Electronics and Electrical Communications Department

BSc Course Specifications

2015-2016

Preparatory Year

First Term

Course Specification

Course Title	**Engineering Physics (1) a**	
Course Code	**PME 0102**	
Academic Year	**2015/2016**	
Coordinator	**Dr. Soha Talaat Wafa**	
Teaching Staff	**Prof. Dr. Bahha Moharram – Dr. Saleh mohammed Shalaby Dr. Soha Talaat Wafa - Dr. Ayman Abdel Khader**	
Branch / Level	**Preparatory year**	
Semester	**First Semester**	
Pre-Requisite	**None**	
Course Delivery	**Lecture 4**	**14 x h lectures**
	Practical 2	**14 x h practical**
Parent Department	**Physics and Engineering Mathematics**	
Date of Approval	**28/9/2015**	

1. Course Aims

This course will enable students to acquire good awareness of:

- Help to be familiar with units and dimensions of different physical quantities and know how to use dimensions to derive equations that describe the relation between different physical quantities
- Enable to realize the fundamental laws of electricity and techniques used in the solution of simple field problems - electric fields, potentials and energies, due to simple, static charge distributions
- Discuss the different types of capacitors and its applications
- Enhance the knowledge about dielectrics, and energy stored in the electric field.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. List the fundamental and basic principles including Newton's law of gravitation, properties of matter, Displacement, Equations of velocity, and acceleration of a simple harmonic motion, elastic moduli, and Poisson's ratio, etc.

A2. Describe continuity equation, Bernoulli's equation with its applications, viscosity, and poiseuille's law, Energy of a simple harmonic oscillator

A3. Illustrate the net torque and the net force act on a dam and the force effective position, the basic principles of Coulomb's law, electric field, electric field

lines, and Gauss's law.

A4. Write the basics of the electric potential, potential energy, capacitors and dielectrics, and the pressure inside a soap bubble and water drop.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze and solve a wide variety of problems of the related subjects listed above, justify the suitability and limitations of the studied equations, and select the most appropriate equations for problem solutions.

B2. Compare between two types of energy stored in the mass-spring system and similar systems of simple harmonic motion. Also, compare between Pressure inside a soap bubble and water drop.

B3. Conclude the electric field for both point charges and distributed charge configurations.

B4. Measure the torque and potential energy of electric dipole, the capacity of capacitors of several geometries and their relevant potential energy densities and stored potential energy.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Solve problems of simple harmonic motion, Coulomb's law, and electric circuits by Kirchhoff's Laws

C2. Apply Bernoulli's equation in many fluid dynamic application (Venturi tube, Pitot tube, building in high winds), and Apply Gauss's Law in calculating electric field produced by both point charges and distributed charge configurations.

C3. diagnose energy stored in capacitors devices

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Communicate and interact effectively with other people and in a small group.

D2. Use computing and information technology, and abstract and synthesize information.

D3. Develop reasoned and scientific arguments.

D4. Manage resources and time, and work within a deadline.

3. Course Contents

Week	Topics

1	Units and dimension and applications –Electric charge, Coulomb's law, conservation of charge
2	Simple harmonic motion, definitions, uniform circular motion– Electric field, electric field lines, electric field of a point charge
3	Mass-spring system, angular simple harmonic oscillator – Principle of superposition, electric fields of a group of point charges
4	Simple and physical pendulums, energy stored– Electric fields of charge distributions
5	Damped and forced simple harmonic motions and resonance–Electric dipoles, A dipole in an electric field
6	Gravitational force, gravitational field – Electric flux, Gauss's law
7	Gravitational potential energy, Plants and satellites – A charged isolated conductor, Cylindrical symmetry, and applications of Gauss's law
8	Kepler's laws of planetary motion –Planar symmetry, Spherical symmetry and more applications
9	Fluids at rest, density and pressure –Electric potential energy, electric potential, equipotential surfaces
10	Measuring pressure devices, Archimedes's principle – Calculating the potential from the field, potential of a group of point charges
11	Motion of ideal fluids, Bernoulli's equation – Potential due to an electric dipole and a continuous charge distribution, calculating the field from the potential
12	Viscosity applications and Stoke's law –Capacitance and its calculations, parallel plate capacitors
13	Deformation of solids, Moduli of elasticity - Energy stored in an electric field, capacitance with a dielectric
14	Poisson's ratio and applications –Electric current, current density, Kirchhoff's laws

4. Teaching and Learning Methods

4.1. Lectures

4.2. Tutorials

4.3. Exercise/Solved-problem classes.

4.4. Web-sites research.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3hours	Week 16	67%
Oral Assessment	----------	----------	----------
Practical Examination	----------	----------	----------
Semester work	4hours	Through Semester	33%

6. List of references

- *Course notes:*

Some course printed (power-point) lectures.

- *Essential Books:*
  - Fundamentals of Physics, D. Halliday, R. Resnick, and J. Walker, 10th edition 2014
  - Physics of scientist and engineers, Serway, 9th edition 2014
  - Physics: Principles and Applications, Douglas C. Giancoli, 2004
  - College physics, Fredrick and J. Bueche., 1990

7. Facilities required for teaching and learning

Data-show set, PC, Power-Point software, White board, and erasable markers.

	Course Coordinator	Head of Department
Name	Dr. Soha Talaat Wafa	Prof. Dr. Mona Ahmed Darwesh
Name (Arabic)	د. سها طلعت وفا	أ.د. منى أحمد درويش
Signature		
Date	/ /2014	/ /2014

5.5 Course contents – Course ILOs Matrix

Course Code / Course Title: Engineering Physics (1a) PME 0102

Course Contents	Course outcomes ILOs														
	Knowledge and Understanding				Intellectual				Practical			Transferable			
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	D1	D2	D3	D4
Units and dimension and applications – Electric charge, Coulomb's law, conservation of charge	×		×												
Simple harmonic motion, definitions, uniform circular motion – Electric field, electric field lines, electric field of a point charge	×				×	×			×				×		
Mass-spring system, angular simple harmonic oscillator – Principle of superposition, electric fields of a group of point charges	×				×	×		×							
Simple and physical pendulums, energy stored – Electric fields of charge distributions	×		×		×	×									
Damped and forced simple harmonic motions and resonance – Electric dipoles, A dipole in an electric field								×	×		×	×		×	
Gravitational force, gravitational field – Electric flux, Gauss's law					×	×							×		
Gravitational potential energy, Plants and satellites – A charged isolated conductor, Cylindrical symmetry					×			×					×		
Kepler's laws of planetary motion – Planar symmetry, Spherical symmetry and more applications			×						×						×
Fluids at rest, density and pressure – Electric potential energy, electric potential, equipotential surfaces	×			×	×		×			×	×	×			
Measuring pressure devices, Archimedes's principle – Calculating the potential from the field, potential of a group of point charges	×				×				×				×	×	
Motion of ideal fluids, Bernoulli's equation – Potential due to an electric dipole and a continuous charge distribution, calculating the field from the potential		×		×	×			×			×	×			
Viscosity applications and Stoke's law – Capacitance and its calculations, parallel plate capacitors		×			×		×	×		×					×
Deformation of solids, Moduli of elasticity - Energy stored in an electric field, capacitance with a dielectric	×			×	×			×					×		×
Poisson's ratio and applications – Electric current, current density, Kirchhoff's laws				×	×					×				×	

Course coordinator: **Dr. Soha Talaat Wafa** Head of Department: **Prof. Dr. Mona Ahmed Darweesh**

Course Specification

Course Title	Engineering Mechanics	
Course Code	PME 0003	
Academic Year	2015-2016	
Coordinator	Dr. Mohamed Ali Bec,	
Teaching Staff	Dr. Mohamed Ali Bec,	
Branch / Level	The Preparatory Year	
Semester	First Term	
Pre-Requisite		
Course Delivery	Lecture	14 x 2 h lectures
	Practical	14 x 2 h practical
Parent Department	Engineering Physics and Mathematics	
Date of Approval	28/9/2015	

1. Course Aims

The aims of this course are to:

- Acquire the basics of engineering phenomena.
- Discuss vectors and its applications, planar forces, equilibrium and trusses.
- Discuss the different types of supports, equilibrium under the effect of coplanar forces.
- Help using different methods equilibrium of a rigid body under different effects.
- Assist dealing with the required analysis to obtain Center of masses.
- Discuss Moment of inertia.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1- List the basics of space vectors in mechanic systems.
A2- Describe the equivalent couples and equivalent groups.
A3- Write the equations of equilibrium for the rigid body.
A4- List the types of supports
A5- Explain the method of finding the center of masses.
A6-Mention how to calculate the moment of inertia.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1- Compare between deferent methods of vectors representation.
B2- Interpret how equilibrium and rigidity of plain trusses can be determined.
B3- Demonstrate the methods of calculating the center of mass for any body.
B4- Conclude whether any space forces system equivalent to a wrench or not.
B5- Solve problems and exercises of center of masses and moment of inertia.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1-Apply mechanics theorems to solve some physical problems.
C2- Analyze any system to get equivalent forces and couples.
C3- Solve some applications of different equilibrium systems.
C4- Apply different methods solving plain truss.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in team- work groups.
D2. Face unexpected problems and exercises.
D3. Develop personal skills to communicate with others.
D4. Use general basics for self and continuous learning.
D5. Manage the process of handling different duties and tasks within the required time efficiently and the least possible resources.

3. Course Contents

Week	Topics
1,2	Applications on space vectors, resultant of a group of forces.
3,4	Moments.
5	Equivalent couples, equivalent wrench, equation of equilibrium for the rigid body.
6	Types of supports, equilibrium under the effect of coplanar forces.
7,8	Equilibrium of groups of space forces.
9,10,11	Equilibrium of a rigid body under the effect of a group of forces and space couples.
12	Center of masses(a group of particles-areas)
13,14	Moment of inertia (parallel- principle axes – areas)

4. Teaching and Learning Methods

1- Lectures.
2- Tutorials.
3- Exercise\ solved – problem classes.
4- Problem sheet assignments.

5- Research skills development.
6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	----------		
Oral Assessment	----------	----------	0.0 %
Practical Examination	----------	----------	0.0 %
Semester work	5 hours	Through semester	30%

6. List of references

- Course notes:

Staff members- Faculty of Engineering- Tanta University, "Engineering Mechanics, First Term ".

- Essential Books:

1. Beer, F.P., and Johnson, E.R., "Vector Mechanics for Engineers, Dynamics",4th Ed., McGraw Hill, 1984.
2. Hibberler, R. C., "Engineering Mechanics " 3rd edition.
3. Hibbeler R. C. Engineering Mechanics – Statics 12 th edition , 2009.
4. Reddy J. N. Applied Mechanics Reviews, Texas A&M university July 2009.
5. Schaum's Outline Series "Engineering Mechanics " (Statics and Dynamics).

7. Facilities required for teaching and learning

Data show set, power point software, white board and erasable markers.

	Course Coordinator	Head of Department
Name	Dr. Mohamed Ali Bec,	Prof. Dr. Mona Darwish
Name (Arabic)	د. محمد على بك عبدالرحمن	أ. د. منى احمد درويش
Signature		
Date	28/ 9 /2015	28/ 9 /2015

8- Course contents – Course ILOs Matrix

Course Code / Course Title: PME 0003/ Engineering Mechanics

Course Contents	Course outcomes ILOs																		
	Knowledge and Understanding						Intellectual					Practical				Transferable			
	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	D1	D2	D3	D4
Applications on space vectors, resultant of a group of forces.	X						X					X					X		
Moments.		X							X				X			X			
Equivalent couples, equivalent wrench, equation of equilibrium for the rigid body.		X						X		X			X				X		
Types of supports, equilibrium under the effect of coplanar forces.				X											X			X	
Equilibrium of groups of space forces.			X					X				X		X					X
Equilibrium of a rigid body under the effect of a group of forces and space couples.			X					X						X		X			X
Center of masses(a group of particles-areas)		X			X	X			X		X			X			X		
Moment of inertia (parallel- principle axes – areas)				X		X		X		X	X		X		X		X	X	

Course coordinator: Dr. Mohamed Ali Bec, **Head of Department:** Prof. Dr. Mona Darwesh

Course Specification

Course Title	**Engineering drawing and projection**	
Course Code	**MPD 0001**	
Academic Year	**2015-2016**	
Coordinator	**Prof. Dr. Ezzat showaib**	
Teaching Staff	**Prof. Dr. Ezzat showaib, Dr.Hanafy Hendawy, Dr. Alaa eldin Alhamady**	
Branch / Level	**------ / 0**	
Semester	**First and second (continuous course)**	
Pre-Requisite	**-**	
Course Delivery	**Lecture**	**28 x 2 h lectures**
	Practical	**28 x 3 h practical**
Parent Department	**Production Engineering and Mechanical Design Department**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Enhance the knowledge and understanding the fundamental of engineering drawing.
- Enlarge students, imagination capability in understanding the mechanical drawings and steel structure drawing.
- Help to relate between isometric and projection
- Acquire the necessary skills related to geometrical scaling in engineering drawing
- Improve imagination skill

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

a1- Mention the fundamentals of engineering drawing
a2- Explain the basics of the projection

B. Intellectual skills:

By the end of this course, the students should be able to:

b1- Compare between the three projections
b2- Create 3-D geometry from projections
b3- Interpret engineering ideas into drawings.

