1. Apply road map for labor rights.(P9)

p2. Practice productivity measurements ,Improvements and applications with respect to labor satisfactory rights and social/medical insurance .(P11)

p3. Use appropriate methodologies to inform workers by their duties and rights.(P13)

p4. Practice what it motivations tools takes to run a business.(P13)

T - General and transferable skills:

Student should be able to

t1. Acquire entrepreneurial social and business community communication skills.(T8)

t2. Look for relevant methodology and procedures for right contract.(T7)

3 – Contents

Topic	Lecture hours	Tutorial hours	Total hours
Introduction	2	1	3
Labor Work regulations Laws	2	1	3
Social Insurance Systems	2	1	3
Medical Insurance Systems	2	1	3
Wages and payment Systems	2	1	3
Intellectual properties International and local laws	2	1	3
Industrial Safety regulations Laws in Work Spaces	2	1	3
Industrial Safety regulations Laws in Work Spaces	2	1	3
Mid Term	2	1	3
Definition of a Contract	2	1	3
Parts, Sections of contracts Formalities patterns	2	1	3
Types of Contracts validity and sections	2	1	3
Writing right Contracts and Documentation of	2	1	3
FIDIC Association	2	1	3
Final Exam	2	1	3
Total Hours	24	12	36

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods										
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	jects and Team Working	Site Visits	searches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√	√	√	√			√			√		
kills Intellectual	√	√	√	√		√	√			√		
Professional Skills	√	√		√		√				√		√
General Skills		√	√	√		√		√		√		√

5-Course Content/ILOs Matrix

Course Topic	K	I	P	T
Introduction	k1,k2	i2	p1,p2,p3	t1
Labor Work regulations Laws	k1,k2	i2	p1,p2,p3	t1
Social Insurance Systems	k1,k2	i 2	p1,p2,p3	t1
Medical Insurance Systems	k1,k2	i2	p1,p2,p3	t1
Wages and payment Systems	k1,k2	i2	p1,p2,p3	t1
Intellectual properties International and local laws	k1,k2	i2	p1,p2,p3	t1
Industrial Safety regulations Laws in Work Spaces	k1,k2	i2	p1,p2,p3	t1
Definition of a Contract	k1,k2	i2	p1,p2,p3	t2
Parts, Sections of contracts Formalities patterns	k3,k4			t2
Types of Contracts validity and sections	k3,k4			t2
Writing right Contracts and Documentation of	k3,k4			t2
FIDIC Association	k3,k4			t2

6- Students' Assessment Methods:

6-1 Tools		
Attendance to measure		
Reports and sheets to measure	k2,k3,i1,i2,p1,t1,t2	
Quizzes to measure	k1,k2,k3	
Midterm exam to measure	k1,i1,i2,p1,p2,p3	
Final exam to measure	k1, i1,i2,p1,p3	
6-2 Time schedule:		
Attendance	Weekly	
Reports and sheets	Bi-weekly	
Quiz 1	At the 6th week	
Quiz 2	At the 12th	
Mid-term exam	At the 9th week.	
Final exam	At the 15th week	

6-3 Grading system

Teacher Opinion	**Mid-term exam**	40%	30%	30 Marks	12 Marks
	Quiz (1)	20%			6 Marks
	Quiz 2)	20%			6 Marks
	Attendance	5%			2 Marks
	Reports and sheets	15%			4Marks
Final Exam			70 %	70 Mark	
Total			100 %	100 Mark	

7- List of references:

7.1- Course Notes (in MS Power Point and PDF format)

7.3- Recommended Books

[1] M. Mansour (2014). Industrial Legalization. Benha University Publications.
[2] Salvendry.C, (February, 2013). Handbook of Industrial Engineering, South-Western College Pub. p. 30.
[3] M. Mansour (2005). Productivity Measurements. Zagazig University Pub. Pp. 106-324.

8- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show.