C. Professional and practical skills:

By the end of this course, the students should be able to:

c1- Apply CAD in engineering drawing
c2- Perform an isometric for engineering objects
c3- Verify objects in different projections and from different views

D. General and transferable skills:

By the end of this course, the students should be able to:

d1- Communicate with other students and teaching staff.
d2- Manage time.

3. Course Contents

Week	Topics
1 (1st term)	Definitions
2	Engineering tools and how to use them
3,4	Line types and dimensions
5,6	Definition of descriptive geometry
7,8	Point representation
9,10	Straight line representation
11,12	Plane representation and position problem
13,14	Measurement problem and auxiliary projection
17-20 (2nd term)	Engineering isometric drawing
21-25	Engineering Sectioning
26,27	Metallic construction
28-30	Introduction to using computer in engineering drawing

4. Teaching and Learning Methods

4.1- lectures
4.2- Tutorial.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	4 h	32	60%
Oral Assessment	-	-	-
Practical Examination	-	-	-
Semester work	3.5 h 2 h	Weekly 9th week	40%

6. List of references

Course notes:

Engineering Drawing, prepared by teaching staff

Essential Books: (Text Books)

- Thomas, E.F. and Vierck, C.J., "Engineering Drawing and Graphic Technology", McGraw-Hill, 2001
- Hart, K.R., "Engineering Drawing", The English Universities Press Ltd, 2003.
- S. E. Warren "Elements of Machine Construction and Drawing", Vol.1, 2010

Web sites:

- To be cited during the course

7. Facilities required for teaching and learning

- P.C, data show, portable display screen, necessary boards and drawing tables.

	Course Coordinator	Head of Department
Name Name (Arabic)	Prof. Dr. Ezzat showaib ا.د/عزت شعيب	Prof. Dr. Ezzat showaib ا.د/عزت شعيب
Signature		
Date	28 /09 /2015	28 /09 /2015

Course contents – Course ILOs Matrix

Course Code / Course Title: Engineering drawing / MPD 0001

Course Contents	Course outcomes ILOs									
	Knowledge and Understanding		Intellectual Skills			Professional and Practical Skills			General and Transferable Skills	
	a1	a2	b1	b2	b3	c1	c2	c3	d1	d2
Definitions	x	x			x				x	
Engineering tools and how to use them	x			x			x		x	
Line types and dimensions	x	x			x		x		x	x
Definition of descriptive geometry	x		x			x		x		
Point representation		x			x			x	x	
Straight line representation	x		x	x				x		x
Plane representation and position problem	x				x		x		x	x
Measurement problem and auxiliary projection		x	x	x		x				x
Engineering isometric drawing		x			x		x		x	x
Engineering Sectioning	x		x					x	x	
Metallic construction		x			x				x	x
Introduction to using comp-uter in engineering drawing	x		x	x		x	x	x		x

Course coordinator: **Head of Department:**

Prof. Dr. Ezzat showaib **Prof. Dr. Ezzat showaib**

Course Specification

Course Title	**Engineering Chemistry**	
Course Code	**PME 0104**	
Academic Year	**2015/ 2016**	
Coordinator	**Prof. dr. Mona Darwish**	
Teaching Staff	**Prof. Mona Darwish&Dr.OlfatAbdAllah Mohamed**	
Branch / Level	**- / The Preparatory Year**	
Semester	**First Term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 3h lectures**
	Practical	**14 x 2h practical**
Parent Department	**Department of Physics and Engineering Mathematics**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Enhance the scientific fundamentals of electrochemistry
- Acquire knowledge and practical skills in drawing mass and heat balance calculations of the most abundant chemical technological processes.
- Discuss air, water and soil pollution.
- Discuss the instruments and equipment involved in pollution assessment, control and abatement.
- Discuss the basic principles of writing chemical equations, units and chemical calculations, concepts of the matter and its states (solid, liquid and gaseous)
- Acquire a background on water treatment.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Describe the Scientific fundamentals and typical features of the chemical technological processes and the interrelationships between these processes.

A2. Illustrate the development of physical chemistry, inorganic chemistry, organic chemistry, chemical thermodynamics and chemical kinetics.

A3. List the characteristics of heat balances in chemical technological processes and schemes and flow diagrams of some of these processes.

A4. Explain the concepts of Technology of water treatment for industrial and municipal use

A5. Mention the better ways and means of industrial waste disposal and waste control
A6. Define the main differences between different types of Pollutions (air, water and soil) and principles of pollution assessment, control, and abatement.

B. Intellectual Skills

By the end of this course students should be able to:

B1. Compare between various factors describing different types of Water treatment.
B2. Apply the methods used to define the operating Electrochemistry.
B3. Interpret the situations where the corrosion losses have to be considered and where they have to be neglected.
B4. Evaluate the Fertiliers model.
B5. Suggest the suitable type of Cements and building materials depending on their features, technical and economical conditions.

C. Professional and Practical Skills

By the end of this course students should be able to:

C1. Diagnose the important Cements and building materials features.
C2. Dissect the corrision factors.
C3. Collect different chemical technological processes.
C4. Dissect the chemical thermodynamics problem.
C5. Store the major types of pollution.

D. General and Transferable Skills

By the end of this course students should be able to:

D1. Manage data about a certain topics
D2. Work effectively within a team to process a collected data.
D3. Manage selected tasks within specific time

3. Contents

week	Topics
1-2	Gaseous state
3-4	Solutions
5	Chemical thermodynamics
6	Fuels and combustion
7-8	Electrochemistry

9	Cements and building materials
10	Water treatment
11	Pollution (air, water, soil)
12	Pollution control and abatement
13-14	Fertiliers

4. Teaching and Learning Methods

4.1-Lecturs
4.2-Problems solving
4.3-Web-sites show and demonstration
4.4-General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	60%
Oral Assessment	15 min	15	10%
Practical Examination	1 hrs	15	10%
Semester work	3 hrs (overall)	Weeks: 4, 8, 12	20%

6. List of references

Course Notes

- Staff Member of Engineering chemistry Book 2014
- Prof. Mona Darwish "Engineering Chemistry " 2013
- *Bastawissi, A. E., "Engineering Chemistry," El-Turky Press, Tanta,* Egypt, 2006.

Essential Books

- Zumall , (Principle chemistry)2012
-
- *Rashed, I. G., "Engineering Chemistry," El-Mansoura Press, El-Mansoura, Egypt, 2006.*
- *Zayed, M. A. and El-Sherbeeny, M. "Engineering Chemistry," Shebin-Elkom Press, Shebin-Elkom, Egypt, 2006*
- *Jain, P. C., " Engineering Chemistry," DhanpatRai of Sons, Delhi, 1982.*
- *Shereve, R. N. and Brink, J. A., "Chemical Process Industries, 6th ed., McGraw-Hill Inc., 1985.*
- *Chigier, N., "Energy, Combustion and Environment," McGraw-Hill Inc., 1981.*

Web Sites, …etc

- *To be cited during the course*

7. Facilities required for teaching and learning

- PC, data show, portable display screen
- Overhead Projector White board and erasable markers.
- Chemistry laboratory

	Course Coordinator	Head of Department
Name	Prof. Mona Darwish, Dr.OlfatAbdAllah	Prof. Dr.Mona Darwish
Name (Arabic)	أ. د. منى درويش ، د. ألفت عبدالله	أ. د. منى درويش
Signature		
Date	/ / 2014	/ / 2014

Course contents – Course ILOs Matrix

Course Code / Course Title: PME 0104/Engineering Chemistry

Course Contents	Course outcomes ILOs																		
	Knowledge and Understanding						Intellectual					Practical					Transferable		
	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	d3
Gaseous state	X	X																	
Solutions			X				X					X	X						
Chemical thermodynamics						X					X		X			X			X
Fuels and combustion										X					X		X	X	
Electrochemistry				X				X						X					
Cements and building materials								X						X					
Water treatment					X				X	X					X		X	X	
Pollution (air, water, soil)						X					X					X			X
Pollution control and abatement		X				X					X					X			X
Fertiliers						X					X					X	X		

Course Coordinator Prof.Dr. Mona Darwish **Head of Department:** Prof. Dr.Mona Darwish

Course Specification

Course Title	**Computer Technology**	
Course Code	**CCE 0101**	
Academic Year	**2014-2015**	
Coordinator	**Prof. Dr Elsayed Sallam**	
Teaching Staff	**Prof. Dr Elsayed Sallam – Dr. Ahmed Ramadan - Dr. Mahmoud AlShewimy**	
Level	**Preparatory Year**	
Semester	**First term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 2 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Computer and control engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Enhance the information about computer field
- Acquire knowledge about the history of building the computer
- Help the student to deal with the computer with deeper understanding to its hardware, software and operating system

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Enumerate the basic parts of computer.
A2. State the history of building the computer
A3. List the famous operating systems and programming languages.
A4. Identify some software packages.
A5. Mention computer network concepts and ideas.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Choose the basic parts of computer based on their function.
B2. Integrate between famous operating systems
B3. Differentiate between the high level and low level programming languages.
B4. Choose the proper software packages for a certain task.
B5. Compare between the various computer network topologies.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply basic information to recognize computer functions.
C2. Apply different features to identify computer components.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Obtain information retrieval skills through books and the WWW and to be able to use general IT facilities.
D2. Work competently among team workers of different task assignments.
D3. Share ideas and communicate with others.

3. Course Contents

Week	Topics
1-2	The computer age :an overview
3-5	Hardware components
6-7	Operating systems
8-10	Low-level and high-level languages
11-13	Popular software packages
14	Introduction to computer networks

4. Teaching and Learning Methods

4.1- Lectures

4.2- Problems solving

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	70 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	3 hrs (overall)	Weeks: 3,5,8,9,11	30 %

6. List of references

Course notes:

- *Prepared by the lecturer and handed to the students at the lectures.*

Essential Books:

- *Mano M A, and Ciletti, M D, "Digital Design," 4th Ed., Prentice Hall. 2007.*

Web sites:

- www.wikipedia.com
- www.ieeexplore.ieee.org
- www.ece.eng.ua.edu

7. Facilities required for teaching and learning

- *Microprocessor lab.*
- *Data-show system.*

	Course Coordinator	Head of Department
Name	Prof. Dr. El Sayed Sallam	Assoc. Prof. Dr. Amany Sarhan
Name (Arabic)	أ. د. السيد سلام	أ. د.م. أماني سرحان
Signature		
Date	11/ 10 /2014	11/ 10 /2014

Course contents – Course ILOs Matrix

Course Code / Course Title: CCE 0101/ Computer Technology

Course Contents	Course outcomes (ILOs)														
	Knowledge and Understanding					Intellectual Skills					Professional skills		General and Transferable Skills		
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	D1	D2	D3
The computer age :an overview		x									x		x		
Hardware components	x					x					x		x		
Operating systems			x				x					x		x	
Low-level and high-level languages			x					x						x	
Popular software packages				x					x			x			x
Introduction to computer networks					x					x	x				x

Course coordinator: Prof. Dr. El Sayed Sallam **Head of Department:** Assoc. Prof. Dr. Amany Sarhan

Preparatory Year

Second Term

Course Specification

Course Title	**Engineering Physics (1) b**	
Course Code	**PME 0201**	
Academic Year	**Preparatory year 2015/2016**	
Coordinator	**Dr. Adel Maher Wahba**	
Teaching Staff	**Prof. Bahaa Eddin Moharram – Dr. Adel Maher – Dr. Hatem Fouad – Dr. Osama Hatem**	
Branch / Level	**General/Second term**	
Semester	**Second Semester**	
Pre-Requisite	**None**	
Course Delivery	**Lecture 4**	**14 × 4 h lectures**
	Practical 1	**14 × 1 h practical**
	Tutorial 2	**14 × 2 h practical**
Parent Department	**Engineering Physics and Mathematics**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Be familiar with the concepts of thermometers, thermal expansion, thermodynamics laws.
- Realize the mechanisms of heat transfer, kinetic theory of gases, ideal gases, translational kinetic energy.
- Recognize the difference between reversible and irreversible processes, and understand entropy changes, second law of thermodynamics, Carnot cycle and relevant applications (basic of heat engines, basics of refrigerators).
- Learn about the effects of magnetic fields on moving charges and current carrying conductors.
- Know sources of magnetic field and method of evaluating them.
- Be aware of magnetic induction and its sources.
- Recognize the difference between diamagnetism, paramagnetism, and ferromagnetism.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Identify the fundamental and basic principles including first law of thermodynamic, thermal expansion, heat, degrees of freedom and its relation with the specific heat.