Course coordinator:	**Prof.Dr.Nagy Elmahlawy**
Head of the Department:	**Prof.Dr.Salah Elagouze**
Date:	July 2018

Course Specification:

Code: EPM305 ***Course :*** Electrical Power and Machines Engineering(2)

A- Affiliation:

Relevant program:	Electronics, Communications Engineering (ECE).
Department offering the program:	Electric Power Engineering Department.
Department offering the course:	Electronics, Communications and Computer Engineering.
Date of specifications approval:	2018-2019
Date of Regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Electrical Power and Machines Engineering(2)			**Code:** EPM305	**Year/level:** Third year **Semester:**2nd term
Teaching Hours:	**Lecture:** 2hrs	**Tutorial:**	**Practical:** 2hr	**Total:**4hrs

C - PROFESSIONAL INFORMATION:

1 – Course Learning Objectives:

The main objectives of this course are

- Discuss the different types of distribution systems and its applications
- Discriminate between the different types of Distribution system, transmission line and analysis.
- Analyze of economic operation of power system.

2 - Intended Learning Outcomes (ILOS)

K - Knowledge and understanding:

By the end of the course the student should gain the following knowledge.

k1- Discuss the power loss in line conductor (K7,K11).

k2- Illustrate the voltage regulation (K1, K2, K3).

k3- Discuss the economic dispatch of power system (K12).

I - Intellectual skills:

By the end of the course the student should be able to:

i1-Determine the saving of Fuel Costs (I1).

i2- Estimate the cost of line conductor (I4).

i3- Calculate the behavior of transmission line, and construct the one line diagram (I3, I8, I9).

P - Professional and practical skills:
By the end of the course the student should be able to:
p1.Estimate voltage drop and power loss through distributer.(P1,2,5)

T- General and transferable skills:
By the end of the course the student should be able to:
t1- Collaborate effectively within multidisciplinary team (T1,T3).

3 – Contents

Topic	Lecture hours	Practical hours	Total hours
• Elements of modern AC Electrical Power System • Choice of Generation, Transmission and Distribution Voltage.	2	2	4
• Models and performance of Transmission Lines Representation.	2	2	4
• Short Transmission Line Representation.	2	2	4
• Medium Transmission Line Representation, T-Model, π-Model.	2	2	4
• Long Transmission Line Representation.	2	2	4
• Economic Operation of Power Systems.	2	2	4
• Economic Operation between Generating Units within a Power plant.	2	2	4
• Economic Operation between Power Plants in a Power System.	2	2	4
• Mid-term Exam			
• General Formula of Power Loss Equation and Loss Coefficients.	2	2	4
• DC and AC Distributors.	2	2	4
• Distributor Fed from One End and Two End.	2	2	4
• Ring Distributor • Three Phase Short Circuit Analysis, • Under Ground Cables • Protection of Electrical Power System.	2	2	4
• Oral/Practical exam			
• Final Exam			
Total Hours	24	24	48

Note: details of the lab activities (practical) are found in Lab Manual.

4.Course Content/ILOs Matrix

Course Contents	K	i	P	T

Elements of modern AC Electrical Power System Choice of Generation, Transmission and Distribution Voltage.	k1			t1
Transmission Lines Representation.	K2	i3		
Short Transmission Line Representation.	K2	i3		
Medium Transmission Line Representation, T-Model, π-Model.	K2	i3		
Long Transmission Line Representation.	K2	i3		
Economic Operation of Power Systems.	k3	i1,2		
Economic Operation between Generating Units within a Power plant.	k3	i1,2		
Economic Operation between Power Plants in a Power System.	k1	i3		
General Formula of Power Loss Equation and Loss Coefficients.	k1,2	i3		
DC and AC Distributors.	k1,2	i3	p1	
Distributor Fed from One End.	k1,2	i3	p1	
Distributer Fed from Two Ends.	k1,2	i3	p1	
Ring Distributor Three Phase Short Circuit Analysis, Under Ground Cables Protection of Electrical Power System	k1,2	i3	p1	
Elements of modern AC Electrical Power System Choice of Generation, Transmission and Distribution Voltage.	k1,2	i3		
Transmission Lines Representation.	k1,2	i3		
Short Transmission Line Representation.	k1,2	i3		

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Researches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√		√	√			√			√		
Intellectual Skills	√		√	√		√	√			√		
Professional Skills	√			√		√				√		√
General Skills			√	√		√		√		√		√

6- Students' Assessment Methods:

6-1 Tools	
Quizzes to measure	Content of k1 to k3, i1 to i3,p1 and t1
Reports and search	Content of k1 to k3, i1 to i3,p1 and t1
Mid-Term exam to measure	Content of k1 to k3, and i1 ,p1to i3
Final exam to measure	Content of k1 to k3, and i1 to i3,p1