A4. Describe methods of heat transfer, kinetic theory of gases.

A5. Recall the effects of magnetic forces on electric charges and current carrying conductors.

A6. Outline the basics of the mutual inductance, magnetic energy, magnetic properties of materials.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze and solve a wide variety of problems of the related subjects listed above, justify the suitability and limitations of the studied equations, and select the most appropriate equations for problem solutions.

B2. Differentiate and compare the different types of heat transfer in different media.

B3. Deduce the magnetic force for both moving charges and distributed charge configurations.

B4. Predict the mutual and self-inductance and the induced electromotive force.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Demonstrate knowledge and understanding of essential facts, concepts, principles and theories in solving of qualitative and quantitative problems of both familiar and unfamiliar nature.

C2. Validate the concepts of some of the studied physical phenomena (for both Physcis1a and Physics 1b courses) practically in the lab, including SHM, viscosity, electricity, Kirchhoff's laws, Newton's law of cooling, etc

C3. Work safely in a laboratory within a team work.

C4. Assemble the setup of the scientific experiments independently under stuff supervision.

C5. Employ a variety of technical and laboratory-based methods for the collection and analysis of the experimental data.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Communicate and interact effectively with other people and in a small group.

D2. Use computing and information technology, and abstract and synthesize information.

D3. Develop reasoned and scientific arguments.

D4. Manage resources and time, and work within a deadline.

3. Course Contents

Topic No.	Topic	Total hours	Lecture	Tutorial	Practical
1	Kinetic theory of gas, applications, examples and problems; First law of thermodynamics, cyclic processes, definitions, examples, discussion and application; Second law of thermodynamics, definitions, entropy; Carnot's heat engine, efficiency and performance of an engine, applications.	20	12	6	2
2	Magnetic field (effects on moving charge, current-carrying wires and loops) and applications; Sources of magnetic field (Biot-Savart law, long straight wire, Ampere's law, applications.	22	12	6	4
Mid-term exam					
3	Temperature, units and thermometers; Heat capacity and specific heat; Latent heats; Mechanisms of heat transfer: conduction, convection, and radiation.	20	12	6	2
4	Electromagnetic induction (flux, Faraday's law, Lenz's law, induced electric field); Inductance (self and mutual inductance, LR circuits, LC oscillations); Alternating current circuits (R, L, C in AC circuits, RLC series circuit and resonance)	22	12	6	4
Oral and Laboratory exam					

4. Teaching and Learning Methods

4.5. Lectures

4.6. Tutorials

4.7. Exercise/Solved-problem classes.

4.8. Problem sheet assignments.

4.9. Web-sites research.

4.10. Directed reading and independent studies.

5. Student Assessment

5.1	Quizzes	to assess	*Knowledge, understanding, and intellectual skills*
5.2	Reports	to assess	*Professional skills, and searching capability*
5.3	Problem-solving reports	to assess	*Knowledge, understanding, and intellectual skills*
5.4	Mid-term exam and pre-final Exam	to assess	*Knowledge, understanding, intellectual, and professional skills*
5.5	Oral and laboratory exam	to assess	*Intellectual, professional, practical and general skills*
5.6	Final Exam	to assess	*Knowledge, understanding, intellectual, and professional skills*

Assessment Schedule

Assessment 1	on week	4, 6, 12
Assessment 2	on week	5, 11
Assessment 3	on week	At the end of each topic
Assessment 4	on week	8, 14
Assessment 5	on week	15
Assessment 6	On week	16

Mid-Term Examination	14.29 %
Final-term Examination	57.14 %
Oral Examination.	8.57 %
Practical Examination	5.71 %
Semester Work	14.29 %
Other types of assessment	0 %
Total	100 %

6. List of references

6.1- Course printed (power-point) lectures & student notebook & Lab notebook

6.2- Essential Books (Text Books)

- Fundamental of Physics, 8th Ed., Halliday, 2008
- Physics of Scientists and Engineers; Serway, 1990.
- Physics: Principles and Applications, Douglas C. Giancoli, 2004
- College physics, Fredrick and J. Bueche., 1990

7- Facilities Required for Teaching and Learning

Data-show set, PC, Power-Point software, White board, and erasable markers.

	Course Coordinator	Head of Department
Name	Dr. Adel Maher Wahba	Prof. Dr. Mona Ahmed Darweesh
Name (Arabic)	د. عادل ماهر وهبه	أ. د. منى أحمد درويش
Signature		
Date	12 January2015	

Course Specification

Course Title	**Engineering Mechanics**	
Course Code	**PME 0003**	
Academic Year	**2014-2015**	
Coordinator	**Dr. Ashraf Al Mahallawy**	
Teaching Staff	**Dr. Ashraf Al Mahallawy**	
Branch / Level	**The Preparatory Year**	
Semester	**Second Term**	
Pre-Requisite		
Course Delivery	**Lecture**	**14 x 2 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Engineering Physics and Mathematics**	
Date of Approval		

1. Course Aims

The aims of this course are to:

- Acquire the basics laws to describe phenomena that comprise the world view of the engineer.
- Discuss the motion of a particle in different coordinates, relative motion between particles.
- Discuss the different laws of motion, Principle of work and kinetic energy, conservative forces and principle of conservation of mechanical energy.
- Enhance the basic principle of simple harmonic motion.

- Assist dealing with the mathematical tools for problem solving, scientific report writing, and the collection and analysis of information

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1- Define the meaning of displacement, velocity and acceleration of a particle.
A2- Trace the trajectory of planner motion and list the types of different coordinates.
A3- Describe the basic of relative motion between particles.
A4- Say the Newton's laws of motion.
A5- List the types of motion in resistive medium .
A6- Mention the equation of motion of variable mass and its applications.
A7- Illustrate the idea of simple harmonic motion and recall some of its applications.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1- Formulate the equations of motion of particle.
B2- Compare between the motion of a particle in different coordinates.
B3- Measure the relative motion between two particles.
B4- Compare between different Newton's laws of motion of a particle.
B5- Conclude the equation describing the simple harmonic motion.
B6-Formulate equations of motion using principle of work and energy and Principe of momentum.
B7-Interpret the conditions for a force to be conservation.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1-Apply mechanics theorems to solve some physical problems.
C2- Apply several methods to solve many dynamic problems in different coordinates.
C3- Predict the behavior of any dynamical system when the initial conditions are given.
C4- algorithms for simple dynamic problems.

D. General and transferable skills:

By the end of this course, the students should be able to:

D5. Work in team- work groups.

D6. Face unexpected problems and exercises.

D7. Develop personal skills to communicate with others.

D8. Use general basics for self and continuous learning.

D9. Manage the process of handling different duties and tasks within the required time efficiently and the least possible resources.

3. Course Contents

Week	Topics
1,2	Position displacement, velocity, and acceleration of a particle
3,4	Trajectory of planer Motion of a particle
5	Description of the planer - Motion in Cartesian coordinates.
6	Trajectory of planer Motion of a particle
7,8	Projectiles (their velocity, acceleration, rang, and trajectory equation)
9	Restricted Motion of a particle along a straight line Description of motion in natural coordinates and polar coordinates
10	Relative motion between particles
11	Simple Harmonic Motion of a particle, Restricted Motion of a particle along a circular path
12	Newton's laws of motion, Motion in resistive medium
13	Variable mass and its applications
14	Principle of work and kinetic energy, Conservative forces, principle of conservation of mechanical energy

4. Teaching and Learning Methods

1- Lectures.
2- Tutorials.
3- Exercise\ solved – problem classes.
4- Problem sheet assignments.
5- Research skills development.
6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3Hr	Week 16	70%
Oral Assessment	----------	----------	0.0 %
Practical Examination	----------	----------	0.0 %
Semester work	5 hours	Through semester	30%

6. List of references

- Course notes:

Staff members- Faculty of Engineering- Tanta University, "Engineering Mechanics, Second Term ".

- Essential Books:

6. Beer, F.P., and Johnson, E.R., "Vector Mechanics for Engineers, Dynamics",4th Ed., McGraw Hill, 1984.
7. Hibberler, R. C., "Engineering Mechanics " 3rd edition.
8. Hibbeler R. C. Engineering Mechanics – Statics 12 th edition , 2009.
9. Reddy J. N. Applied Mechanics Reviews, Texas A&M university July 2009.
10. Schaum's Outline Series "Engineering Mechanics " (Statics and Dynamics).

7. Facilities required for teaching and learning

Data show set, power point software, white board and erasable markers.

	Course Coordinator	Head of Department
Name	Dr. Ashraf Al |Mahallawy	Prof. Dr. Mona A. Darwish
Name (Arabic)	د. اشرف محمد المحلاوى	أ. د. منى احمد درويش
Signature		
Date	١/ ١ /٢٠١٥	١ / ١ /٢٠١٥

Course Specification

Course Title	Production Engineering	
Course Code	MPD 0202	
Academic Year	2015-2016	
Coordinator	Prof.Dr. Abd El Fattah khourshid	
Teaching Staff	Prof.Dr. Abd El Fattah khourshid - Dr. Alaa eldin Alhamady	
Branch / Level	Production / 0	
Semester	Second	
Pre-Requisite	-	
Course Delivery	Lecture	14 x 2 h lectures
	Practical	14 x 2 h practical
Parent Department	Production Engineering and Mechanical Design Department	
Date of Approval	13/2/2016	

1. Course Aims

The aims of this course are to:

- Enhance the knowledge about the engineering materials and their properties
- Evaluate the applicability of particular materials for specific design requirements
- Select appropriate manufacturing process to produce various products
- Assist the information related to the product design and manufacturing techniques relation

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

a1- Illustrate the different properties of materials.
a2- Mention the main manufacturing processes
a3- Define the basis of production engineering

B. Intellectual skills:

By the end of this course, the students should be able to:

b1- compare between the material and method of their selection
b2- Suggest a suitable manufacturing process for certain application.
b3- Evaluate the machining time for certain product.

C. Professional and practical skills:

By the end of this course, the students should be able to:

c1- Apply the choice of suitable materials and processes
c2- Perserve and accurate using of simple measuring tools
c3- Verify the product cost factors

D. General and transferable skills:

By the end of this course, the students should be able to:

d1- Adopt tasks in a team work
d2- Present engineering ethics when dealing with technicians.
d3- Present the application of safety precautions in hazardous workplaces and workshops.

3. Course Contents

Week	Topics
1,2	Materials engineering
3-5	Forming processes(casting – forging – rolling – extrusion – drawing – spinning)
6-9	Joining processes (riveting – welding – adhesive)
10-13	Cutting processes (Manual – turning – milling – drilling – shaping - grinding)
14	Measuring instruments

4. Teaching and Learning Methods

4.1- Lectures
4.2-Discussion
4.3-Class and workshop activities

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 h	16	60%
Oral Assessment	15 min	Week15	10%
Practical Examination	15 min	Week15	10%
Semester work	5 h	3,6,9	20%

6. List of references

Course notes:

Lecture notes prepared by the department staff.

Essential Books: (Text Books)

- Crease, Introduction to Manufacturing Materials and Processes, Marcel Decker, NY, 1999.
- Ostwald et al., Manufacturing Processes and Systems, NY, 1997.

- M.P. Groover, Fundamentals of Modern Manufacturing, Wily, 2007.

Web sites:

- To be cited during the course
- http//www.ee.cermer.wvu.edu

7. Facilities required for teaching and learning

- P.C, data show, portable display screen.
- Workshop lab equipped with different manufacturing processes and measuring tools.

	Course Coordinator	Head of Department
Name Name (Arabic)	Prof.Dr. Abd El Fattah khourshid أ. د/ عبد الفتاح خورشيد	Prof. Dr. Ezzat showaib ا.د/عزت شعيب
Signature		
Date	1/ 9 /2014	1/ 9 /2014

Course contents – Course ILOs Matrix

Course Code / Course Title: Production Engineering / MPD0202

Course Contents	Course outcomes ILOs											
	Knowledge and Understanding			Intellectual Skills			Professional and Practical Skills			General and Transferable Skills		
	a1	a2	a3	b1	b2	b3	c1	c2	c3	d1	d2	d3
Materials engineering	x	x		x			x			x		
Forming processes: (casting – forging – rolling – extrusion – drawing – spinning)	x		x		x	x			x		x	x
Joining processes: (riveting – welding – adhesive)		x	x		x		x		x		x	x
Cutting processes: (Manual – turning – milling – drilling - shaping - grinding)	x			x	x			x	x		x	x
Measuring instruments		x	x			x		x		x	x	

Course coordinator: **Head of Department:**

Prof.Dr. Abd El Fattah khourshid **Prof. Dr. Ezzat showaib**

Course Specification

Course Title	**Technical English**	
Course Code	***02H1	
Academic Year	2015-2016	
Coordinator	Prof. Dr Mahmoud Fahmy	
Teaching Staff	Prof. Dr. MAhmoud Fahmy, Assoc.Prof.Dr. Amany sarhan, dr. Ahmed Rammdan, Dr. Hamed Hemeda	
Level	Preparatory Year	
Semester	Second term	
Pre-Requisite	NA	
Course Delivery	Lecture	14 x 2 h lectures
	Practical	14 x - h practical
Parent Department	Computer and control engineering	
Date of Approval	13/2/2016	

1. Course Aims

The aims of this course are to:

- Enhance the knowledge about the technical terms used in engineering.
- Assist the basics of writing reports in English.
- Enable translation from English to Arabic and vice versa.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Enumerate the basic grammar rules of English.
A2. List many technical language terms.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Differentiate between the basic grammars rules of English.
B2. Differentiate between many technical language terms.
B3. Analyze a sentence to be able to translate it into the other language.
B4. Analyze a sentence to understand its content.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C3. Translate a passage from Arabic to English and vice versa.

C4. Translate words from Arabic to English and vice versa.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Obtain information retrieval skills through books and the WWW and to be able to use general IT facilities.
D2. Work competently among team workers of different task assignments.

3. Course Contents

Week	Topics
1-4	Technical reading passages and comprehension questions
5-8	Grammatical rules and structural patterns used in technical writing
9-11	Technical term study
12-14	Technical articles for translation from English to Arabic and vice versa

4. Teaching and Learning Methods

4.1- Lectures

4.2- Sheets solving

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	80 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	2 hrs (overall)	Weeks: 3,6,8,10	20 %

6. List of references

Course notes:

- *Prepared by the lecturer and handed to the students at the lectures.*

Essential Books:

Web sites:

- www.wikipedia.com
- www.ieeexplore.ieee.org
- www.ece.eng.ua.edu

7. Facilities required for teaching and learning

- *Language lab*
- *Toefl books and Cds*

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	Course Coordinator	Head of Department
Name	Prof. Dr Mahmoud Fahmy	Assoc. Prof. Dr. Amany Sarhan
Name (Arabic)	أ.د. محمود فهمى	أ. د.م. أماني سرحان
Signature		
Date	/ /2014	/ /2014

Course contents – Course ILOs Matrix

Course Code / Course Title: ***02H1/ Technical English

Course Contents	Course outcomes (ILOs)									
	Knowledge and Understanding		Intellectual Skills				Professional and Practical Skills		General and Transferable Skills	
	A1	A2	B1	B2	B3	B4	C1	C2	D1	D2
Technical reading passages and comprehension questions	X		X		X			X	X	
Grammatical rules and structural patterns used in technical writing	X	X	X			X		X	X	
Technical term study		X		X			X			X
Technical articles for translation from English to Arabic and vice versa		X		X		X	X			X

Course coordinator: Dr. Mahmoud Fahmy

Head of Department: Asso. Prof. Dr. El Sayed Salam

Course Specification

Course Title	**History of Engineering and Technological Sciences**	
Course Code	*****02H2**	
Academic Year	**2015-2016**	
Coordinator	**Prof.Dr. Essat Shoaib**	
Teaching Staff	**Prof.Dr. Essat Shoaib** **Prof.Dr. AbdelnabyKabeel** **Prof.Dr. Essam Rashad** **Associate Prof.Dr. Mahmoud A. A. Ali**	
Branch / Level	**-- / The Preparatory Year**	
Semester	**Second**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 2 h lectures**
	Practical	**None**
Parent Department	**The faculty of Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Enhance the vocabularies of the new engineering language.
- Help students in widening their knowledge about the various modern engineering developments.
- Improve the essential theoretical backgrounds and the basic principles in all faculty departments.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Mention various necessary theoretical topics relevant to engineering fields
A2. State the characteristics of the various engineering fields

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Link between different engineering fields
B2. Estimate the future of engineering fields
B3. Conclude on the developments of engineering science

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Verify the relation civilization developments and human science

C2. Verity the relation between engineering and social and economic environment development
C3. Use history information about engineering science in selecting appropriate engineering specialization.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Cooperate and work in a team
D2. Get high self-confidence for leadership and motivation capabilities
D3. Be qualified for self-learning.

3. Course Contents

Week	Topics
1,2	Definitions (art – science – technology – engineering)
3,4	Civilization developments and relation to physical and human science
5,6	History of technology and different engineering branches
7-9	History relation between science and technology
10-12	Relation between engineering and social and economic environment development
13,14	Examples about development of engineering activities

4. Teaching and Learning Methods

4.1- lectures
4.2- General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	2 h	16	80%
Oral Assessment	-	-	-
Practical Examination	-	-	-
Semester work	4.5 hrs	Weeks: 3,7,9,11	20%

6. List of references

Course notes:

- *History of Engineering and Technological Sciences, prepared by teaching staff*

Essential Books: (Text Books)

- *- A. David, METRIC HANDBOOK, PLANNING AND DESIGN, London, Architectural Press, 2000.*
- *- E. G. Garrison, History of Engineering and Technology: Artful Methods, 1998*
- *- The Newcomen Society for the Study of the History of Engineering and Technology: Transactions; Vol 69, no.2., 1997 - 1998*
- *- The Newcomen Society for the Study of the History of Engineering and Technology: Transactions; Vol 66, 1994 - 1995*

Web sites:

- *To be cited during the course*

7. Facilities required for teaching and learning

- P.C, data show, and portable display screen.

	Course Coordinator	Head of Department
Name	Prof. Dr. Essat **Shoaib**	Prof. Dr. Essat **Shoaib**
Name (Arabic)	**أ.د عزت شعيب**	**أ.د عزت شعيب**
Signature		
Date	13/2/2016	13/2/2016

Course contents – Course ILOs Matrix **Academic Year:** 2015-2016

Course Code/Course Title: History of Engineering and Technological Sciences / ***02H2

Course Contents	Course outcomes ILOs										
	Knowledge and Understanding		Intellectual Skills			Professional and Practical Skills			General and Transferable Skills		
	A1	A2	B1	B2	B3	C1	C2	C3	D1	D2	D3
Definitions (art – science – technology – engineering)	x	x				x			x		
civilization developments and relation to physical and human science	x						x				x
History of technology and different engineering branches		x			x			x		x	
History relation between science and technology				x	x			x			
Relation between engineering and social and economic environment development	x			x	x		x	x			x
Examples about development of engineering activities	x	x	x	x		x					

Course coordinator: Prof. Dr. Essat **Shoaib** **Head of Department:** Prof. Dr. Essat **Shoaib**

Course Specification

Course Title	**Engineering Mathematics (2) a**	
Course Code	**PME1106**	
Academic Year	**2014-2015**	
Coordinator	**Dr. Mohamed Elborhamy**	
Teaching Staff	**Dr. Mohamed Elborhamy**	
Branch / Level	**First Year - Electrical Engineering**	
Semester	**First Term**	
Pre-Requisite		
Course Delivery	**Lecture**	**14 x 3 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Electrical Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Acquire the basics of differentiation and integration for several variables functions.
- Acquire the basics of vector analysis and integral theorems.
- Discuss Taylor series for functions of several variables.
- Discuss the phenomena represented by differential equations.
- Help using different methods for solving first order differential equations.
- Assist dealing with n^{th} order differential equations and get solution if it is possible.
- Discuss Euler equation and solve it.
- Encourage dealing with the required analysis of ordinary differential equations to solve RLC electrical circuits in time domain.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define ordinary and partial derivatives and the basics of vector analysis as well as the integral theorems.

A2. Illustrate the different methods for solving first order differential equations.

A3. Describe how the N-order differential equations can be transformed into system of first order differential equations and explain their solution.

A4. Define Taylor and Macluarin's expansion for several variables functions.

A5. Mention various types of ordinary differential equations.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze problems related to differentiation and integration of functions that have several variables.

B2. Apply the vector analysis and vector integral theorems in the engineering fields .

B3. Suggest the suitable method for solving any given first order differential equation.

B4. Formulate the N- order differential equation, moments of inertia, and centroid for any system.

B5. Evaluate Taylor series expansion for any function.

B6. Create differential equations related to any electric circuit and suggest its method of solution.

B7. Evaluate the solution of Euler equation.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Diagnose a wide class of ordinary differential equations.

C2. Design Taylor and Macluarin's series of functions with several variables.

C3. Collect different methods of solving ordinary differential equations.

C4. Design some applications of differential equations like RLC circuits.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in team- work groups.

D2. Face unexpected problems and exercises.

D3. Develop personal skills to communicate with others.

D4. Use general basics for self and continuous learning.

D5. Manage the process of handling different duties and tasks within the required time efficiently and the least possible resources.

3. Course Contents

Week	Topics

1,2	Differentiation and integration of functions of several variables.
3	Taylor and Macluarin's series of function of several variables.
4,5	Vector analysis and integral theorems
6	Differential equations.
7,8	Methods of solutions of first order differential equations.
9,10,11	N- Order differential equations using differential operators.
12	Euler equation
13,14	Applications of solving differential equations of RLC electrical circuits in time domain (over damped, under damped and resonance cases)

4. Teaching and Learning Methods

1- Lectures.
2- Tutorials.
3- Exercise\ solved – problem classes.
4- Problem sheet assignments.
5- Research skills development.
6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hours	Week 16	68 %
Oral Assessment	----------	----------	0.0 %
Practical Examination	----------	----------	0.0 %
Semester work	5 hours	Through semester	32%

6. List of references

- Course notes:

Staff members- faculty of Engineering- tanta university, "Engineering mathematics, First year ".

- Essential Books:

1. Chandrupatla, Tirupathi R, Belegundu, Ashok D. "Introduction to engineering mathematics", Prentice Hall of India, 2006.

2. E. Kreyszig "Advanced Engineering Mathematics" 11th edition , John Wiley and Sons , Inc. 2009

7. Facilities required for teaching and learning

Data show set, power point software, white board and erasable markers.

Course Coordinator: Dr. Mohamed Elborhamy

Head of Department: Prof. Dr. Mona Darweesh

Date: 1/ 10 / 2014.

First Term 2014-2015

University: Tanta **Faculty**: Engineering

Department: Engineering Physics and Mathematics

Course: Engineering Mathematics (2a) **Code:** PME1106

Hours per week: 5

Lecture: 2 **Tutorial:** 2 **Practical: --** **Total: 4**

ILOs	a Knowledge and Understanding							b Intellectual Skills							c Professional and Practical Skills				D General and Transferable Skills			
Topic	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	b5	b6	b7	c1	c2	c3	c4	d1	d2	d3	d4
1	X							X	X						X					X		
2		X								X							X				X	
3			X							X						X				X		
4		X						X								X						X
5			X							X						X			X			
6	X					X					X				X						X	
7		X										X						X	X			
8				X				X								X						X
9			X		X			X					X				X				X	
10					X	X		X		X				X			X		X			
11				X			X		X				X			X		X		X		

Course Coordinator: Dr. Mohamed Elborhamy

Head of Department: Prof. Dr. Mona Darweesh

Date: 1/ 10 / 2014.