6-2, Time schedule:	
Attendance	Weekly
Reports and sheets	Bi-weekly
Quiz 1	At the 6th week of 1st semester
Quiz 2	At the 12th week of 1st semester.
Oral and practical Exam	At the 14th week of 1st semester
Mid-term exam	At the 9th week of 1st semester
Final exam	At the 15th week of 1st semester

6.3.Grading system					
Teacher Opinion	Reports and sheets	40%	40	6 Marks	15%
	Attendance: lectures			2 Marks	5 %
	Quiz 1			8 Marks	20 %
	Quiz 2			8 Marks	20 %
	Mid-term exam			16 Marks	40 %
Final Exam		60%	60		
Total		100%	100 Marks		

6- List of references:

[1] W. Distevenson, "Electrical Power Systems," 4th edition, 2014.
[2] J.B. Gupta, "A Course in Electrical installation Estimating Costing,".
[3] A.S.Pabla, "Electric power Distribution," 6th edition, 2012.
[4] Dr.S.LUppal , "Electric power," 2004.
[5] B.L.Theraja&A.K.Theraja: Text Book of electrical Technology.
[6] R. .D.Shntz and R..A.Smith:,"Introduction to Electrical Power engineering," 1985.
[7] J. B. Gupta, "Acourse in Power Systems," 2014.
[8] B. L. Theraja, "Fundamental of Electrical Engineering & Electronics,"2012.

7- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Disk-top computers and simulation tools

Course coordinator:	**Dr. Alaa Abdelhameed**	
Head of the Department:	**Prof.Dr.Salah Elagouze**	
Date	**July 2018**	

Course Specification:

Code: ECE 385 ***Course :*** Training Project (5)

A- Affiliation:

Relevant program:	Electronics, Communications Engineering (ECE).
Department offering the program:	Electronics, Communications and Computer Engineering.
Department offering the course:	Electronics, Communications and Computer Engineering.
Date of specifications approval:	2018-2019
Date of Regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Training Project (5)			**Code:** ECE 385	**Year/level:** Third year **Semester:**Summer Course
Teaching Hours:	**Lecture:**	**Tutorial:**	**Practical:** 4hr	**Total:**4hrs

C - PROFESSIONAL INFORMATION:

1 – Course Learning Objectives:

The student learns about how to make complete communication system using Simulink.

2 - Intended Learning Outcomes (ILOS)

K - Knowledge and understanding:

By the end of the course the student should gain the following knowledge.

k1.Classify different techniques according to characteristics ,advantages, disadvantages and suitable application(K3).
k2.Mention Communication engineering techniques.(K8)
k3.Explain communication techniques performance evaluation (K14)
k4.Describe measurements instrumentation(K21)

I - Intellectual skills:

By the end of the course the student should be able to:

i1. Examine failures or faults of communication system.(I6)
i2. Analyze the communication system problems of faults.(I7)

P - Professional and practical skills:

By the end of the course the student should be able to:

p1. Find the communication system fault solution(Troubleshooting).(P1)
p2.Use of advanced measuring devices and equipments .(P5)
p3.Repair,maintain,troubleshoot using the suitable methods.(P14)

T- General and transferable skills:
By the end of the course the student should be able to:
t1.Co-operate with team members.(T1)
t2.works under pressure.(T2)
t3.communicate with other in a good way.(T3)

4.Course Contents

Topic	Practical hours
Introduction to simulink	4
Transmitter simulation using Simulink	4
Channel simulation using Simulink	4
Reciever simulation using Simulink	4
Complete system model	4

4.Course Content/ILOs Matrix

Course Contents	K	I	P	T
Simulation of communication system using Simulink/Matlab	k1,2,3,4	i1,2	p1,2,3	t1,2,3

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Researches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding		√	√		√		√	√		√	√	
Intellectual Skills		√	√		√		√	√		√		√
Professional Skills		√			√			√		√	√	√
General Skills		√	√		√			√		√	√	√

6- Students' Assessment Methods:

6-1 Tools	
Reports and search	Content of k1, k2, k3, k4, i1 , i2.
Project	Content of k1 , i1 , i2.
Oral discussion	Content of k1 ,k2, i1 , i2,p1,2,3

6-2, Time schedule:	
Attendance	Daily
Project/oral discussion	At the end of the course