First Year
Electrical Engineering

Course Specification

Course Title	**Electrical Circuits(1)**	
Course Code	**EPM 1101**	
Academic Year	**2015-2016**	
Coordinator	**Prof. Dr. Essam Eddin Mohammed Rashad**	
Teaching Staff	**Dr. Fayza Abd El-Rahman Safan-Dr. Mohamed kamal ElNemr**	
Branch / Level	**Electrical engineering/ First year**	
Semester	**First term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 4 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Electrical Power and Machines Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Help in basic analysis to solve currents and voltages in each branch of dc and ac circuits
- Acquire the relations between currents, voltages, power, and power factor
- Enhance dealing with active, reactive and apparent power in ac circuits
- Enable learning the basic terminology of ac waves

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Mention the main components of dc and ac circuits
A2. Reveal Ohm's and Kirchhoff's laws and their application in series, parallel and series-parallel circuits in both dc and ac circuits
A3. State the method of analysis of the electrical circuits (branch-current analysis and Node and Mesh methods) in both dc and ac circuits
A4. Enumerate the circuit theorems in both dc and ac circuits
A5. Identify the active, reactive and apparent power and the method of power factor improvement
A6. Mention the types of filters
A7. Identify the parameters used in two port networks

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Differentiate between various connections of circuit elements
B2. Compare between the various methods of circuit analysis
B3. Differentiate between the different circuit theorem and the suitable one for each circuit
B4. Analyze the circuit that contain both ac and dc electrical sources
B5. Link between the absorbed power depending on the load type and the improvement of the overall circuit power factor
B6. Compare between series and parallel resonance

B7. Differentiate between low pass filter, band pass filter, high pass filter and band stop filter

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Solve different circuits including series and parallel forms in the correct form
C2. Derive simplified circuits from the complicated ones
C3. Verify the obtained results using different solving techniques
C4. Derive various parameters for two port networks
C5. Design the different passive filters using resonance circuits

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Familiarize the students with the correct methods of dealing with the equipments
D2. Learn how to carry out different requested tasks in a team group
D3. Learn how to solve any circuit containing electronic devices.

3. Course Contents

Week	Topics
1-2	Principles of ac circuits, RMS value, average value and phasor diagram.
3-4	series, parallel and series-parallel ac circuits
5	Methods of analysis (branch-current analysis, Nodal analysis, and Mesh analysis)
6- 8	Electric circuit theorems (Super-position, Thevenin, Norton, Maximum power transfer Millman, reciprocity, and substitution theorems)
9-10	Power triangle in ac circuits and power factor improvement
11	Series and parallel resonance circuits
12	Filters , their types and principle of operation
13-14	Two port networks

4. Teaching and Learning Methods

4.1-Lecturs
4.2-Problems solving
4.3-Web-sites show and demonstration
4.4-General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3	15	60 %
Oral Assessment	1	13	10 %
Practical Examination	1	13	10 %
Semester work	2	7, 12	20%

6. List of references

Course notes:

Essential Books:

- *R.L. Boylested "introductory circuit analysis" Prentice Hall; 12 edition (2010).*
- *J. Nilson & Riedel "Electric circuits", Prentice Hall; 9 edition (2010).*
- *W. J. Hayt and J.E. Kemmerly "Engineering Circuit Analysis" Mc Gram Hill Science/Engineering/Math; 7 edition (2007).*

Web sites:

- *To be cited during the course*

7. Facilities required for teaching and learning

- *Electric circuit lab.*
- *Data show and computer*

	Course Coordinator	Head of Department
Name	Prof. Dr. Essam Eddin Mohammed Rashad	Prof. Dr. Essam Eddin Mohammed Rashad
Name (Arabic)	أ. د. عصام الدين محمد رشاد	أ. د. عصام الدين محمد رشاد
Signature		
Date	14/9/2014	14/9/2014

8. Course contents – Course ILOs Matrix **Academic Year 2015-2016**

Course Code /Course Title: EPM 1101/ Electrical Circuits (1)

Course Contents	Course outcomes ILOs																					
	Knowledge and Understanding							Intellectual							Practical					Transferable		
	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	D1	D2	D3
Ohm's and Kirchhoff's laws, series, parallel and series-parallel dc circuits																						
Principles of ac circuits, RMS value, average value and phasor diagram.	X	X						X							X							
series, parallel and series-parallel ac circuits	X							X														
Methods of analysis (branch-current analysis, Nodal analysis, and Mesh analysis)		X							X	X					X					X		X
Electric circuit theorems (Super-position, Thevenin, Norton, Maximum power transfer Millman, reciprocity, and substitution theorems)			X														X			X		
Power triangle in ac circuits and power factor improvement				X							X					X	X			X	X	X
Series and parallel resonance circuits					X							X								X		X
Filters , their types and principle of operation							X						X						X			
Two port networks						X								X					X			

Course coordinator: Assoc. Prof. Dr. Ahmed Mohamed Refaat Azmy **Head of Department:** Prof. Dr. Essam Eddin Mohammed Rasha

Course Specification

Course Title	**Electrical and Electronic Materials**	
Course Code	**EEC/EPM 1160**	
Academic Year	**2015-2016**	
Coordinator	**Prof. Dr. Ahmed Mohamed Refaat Azmy**	
Teaching staff	**Prof. Dr. Ahmed Mohamed Refaat Azmy, Associate Prof. Salah Eldeen khami, and Associate Prof. Mahmoud Ahmed Attia Ali**	
Branch / Level	**Electrical engineering/ First year**	
Semester	**First term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 3 h lectures**
	Practical	**14 x 1 h practical**
Parent Department	**Electrical Power and Machines Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

This course aims at providing the basic knowledge required by practicing engineers for dealing with economics and operation of power systems in order to:

- Improve information about electric and magnetic polarization and dipole moment
- Recognize the characteristics of piezoelectricity and Ferro electricity
- Acquire relations about different polarization types
- Enhance the knowledge about dielectric and magnetic materials
- Enhance the practice about the Dielectric losses and magnetic Dipole moments
- Realize the principles of superconductivity and the Josephson junction.
- Support the learning of types of crystals
- Help to know the semiconductor and transport of carriers
- Improve semiconductor application

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Identify the dielectric constant, the electric dipole moment and the polarization
A2. Mention the conditions and applications of piezoelectricity and Ferro electricity
A3. Identify the frequency dependence of electronic polarizability and ionic polarization as a function of frequency
A4. Outline the types of magnetic materials
A5. State the relations used to calculate the Dielectric losses
A6. Determine the types and applications of superconductivity and Josephson junction.
A7. Classify types of solids and type of crystals
A8. State diffusion and drift current
A9. Match the work phototransistors - solar cells - lasers - leds

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Differentiate between electric and magnetic dipole moments
B2. Recognize the conditions of occurring the piezoelectricity and Ferro electricity
B3. Predict the frequency dependence of electronic polarizability and ionic polarization
B4. Compare the characteristics of different types of magnetic materials
B5. Develop the relations used to calculate the Dielectric losses
B6. Distinguish the types of superconductors and crystals
B7. Differentiate between different type of semiconductor application

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply the relation between the dielectric constant and frequency
C2. Calculate the polarizability and dipole moment for different types of polarization
C3. Apply the suitable formulas to calculate the Dielectric losses
C4. Solve the relations related to the magnetic circuits
C5. Apply the relations describing the types of superconductors
C6. Utilize operations of semiconductor and transport of carriers
C7. Confirm the relations of semiconductors for certain applications
C8. Apply the most appropriate electronics methodology

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Collect suitable data about selected topics
D2. Corporate to process the collected data
D3. Follow up the team work principles to write technical reports

3. Course Contents

Week	Topics
1	Static dielectric constant and electric dipole moment
2	Polarization and dielectric constant
3	Ferro electricity and Piezoelectricity
4	Frequency Dependence of electronic polarizability and Ionic polarization as a function of frequency
5	Magnetic polarization, Diamagnetism and paramagnetism and Ferromagnetism
6	Dielectric losses and magnetic Dipole moments
7	Thermoelectricity, Thermo-magnetic effects, Superconductivity and the josphson junction.
8	Crystals
9	Semiconductors
10	Applications (phototransistors - solar cells - lasers - leds)
11	Dielectric materials under static fields
12	Dielectrics under alternating fields
13	Thermal effects

14	Magnetic materials

4. Teaching and Learning Methods

4.1- Lectures

4.2-Problems solving

4.3-Web-sites show and demonstration

4.4-General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3	15	70%
Oral Assessment	-	-	-
Practical Examination	-	-	-
Semester work	5 (overall)	Weeks: 2, 5, 6, 10, 12, 13	30%

6. List of references

Course notes:

- *Dr. Ahmed Refaat, "Electrical And Electronic Materials", Electrical Power and Machines Department, Faculty of Engineering, Tanta University*

***Essential Books**:*

- *Jones ،I. P , " Materials science for electrical and electronic engineers ", Oxford University Press, Oxford, New York, 2001*
- *kasap;s.o, " principles of electrical engineering materials and devices", mcgraw-hill, boston, 2000*
- *Charles A. Harper and Ronald M. Sampson, " Electronic materials and processes handbook", McGraw-Hill Professional Publishing; 2 edition (1993).*
- *W. Tillar Shugg, " Handbook of electrical and electronic insulating materials", IEEE Press; 2 edition (1995)*
- *Zachariason ،Rob, "Electrical materials", Delmar Cengage Learning; 2 edition (2011).*
- *Merrill L. Minges, "Electronic Materials Handbook, Vol. 1", CRC Press; 1st Printing; Volume 1 edition (1989).*

Web sites:

- *To be cited during the course*

7. Facilities required for teaching and learning

- *Electric material lab.*
- *Data show and computer*

	Course Coordinator	Head of Department
Name	Assoc. Prof. Dr. Ahmed Mohamed Refaat Azmy	Prof. Dr. Essam Eddin Mohammed Rashad
Name (Arabic)	أ.د. أحمد محمد رفعت عزمى	أ. د. عصام الدين محمد رشاد
Signature		
Date	28/9/2015	28/9/2015

8. Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code /Course Title: **EEC/EPM1160** / Electrical and Electronic Materials

Course Contents	Course outcomes ILOs																										
	Knowledge and Understanding									Intellectual							Practical								Transfer-able		
	A 1	A 2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3
Static dielectric constant and electric dipole moment	x									x								x							x	x	
Polarization and dielectric constant	x									x	x								x							x	
Ferro electricity and Piezoelectricity		x										x								x							x
Frequency Dependence of electronic polarizability and Ionic polarization as a function of frequency			x									x	x				x								x		
Magnetic polarization, Diamagnetism and paramagnetism and Ferromagnetism				x									x					x									x
Dielectric losses and magnetic Dipole moments					x									x					x	x							x
Thermoelectricity, Thermo-magnetic effects, Superconductivity and the josphson junction.					x	x									x					x	x				x		
Crystals							x								x							x				x	
Semiconductors								x	X							x						x	x		x		
Applications (phototransistors - solar cells - lasers - leds)								x	X							x						x	x			x	
Dielectric materials under static fields			x		x									x			x		x	x				x			x
Dielectrics under alternating fields			x		x									x			x		x	x				x			x
Thermal effects						x	x								x					x	x					x	
Magnetic materials				x									x					x								x	

Course coordinator:
Assoc. Prof. Dr. Ahmed Mohamed Refaat Azmy

Head of Department:
Prof. Dr. Essam Eddin Mohammed Rashad

Course Specification

Course Title	**Fundamentals of Logic Design**	
Course Code	**CCE 1102**	
Academic Year	**2015-2016**	
Coordinator	**Assoc. Prof. Dr. Amany Sarhan**	
Teaching Staff	**Assoc. Prof. Dr. Amany Sarhan - Dr. Nada ElShenawy**	
Branch / Level	**Electrical Engineering /First year**	
Semester	**First term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 4 h lectures**
	Practical	**14 x 1 h practical**
Parent Department	**Computer and Control Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Acquaint the student with the principles and theorems of logic systems.
- Introduce the student to the field of logic system analysis and design.
- Provide the student with the skill of practical using of logical gates.
- Assist the student to engage in practical life.

2. Intended Learning outcomes (ILOs)

A. Knowledge and Understanding

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

A1. Describe the logic gates and logic circuits and their simplification methods (map and Boolean algebra).
A2. Mention the concepts of combinational circuits.
A3. State the characteristics of the famous combinational circuits (adders, decoders,....).
A4. State the concepts of sequential circuits.
A5. Describe the famous flip-flops (D, JK,....).
A6. List the design procedure of combinational circuits to satisfy given requirements.

B. Intellectual Skills

By the end of this course, the student will be able to:

B1. Differentiate between logic gates according to their function.
B2. Analyze the combinational circuits and build the corresponding truth table.
B3. Explain the circuit simplification using both Boolean algebra and Karnaugh maps for sequential and combinational circuits.
B4. Integrate the various logic gates and famous circuits to construct large combinational circuits.
B5. Distinguish between combinational and sequential circuits.

C. Professional and Practical Skills

By the end of this course, the student will be able to:

C1. Design and implement the basic combinational and sequential circuits in the lab.

C2. Make digital systems from groups of available modules and apply them practically in the lab.
C3. Verify systematically to the least costly digital design by minimizing the circuit.
C4. Validate the variety of sequential and combinational circuits to obtain their response.

D. General and Transferable Skills

By the end of this course, the student will be able to:

D1. Learn information retrieval skills through books and the WWW.
D2. Learn to work competently among team workers of different task assignments.
D3. Deal with individuals and motivating them for novel ideas.
D4. Learn to make good relations with colleagues, bosses, and clients, and adapt to varying work environments.

3. Course Contents

Week	Topics
1-3	Simplification of logic-gate networks
4-7	Combinational circuits concepts and famous circuits
8-12	Logic systems design
13-14	Sequential circuits

4. Teaching and Learning Methods

4.1- Lectures

4.2- Problem solving

4.3- Lab experiments

4.4- Quizes

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	68 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	6 hrs	Through Term	32 %

6. List of references

Course notes:

- *Amany Sarhan, "Fundementals of logic design," 2014.*

Essential Books:

- *M.M.Mano, 'Digital Design', 5th Ed., Prentice-Hall, 2012.*
- *S.Brown and Z.Vranesic, 'Fundamentals of Digital Logic with VHDL Design', McGraw-Hill, 2011.*

Web sites:

- www.wikipedia.com
- www.ieeexplore.ieee.org
- www.ece.eng.ua.edu

7. Facilities required for teaching and learning

- *Logic lab.*

	Course Coordinator	Head of Department
Name	Assoc. Prof. Dr. Amany sarhan	Assoc. Prof. Dr. Amany sarhan
Name (Arabic)	أ.د.م. أماني سرحان	أ. د.م. أماني سرحان
Signature		
Date	11/ 10 /2014	11/ 10 /2014

Course Specification

Course Title	**Electronics (1)**	
Course Code	**EEC 1101**	
Academic Year	**2015-2016**	
Coordinator	**Prof. Dr. Mustafa M. Abdel Naby**	
Teaching Staff	**Prof. Dr. Mustafa M. Abdel Naby**	
Branch / Level	**-- /first year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 4**	**14 x 4=56 h lectures**
	Practical /Tutorial 2	**14 x 2=28 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Know the principles of semiconductor materials
- Recognize the characteristics of semiconductor diodes and applications
- Realize the dependence of semiconductor diodes on the voltage biasing
- Discuss and analyze the operation of half and full wave rectifier and derive the essential equations
- Know the principles operations of Bipolar Junction Transistor
- Deal with the transistor bias circuits and BJT amplifiers
- Identify various types of bipolar amplifiers topologies and applications
- Develop skills for analyzing the performance of different amplifier circuits and applications.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Understand crystal structure and charge carriers in solids.
A2. Describe how current is produced in a semiconductor.
A3. Describe a diode and how a PN junction is formed.
A4. Analyze the voltage-current characteristics of a diode
A5. Discuss the operation of diodes and explain the diode models and applications
A6. Describe the difference between half wave and full wave rectifier and applications
A7. Define the advantage and limitation of different special –purpose diodes and applications.
A8. Understand transistor parameters and characteristics and use these to analyze a transistor circuit.

A9. Discuss how a transistor is used as a voltage amplifier and an electronic switch.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze the major differences between half and full wave rectifier from points of Efficiency and ripple factor.
B2. Reconstruct different type of power supply filters.
B3. Demonstrate their ability to construct clamping and clipping circuits to use it in wave shaping.
B4. Reconstruct the BJT amplifiers with circuit specifications..
B5. Use their knowledge of circuit theory to analyze the performance of transistor amplifier circuits.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Verify the operations of diodes and explain the three models of diodes.
C2. Diagnose the most appropriate electronic component to achieve the best performance of amplifier circuits.
C3. Apply the dc analysis to perform simple digital logic function and to amplify time-varying signals.
C4. Apply the bipolar small signal equivalent circuit in the analysis of different amplifier circuits.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in team.
D2. Build self-confidence.
D3. Manage time.

3. Course Contents

Week	Topics
1,2	Semi-conductors
3,4	Rectification
5,6,7	Filters in Rectification Circuits
8,9	Typical Applications Of Diode Wave Shaping
10,11,12	Bi-polar Junction Transistor
13,14	Bi-polar Transistor Amplifiers

4. Teaching and Learning Methods

4.1-Lectures.
4.2- Experiments
4.3-Discussions.
4.4-Assignments.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	67%
Oral Assessment	--	--	0.0%
Practical Examination	60-75 minute	On week 15	17 %
Semester work	5h(overall)	On week 3,8,11	16 %

6. List of references

- *Course notes:Mustafa Mahmoud*, " Lecture notes in Electronics (1)"

Essential Books:(Text Books)

- "Microelectronic Circuits", Adel S. Sedra , Kenneth C. Smith, Oxford University Press, Inc2012.
- "Electronic devices and circuit theory", Robert L. Boylestad , Louis Nashelsky, 10 th Ed., Prentice-Hall 2009
- "Electronics Fundamentals: Circuits, Devices and Applications", Thomas L. Floyd, Pearson Education, Inc 2006

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.
7.2- Lab. to implement different experiments related to course material
7.3- Computer Lab with simulation Packages such as MATLAB, and Multisim,

	Course Coordinator	Head of Department
Name	**Prof. Dr. Mustafa M. Abdel Naby**	**Associate Prof. Mahmoud A. A. Ali**
Name (Arabic)	أ.د/ مصطفى محمود عبدالنبى	د. محمود أحمد عطية علي
Signature		
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix

Academic Year: 2015-2016

Course Code /Course Title: EEC 1101 / Electronics (1)

Course Contents	*Course outcomes ILOs*																		
	Knowledge and Understanding						*Intellectual*						*Practical*					*Transferable*	
	A1	*A2*	*A3*	*A4*	*A5*	*A6*	*B1*	*B2*	*B3*	*B4*	*B5*	*B6*	*C1*	*C2*	*C3*	*C4*	*C5*	*D1*	*D2*	*D3*
Semi-conductors	*X*	*X*	*X*	*X*	*X*	*X*		*X*		*X*				*X*		*X*		*X*	*X*	*X*
Rectification	*X*	*X*	*X*	*X*	*X*		*X*		*X*		*X*		*X*	*X*	*X*		*X*	*X*	*X*	*X*
Filters in Rectification Circuits and Applications		*X*	*X*	*X*		*X*		*X*		*X*			*X*		*X*		*X*		*X*	*X*
Typical Applications of Diode Wave Shaping	*X*	*X*		*X*	*X*		*X*	*X*	*X*		*X*		*X*		*X*		*X*		*X*	*X*
Bi-polar Junction Transistor	*X*		*X*		*X*	*X*	*X*		*X*	*X*			*X*		*X*		*X*	*X*	*X*	*X*
Bi-polar Transistor Amplifiers	*X*	*X*	*X*			*X*		*X*		*X*			*X*	*X*		*X*	*X*	*X*	*X*	*X*

Course coordinator :Prof.Dr. Mustafa M. Abdel Naby

Head of Department: Associate Prof. Mahmoud A. A. Ali

Course Specification

Course Title	**Computer Programming (1)**	
Course Code	**CCE 1103**	
Academic Year	**2015-2016**	
Coordinator	**Assoc. Prof. Dr. El Sayed Sallam**	
Teaching Staff	**Assoc. Prof. Dr. El Sayed Sallam - Dr. Dina Mahmoud**	
Branch / Level	**Electrical Engineering /First year**	
Semester	**First term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 2 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Computer and Control Engineering**	
Date of Approval	**28/9/2015**	

Course Aims

The aims of this course are to:

- Introduce the student to the programming methods in high-level Languages
- Familiarize the student with structured programming, flowcharts and pseudo codes.
- Provide the student with the skill of practical using of high-level languages.
- Train in writing programmed solutions to electrical engineering problems.
- Assist the student to engage in practical life.

2. Intended Learning outcomes (ILOs)

A. *Knowledge and Understanding*

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

A1. Describe the programming and algorithms basics.
A2. Define loops and decision making.
A3. Tell the effect of functions and subroutines.
A4. Mention the characteristics of arrays, strings, and pointers.
A5. Define the structured programming and programming approaches.

B. Intellectual Skills

By the end of this course, the student will be able to:

B1. Evaluate the programs written in high-level languages.
B2. Distinguish between the appropriate data types and control structures for the given problem.
B3. Justify the sources of error in the code and debug it.
B4. Criticize the merits of readability, conciseness, efficiency, and productivity in program development.

C. Professional and Practical Skills

By the end of this course, the student will be able to:

C1. Make programs for the solution of a wide range of scientific and engineering problems.
C2. Solve the programs to check its performance for different inputs.
C3. Validate and implement problem aspects and requirements into program concepts.
C4. Use the visual studio software package to write, compile and run programs.
C5. Draw flowcharts and pseudo codes for problems and concert them into code.

D. General and Transferable Skills

By the end of this course, the student will be able to:

D1. Learn information retrieval skills through books and the WWW and to be able to use general IT facilities.
D2. Deal with reports using word editor in an acceptable form.
D3. Learn to make good relations with colleagues, bosses, and clients, and adapt to varying work environments.

3. Course Contents

Week	Topics
1-2	Programming basics
3-4	Loops and decision making
5-6	Functions and subroutines
7-8	Arrays, strings, and pointers
9-10	Structured programming
11-12	Software design principles
13-14	Programming approaches

4. Teaching and Learning Methods

4.1- Lectures

4.2- Lab experiments

4.3- Case studies

4-4- Problem solving

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	60 %
Oral Assessment	15 mins	15	10 %
Practical Examination	15 mins	15	10 %
Semester work	5 hrs	Through Term	20%

6. List of references

Course Notes:

- *El Sayed Sallam, 'Introduction to programming ', 2014.*

Essential Books:

- *H.M. Deitel and P. J. Deitel, 'C++ How to program ', 6th Ed., Prentice-Hall, 2013.*
- *Stephen Prata, "C++ Primer Plus," 6th Ed., Sams, 2011.*
- *Andrew Koenig and Barbra E. Moo, "Accelerated C++: Practical Programming by Example," 4th Ed., Addison Wesley Professional, 2010.*
- *Stanely B. Lippman, Josa E. Lajoie and Barbra E. Moo, "C++ Premiere," 5th Ed., Addison Wesley Professional, 2012.*
- *Bjame Stroustrup, "Programming: Princeples and Practice Using C++," 2nd Ed., Addison Wesley Professional, 2014.*
-

Web sites:

- http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-096-introduction-to-c-january-iap-2011/lecture-notes/
- www-inst.eecs.berkeley.edu/classes-eecs.html#cs
- http://www.doc.ic.ac.uk/~wjk/c++Intro/

7. Facilities required for teaching and learning

- *Software lab*

	Course Coordinator	Head of Department
Name	Prof. Dr. El Sayed Sallam	Assoc. Prof. Dr. Amany Sarhan
Name (Arabic)	أ. د. السيد سلام	أ. د.م. أماني سرحان
Signature		
Date	11/ 10 /2014	11/ 10 /2014

Course Specification

Course Title	**Engineering Mathematics (2) b**	
Course Code	**PME 1206**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Yasser El-Sayed Gamiel**	
Teaching Staff	**Dr. Yasser El-Sayed Gamiel and Dr. Mohamed El Borhamy**	
Branch / Level	**First Year - Electric Engineering**	
Semester	**Second Term**	
Pre-Requisite		
Course Delivery	**Lecture**	**14 x 4 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Computer Engineering, Communication Engineering, and Power Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Acquire the basics of differentiation and integration for several variables functions.
- Discuss Fourier expansion for periodic functions.
- Discuss the phenomena represented by partial differential equations.
- Help using different methods for solving first order differential equations.
- Assist dealing with n^{th} order differential equations and get solution if it is possible.
- Discuss Barsval equality.
- Encourage dealing with the required analysis of partial differential equations to solve several engineering problems.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define ordinary and partial derivatives.