6.3.Grading system					
Practical &Oral	Practical Attendance		50	5 Mark	10%
	Simulation			10 Marks	20%
	Reports			10 Marks	20%
	Project/Oral discusion			25 Marks	50 %

6- List of references:

https://www.mathworks.com/help/simulink/

7- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Disk-top computers and simulation tools
- Internet assessment- Mat-lab Program

Course coordinator:	**Dr. Hamed Elshenawy**	
Head of the Department:	**Prof.Dr.Salah Elagouze**	
Date	**July 2018**	

Course Specification:

Code: ECE 33x ***Course :*** Practical field training (3)

A- Affiliation:

Relevant program:	Electronics, Communications and Computer Engineering (ECC).
Department offering the program:	Electronics, Communications and Computer Engineering (ECC).
Department offering the course:	Electronics, Communications and Computer Engineering (ECC).
Date of specifications approval:	2018-2019
Date of Regulation Approval:	2013

B - BASIC INFORMATION

Course Title: Practical field Training (3)			**Code:** ECE 385	**Year/level:** Third year **Semester:**Summer Course
Teaching Hours:	**Lecture:**	**Tutorial:3hrs**	**Practical:**	**Total:**3hrs

C - PROFESSIONAL INFORMATION:

1 – Course Learning Objectives:

The student learns about the fields of computer network systems, Telephone switching systems, radio and TV broadcast system

2 - Intended Learning Outcomes (ILOS)

K - Knowledge and understanding:

By the end of the course the student should gain the following knowledge.

k1.Classify different techniques according to characteristics ,advantages, disadvantages and suitable application(K3).

k2.Mention Communication engineering techniques.(K8)

k3.Explain communication techniques performance evaluation (K14)

k4.Describe measurements instrumentation(K21)

I - Intellectual skills:

By the end of the course the student should be able to:

i1. Examine failures or faults of communication system.(I6)

i2. Analyze the communication system problems of faults.(I7)

P - Professional and practical skills:

By the end of the course the student should be able to:

p1. Find the communication system fault solution(Troubleshooting).(P1)

p2.Use of advanced measuring devices and equipments .(P5)

p3.Repair,maintain,troubleshoot using the suitable methods.(P14)
T- General and transferable skills: By the end of the course the student should be able to: t1.Co-operate with team members.(T1) t2.works under pressure.(T2) t3.communicate with other in a good way.(T3)

4.Course Contents

Topic	Practical hours
Computer Network systems Identify network component ,how to configure each component, identify major faults and remedies	3
Computer Network systems Deployment of network with different topology.	3
Telephone Switching systems Identify types of switches ,architecture and operation faults.	3
Telephone Switching systems Identify call process and switch Architecture of PBX and organization.	3
Radio and TV and broadcast system	3

4.Course Content/ILOs Matrix

Course Contents	K	i	P	T
- **Computer Network system** - **Telephone switching system** - **Radio &TV broadcast system**	k1,2,3,4	i1,2	p1,2,3	t1,2,3

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Teaching and Learning Methods											
	Lectures	Presentation	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Researches and Reports	Self-Study	Modeling and Simulation
Knowledge & Understanding	√	√	√		√		√	√		√	√	
Intellectual Skills		√	√		√		√	√		√		√
Professional Skills		√			√			√		√	√	√
General Skills		√	√		√			√		√	√	√

6- Students' Assessment Methods:

6-1 Tools	
Reports and search	Content of k1, k2, k3, k4, i1 , i2.
Project	Content of k1 , i1 , i2.
Oral discussion	Content of k1 ,k2, i1 , i2,p1,2,3
6-2, Time schedule:	
Attendance	Daily
Project/oral discussion	At the end of the course

6.3.Grading system					
Teacher Opinion	Reports and sheets	50%	25	Marks	15%
	Attendance			Marks	5 %
				Marks	20 %
				Marks	20 %
				Marks	40 %
Practical &Oral	Practical Attendance	50%	25	3 Marks	10%
	Report 1			5 Marks	20%
	Report 2			5 Marks	20%
	Oral and Practical Exam			12 Marks	50 %

7- List of references:

8- Facilities required for teaching and learning:

- Black or white board
- Overhead projector or Data show
- Disk-top computers and simulation tools

Course coordinator:	**Dr. Hamed Elshenawy**	
Head of the Department:	**Prof.Dr.Salah Elagouze**	
Date	**July 2018**	