A2. Illustrate the different methods for solving partial differential equations.

A3. Describe how Laplace transform used for solving differential equations.

A4. Define System of linear differential equations of constant coefficients and its solution.

A5. Mention various types of partial differential equations.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze problems related to partial differentiation equations.

B2. Compare between ordinary and partial derivatives.

B3. Suggest the suitable method for solving any given first order differential equation.

B4. Formulate Methods of solution of partial differential equations (D'alembert method, method of separation of variables).

B5. Evaluate Sum of some numerical series.

B6. Create Barsval equality.

B7. Evaluate the solution of some physical problems.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Diagnos a wide class of parial differential equations.

C2. Design Fourier expansion for half and quarter symmetric conditions.

C3. Collect different methods of solving partial differential equations.

C4. Design some applications of differential equations like RLC circuits.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in team- work groups.

D2. Face unexpected problems and exercises.

D3. Develop personal skills to communicate with others.

D4. Use general basics for self and continuous learning.

D5. Manage the process of handling different duties and tasks within the required time efficiently and the least possible resources.

3. Course Contents

Week	Topics
1,2	Expansion of periodic functions by Fourier series.
3,4	Sum of some numerical series
5	Barsval equality

6	Laplace transform and its applications in solving differential equations
7,8	System of linear differential equations of constant coefficients and its solution by matrices- Applications
9,10	Partial differential equations (definitions- properties and normal forms)
11,12	Methods of solution of partial differential equations (D'alembert method, method of separation of variables)
13,14	Applications of solving Partial differential equations

4. Teaching and Learning Methods

1- Lectures.
2- Tutorials.
3- Exercise\ solved – problem classes.
4- Problem sheet assignments.
5- Research skills development.
6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hours	Week 16	68 %
Oral Assessment	----------	----------	0.0 %
Practical Examination	----------	----------	0.0 %
Semester work	5 hours	Through semester	32%

6. List of references

- Course notes:
  Staff members- faculty of Engineering- Tanta university, "Engineering mathematics, First year ".

- Essential Books:

3. Chandrupatla, Tirupathi R, Belegundu, Ashok D. "Introduction to engineering mathematics", Prentice Hall of India, 2006.

4. E. Kreyszig "Advanced Engineering Mathematics" 11th edition , John Wiley and Sons , Inc. 2009

7. Facilities required for teaching and learning

Data show set, power point software, white board and erasable markers.

Course Coordinator **Head of Department**

Name	Dr. Yasser El-Sayed Gamiel	Prof. Dr. Mona Darwesh
Name (Arabic)	د. ياسر السيد جميل	أ. د. منى درويش
Signature		
Date	8/1 /2015	8 / 1 /2015

First Year

Second Term

Course Specification

Course Title	**Electrical Measurements**	
Course Code	**EPM1202**	
Academic Year	**2015-2016**	
Coordinator	**Assoc. Prof. Dr. Ahmed Mohamed Refaat Azmy**	
Teaching Staff	**Assoc. Prof. Dr. Ahmed Mohamed Refaat Azmy**	
Branch / Level	**Electrical Engineering /First year**	
Semester	**Second term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture 4**	**14 x 4 h lectures**
	Practical 2	**14 x 2 h practical**
Parent Department	**Electrical power and machines Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Improve knowledge about basis of electromechanical instruments and their dynamics including the difference between dc and ac instruments.
- Acquire the main principles of moving coil and moving iron instruments and their applications in measuring electrical quantities.
- Help about ac and dc bridges to measure electrical quantities.
- Enhance the principles of different types of transducers and how to use them with electrical measuring instruments to measure non electrical quantities.
- Enable dealing with oscilloscope to measure voltages of electrical signals.
- Encourage defining different types of errors caused by inserting electrical measurement devices into electrical circuits.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. State the main features and utilizations of different types of electrical measuring instruments.

A2. Identify the principles of operations of moving coil instruments and their applications in dc and ac measurements.

A3. Identify the principles of operations of moving iron instruments and their applications in ac and dc measurements.

A4. State the principles of operations of electro-dynamic and electrostatic instruments and their applications in ac and dc measurements.

A5. Determine the mechanisms of transducers and their applications.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Develop the mathematical formulas used in describing the dynamic response of electromechanical instruments.

B2. Evaluate the advantages and the disadvantages of using moving coil in both ac and dc measurements.
B3. Derive the equivalent electric circuit associated with different electromechanical instruments.
B4. Modify electro-dynamic instruments to measure power and power factor.
B5. Extract the mathematical formulas that used to describe the transducers to measure non-electrical quantities.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Measure electrical quantities in different electrical sketched circuits.
C2. Use minimum number of instruments to measure the required electrical quantities in different electrical circuits
C3. Apply suitable formulas to utilize electrical bridges to measure resistance and inductance.
C4. Measure errors caused by inserting electrical measurement devices into electrical circuits.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Cooperate to collect information about certain topics.
D2. Report a main subject through defined groups.
D3. Build self-confidence.

3. Course Contents

Week	Topics
1-2	Basic Definitions, accuracy, precision, Resolution, Sensitivity, bandwidth, and Types of errors.
3	Analogue Instruments: Control, Damping torques, Dynamic response.
4-6	Direct Current Meters (Moving Coil Instruments), Measuring V, I, and R.
7-9	AC Instruments (Moving Iron Instruments), Electro-dynamic Instrument, PMMC with rectifier, Thermo-couple instrument, Wattmeters, Energy meters (Watt-hour meter), Frequency meter, Power factor meter.
10-11	DC and AC bridges (Wheatstone, Kelvin, Capacitance, Inductance, Maxwell, Hay, Schering Bridges).
12-13	Transducers, Externally Powered (RTD, Thermistors, Strain Gauge, ...) and Self Generating Transducers (Thermocouples, Piezo, Photo voltaic).
14	Oscilloscope, Course Revision

4. Teaching and Learning Methods

4.1 Lectures.
4.2 Problems solving.
4.3 Lab experiments

4.3 Web-sites show and demonstration.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 h	16	60
Oral Assessment	0.5 h	15	10
Practical Examination	0.5 h	15	10
Semester work	5 h (Overall)	3, 5, 6, 10, 12	20

6. List of references

Course notes: notes provided by the lecturer

Essential Books:

- *Sawhney, A.K, "Electrical measurements and measuring Instruments", Dhanpat Rai, New Delhi, 2004.*
- *Gupta, J. B. "ELECTRONIC AND ELECTRICAL MEASUREMENTS AND INSTRUMENTATION", S. K. KATARIA & SONS, India, 2006.*
- *A.K. Sawhney: "Electronic Measurement and Instrumentation", Cambridge University Press, 1996.*

Web sites:

- *To be cited during the course.*

7. Facilities required for teaching and learning

- PC, data show, portable display screen.
- Measurement lab.

	Course Coordinator	Head of Department
Name	Assoc. Prof. Dr. Ahmed Mohamed Refaat Azmy	Prof. Dr. Essam Eddin Mohammed Rashad
Name (Arabic)	أ. د.م. أحمد محمد رفعت عزمى	أ. د. عصام الدين محمد رشاد
Signature		
Date	28/9/2015	28/9/2015

8. Course contents – Course ILOs Matrix

Course Code /Course Title: EPM1202/Electrical measurements

Course contents	Knowledge and Understanding					Intellectual Skills					Professional and Practical Skills				General and Transferable Skills		
Topic	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D1	D2	D3
Basic Definitions, accuracy, precision, Resolution, Sensitivity, bandwidth, and Types of errors.	X																
Analogue Instruments: Control, Damping torques, Dynamic response.		X				X											
Direct Current Meters (Moving Coil Instruments), Measuring V, I, and R.		X					X					X					
AC Instruments (Moving Iron Instruments), Electro-dynamic Instrument, PMMC with rectifier, Thermo-couple instrument, Wattmeters, Energy meters (Watt-hour meter), Frequency meter, Power factor meter.			X					X			X				X		
DC and AC bridges (Wheatstone, Kelvin, Capacitance, Inductance, Maxwell, Hay, Schering Bridges).				X					X				X		X		
Transducers, Externally Powered (RTD, Thermistors, Strain Gauge, …) and Self Generating Transducers (Thermocouples, Piezo, Photo voltaic).					X					X				X		X	
Oscilloscope, Course Revision				X					X					X			X

Course coordinator: Assoc. Prof. Dr. Ahmed Mohamed Refaat Azmy **Head of Department:** Prof. Dr. Essam Eddin Mohammed Rashad

Course Specification

Course Title	**Electronics (2)**	
Course Code	**EEC 1202**	
Academic Year	**2015-2016**	
Coordinator	**Prof. Dr. Mustafa M. Abdel Naby**	
Teaching Staff	**Prof. Dr. Mustafa M. Abdel Naby** **Dr. Heba Ali El Khobby** **Dr. Mahmoud Mohamed Mahmoud Selim**	
Branch / Level	**--- /First Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 4**	**14 x 4=56 h lectures**
	Practical / Tutorial 2	**14 x 2=28 h practical /tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Know the physics and structure of MOS Transistors.
- Recognize the characteristics and MOS Transistors models.
- Discuss the difference between Bipolar and MOS devices.
- Deal with the MOS transistor bias circuits and CMOS amplifiers
- Discuss the operation and applications of Thyristors, Diacs and Triacs.
- Realize the dependence of SCS and UJT devices on the voltage biasing
- Know the principles of operations and applications of Photo-Transistor
- Identify various types of optoelectronic devices and applications
- Develop skills for analyzing the performance of different semiconductor Laser, Photo-conductors, and Solar cells.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Understand the quantitative analysis and different parameters of MOSFET.
A2. Analyze the voltage-current characteristics of MOSFET.
A3. Discuss the MOS device models and applications
A4. Describe the difference between Bipolar and MOS devices
A5. Define the advantage and limitation of CMOS amplifiers and applications.
A6. Understand Thyristors parameters and SCR applications.
A7. Discuss how optoelectronic devices are used as an electronic switch.

B. Intellectual skills:

By the end of this course, the students should be able to

B1. Analyze the major differences between CMOS amplifiers from points of Efficiency and appropriate applications.
B2. Reconstruct different types of SCR circuits for different applications.
B3. Demonstrate their ability to use different optoelectronic devices in power control circuits.
B4. Use their knowledge of circuit theory and CMOS parameters to analyze the performance of CMOS transistor amplifier circuits.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Verify the operations of CMOS amplifiers at different regions and application of each.
C2. Diagnose the most appropriate biasing of different amplifiers.
C3. Apply the dc analysis of CMOS to perform simple power control circuits
C4. Apply the CMOS small signal equivalent circuit in the analysis of different amplifier circuits.
C5. Apply the dc analysis of optoelectronic devices to perform simple power control circuits for different applications.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self-confidence
D3. Manage time

3. Course Contents

Week	Topics
1,2,3	Basic structure and operation of MOSFET.
4,5,6	MOS device models and applications
7,8,9	CMOS amplifiers
10,11	Thyristors and other devices
12,13,14	Optoelectronic devices and solar cells

4. Teaching and Learning Methods

- Lectures
- Web-sites show and demonstration
- General reading and discussion
- Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	--	--	--
Practical Examination	60-75 minutes	On week 15	20%
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:

- *Mustafa Mahmoud*, " Lecture notes in Electronics (2)"

Essential Books:

- Microelectronic Circuits", Adel S. Sedra , Kenneth C. Smith, Oxford University Press, Inc.2012.
- "Electronic devices and circuit theory", Robert L. Boylestad , Louis Nashelsky, Prentice-Hall , 10th Ed. , 2009
- "Electronics Fundamentals: Circuits, Devices and Applications", Thomas L. Floyd, Pearson Education, Inc. 2006

Web sites:

To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer Lab with simulation Packages such as MATLAB, and Multisim. .

	Course Coordinator	Head of Department
Name	**Prof. Dr. Mustafa M. Abdel Naby**	**Assoc. Prof/ Mahmoud A. A. Ali**
Name (Arabic)	**ا.دمصطفى محمود عبدالنبى**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix

Academic Year: 2015-2016

Course Code / Course Title: EEC 1202 / Electronics (2)

Course Contents	Course outcomes ILOs									
	Knowledge and Understanding			Intellectual		Practical		Transferable		
	A1	A2	A3	B1	B2	C1	C2	D1	D2	D3
Basic structure and operation of MOSFET	X	X	X	X	X	X	X	X	X	X
MOS device models and applications	X	X	X	X	X	X	X	X	X	X
CMOS amplifiers		X	X	X	X			X	X	
Thyristors, Diacs - Triacs and other devices		X	X	X	X	X	X	X	X	X
Optoelectronic devices and solar cells	X	X	X	X	X	X	X	X	X	X

Course coordinator: ***Prof. Dr. Mustafa M. Abd El Naby*** Head of Department: ***Associate Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Electrical Circuits (2)**	
Course Code	**EPM1203**	
Academic Year	**2015-2016**	
Coordinator	**Prof. Dr. Essam Eddin Mohammed Rashad**	
Teaching Staff	**Prof. Dr. Essam Eddin Mohammed Rashad, Dr. Said Mahmoud Allam**	
Branch / Level	**Electrical Engineering/ First year**	
Semester	**Second term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x3 h lectures**
	Practical	**14 x2 h practical**
Parent Department	**Electrical power and machines Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Acquire the basic science that is related to electric circuits under both transient and steady-state conditions
- Enable the implementation of different theories to analyze electric circuits under transient conditions
- Assist dealing with three-phase electric systems

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Describe the transient behavior of electric circuits.
A2. Mention the advantages of three-phase circuits.
A3. Recognize the concept of mutually coupled circuits.
A4. Identify the operational amplifier terminals.
A5. Recognize the circuit characteristics with non-sinusoidal waveforms.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Differentiate between transient and steady-state responses.
B2. Compare between underdamped, overdamped, and critically damped responses.
B3. Analyze three phase circuits.
B4. Analyze operational-amplifier circuits through terminal behavior.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Verify transient and steady-state responses of RL, RC, and RLC circuits.
C2. Solve steady-state sinusoidal response of balanced three-phase circuits, with star and delta connections, and calculating relevant currents, voltages, power and energy.
C3. Solve circuits with mutually coupled coils.

C4. Apply different theories to periodic (non-sinusoidal) functions on which circuit analysis is based.
C5. Apply Fourier series and Fourier transforms in circuit analysis.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Construct mathematical models of electric systems.
D2. Communicate with electrical and electronics engineers.
D3. Work in groups on design projects of electric networks and systems.

3. Course Contents

Week	Topics
1-4	Transient analysis of RL, RC and RLC circuits
5-6	Three phase circuits
8-7	Magnetically coupled circuits
9-10	Operational amplifier circuits
11-12	Locus of phasor diagrams at variable frequency
13-14	Analysis of electric circuits with non-sinusoidal AC

4. Teaching and Learning Methods

4.1-Lectures
4.2- Problem solving
4.3- Case studies
4.4- Lab

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	15	68%
Oral Assessment	-	-	0
Practical Examination	-	-	0
Semester work	3hrs	Weeks:3,7,8,12	32%

6. List of references

Course notes:

- *Lectures notes*

Essential Books:

- *J. W. Nilsson, "Electric Circuits", Prentice Hall; 9 edition, 2010.*
- *R. J. Smith and R. C. Dorf, "Circuits, Devices, and Systems", John-Wiley, 1992.*
- *R. L. Boylestad, "Introductory Circuit Analysis", Prentice Hall; 12 edition, 2010.*

Web sites:

- *To be cited during the course*

7. Facilities required for teaching and learning:

- Data Show System
- Electric circuit lab.

	Course Coordinator	Head of Department
Name	Prof. Dr. Essam Eddin Mohammed Rashad	Prof. Dr. Essam Eddin Mohammed Rashad
Name (Arabic)	أ. د. عصام الدين محمد رشاد	أ. د. عصام الدين محمد رشاد
Signature		
Date	13/2/2016	13/2/2016

8. Course contents – Course ILOs Matrix

Course Code /Course Title: EPM1203/ Electrical Circuits (2)

Course Contents	Course outcomes ILOs															
	Knowledge and Understanding					Intellectual				Practical					Transferable		
	A 1	A 2	A 3	A4	A5	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4	C 5	D 1	D 2	D3
Transient analysis of RL, RC and RLC circuits	x					x	x			x							x
Three phase circuits		x						x			x						x
Magnetically coupled circuits			x					x				x			x		x
Operational amplifier circuits				x					x				x			x	
Locus of phasor diagrams at variable frequency				x	x			x	x				x	x	x		
Analysis of electric circuits with non-sinusoidal AC					x				x					x	x		

Course coordinator: **Prof .Dr. Essam Eddin Mohammed Rashad** Head of Department**: Prof. Dr. Essam Eddin Mohammed Rashad**

Course Specification

Course Title	**Computer Programming (2)**	
Course Code	**CCE 1204**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Dina Mahmoud**	
Teaching Staff	**Dr. Dina Mahmoud**	
Branch / Level	**Electrical Engineering / First year**	
Semester	**Second term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 2 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Computer and Control Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Acquaint the student with the methods of designing, testing, and evaluating a complete computer program.
- Familiarize the student with ad hoc software packages.
- Train in writing programmed solutions to electrical engineering problems.
- Introduce the student to object-oriented programming.
- Assist the student to engage in practical life.

2. Intended Learning outcomes (ILOs)

A. Knowledge and Understanding :

By the end of this course the student will be able to:

A1. Describe the Characteristics of object-oriented programming.
A2. Mention the usage Streams and Files.
A3. Describe Templates and Exceptions.
A4. Explain some examples of application of programming techniques to electrical engineering problems.

B. Intellectual skills:

By the end of this course, the students will be able to:

B1. Differentiate between high-level and low-level languages.
B2. Distinguish between data structures and classes.
B3. Distinguish between pointers and ordinary variables.
B4. Choose the suitable constructs for a program.
B5. Justify the source of error in the code.

C. Professional and practical skills:

By the end of this course, the students will be able to:

C1. Make computer programs for the solution of a wide variety of problems that contains classes and data structures.
C2. Use the visual studio software package to write, compile and run programs.

C3. Apply Compiling and testing a program.
C4. Validate problem aspects and requirements, especially in electrical engineering, into program concepts and constructs.

D. General and transferable skills:

By the end of this course, the students will be able to:

D1. Learn information retrieval skills through books and the WWW.
D2. Deal with ideas and communicate with others
D3. Learn to present reports using different techniques (computer, manual... etc.).

3. Course Contents

Week	Topics
1-3	Characteristics of object-oriented programming
4-7	Streams and Files
8-11	Templates and Exceptions
12-14	Engineering applications

4. Teaching and Learning Methods

4.1- Lectures

4.2- Lab experiments

4.3- Problem Solving

4-4- Quizes

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	60 %
Oral Assessment	15 mins	15	10 %
Practical Examination	15 mins	15	10 %
Semester work	5 hrs	Through Term	20%

6. List of references

Course notes: Prepared by the lecturer and handed to the students at the lectures.

Essential Books:

- *H.M. Deitel and P. J. Deitel, 'C++ How to program ', 6th Ed., Prentice-Hall, 2013.*

- *Stephen Prata, "C++ Primer Plus," 6th Ed., Sams, 2011.*
- *Andrew Koenig and Barbra E. Moo, "Accelerated C++: Practical Programming by Example," 4th Ed., Addison Wesley Professional, 2010.*
- *Stanely B. Lippman, Josa E. Lajoie and Barbra E. Moo, "C++ Premiere," 5th Ed., Addison Wesley Professional, 2012.*
- *Bjame Stroustrup, "Programming: Princeples and Practice Using C++," 2nd Ed., Addison Wesley Professional, 2014.*
-

Web sites:

- http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-096-introduction-to-c-january-iap-2011/lecture-notes/
- www-inst.eecs.berkeley.edu/classes-eecs.html#cs
- http://www.doc.ic.ac.uk/~wjk/c++Intro/

7. Facilities required for teaching and learning

- *Software lab*

	Course Coordinator	Head of Department
Name	Dr. Dina Mahmoud	Assoc. Prof. Dr. Amany Sarhan
Name (Arabic)	د. دينا محمود	أ. د.م. أماني سرحان
Signature		
Date	11 / 10 /2014	11 / 10 /2014

Course Specification

Course Title	**Computer Hardware**	
Course Code	**CCE1205**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Nada Elshenawy**	
Teaching Staff	**Dr. Nada Elshenawy**	
Branch / Level	**Electrical Engineering / First year**	
Semester	**Second term**	
Pre-Requisite	**NA**	
Course Delivery	**Lecture**	**14 x 2 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Computer and Control Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Familiarize the student with Input/output devices and how to perform intended functions.
- Familiarize the student with Memory system and how to perform intended functions.
- Familiarize the student with Arithmetic/logic modules and how to perform intended functions.
- Introduce the student to the field of embedded systems.
- Introduce the student to the practical life of computer hardware.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Describe input/output organization and their interconnection.
A2. List principles and types of memory system.
A3. Outline components of basic units of computer systems like arithmetic units and processing unit.
A4. State the types of machine instructions and the usage of each.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Relate between the different types of memory.
B2. Differentiate between the different types of interrupts.
B3. Distinguish between the various input/output devices and the characteristics of each.
B4. Comment on the ALU modules, machine instruction sets and the addressing modes.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Illustrate and apply understanding of memory systems, including cache memory.
C2. Design arithmetic modules.
C3. Design a special purpose instruction set.
C4. Combine the various components of computer to build the whole system.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Learn information retrieval skills through books and the WWW.
D2. Deal with ideas and communicate with others
D3. Learn to present reports using different techniques (computer, manual... etc.).

3. Course Contents

Week	Topics
1-3	Input/output organization and operations
4-7	Memory system and operations
8-9	Processing modules
10-11	Arithmetic/logic modules
12-14	Machine instructions and programs

4. Teaching and Learning Methods

4.1- Lectures

4.2- Lab experiments

4.3- Problem Solving

4.4- Quizes

4.5- Group projects

4.6- Reoprts

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	70 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	5 hrs	Through term	30 %

6. List of references

Course book:

- *Amany Sarhan, "Computer Hardware", 2014.*

Essential Books:

- *C. Hamacher, Z. Vranesic, and S. Zaky, 'Computer Organization', 6th Ed., McGraw-Hill, 2011.*
- *David Harris and Sarah Harris, "Digital Design and Computer Architecture," 2nd Edition, Morgan Kaufmann, 2012.*

- *David A. Patterson and John L. Hennessy, "Computer Organization and Design," 5th Ed., Morgan Kaufmann, 2011.*

Web sites:

- www.wikepedia.org
- www-inst.eecs.berkeley.edu/classes-eecs.html#cs
- www.ieeexplore.ieee.org
- www.ece.eng.ua.edu
- www.acm.org

7. Facilities required for teaching and learning

- Hardware lab.

	Course Coordinator	Head of Department
Name	Dr. Nada Elshenawy	Assoc. Prof. Dr. Amany Sarhan
Name (Arabic)	د. ندا الشناوى	أ. د.م. أمانى سرحان
Signature		
Date	١١ / ١٠ /٢٠١٤	١١ / ١٠ /٢٠١٤

Course Specification

Course Title	Engineering Mathematics (3) a	
Course Code	PME 2110	
Academic Year	2015 - 2016	
Coordinator	Dr. Ashraf Al Mahallawy	
Teaching Staff	Dr. Ashraf Al Mahallawy	
Branch / Level	Second Year - Communication and Electronics Engineering	
Semester	First Term	
Pre-Requisite	---	
Course Delivery	**Lecture**	**14 x 3 = 42 h lectures**
	Practical	**14 x 2 = 28 h practical**
Parent Department	Communication and Electronics Engineering	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Acquire the concept and steps of problem solving - mathematical modeling, solution and implementation.
- Discuss the various methods for curve fitting and interpolation (Lagrange, Newton and, spline methods).
- Enable dealing with the different numerical methods used for linear and nonlinear algebraic equations.
- Help using methods of differentiation and integration for finding integrals of continuous functions such as Richardson extrapolation technique, Trapezoidal rule, Simpson's rule, extrapolation technique, and Gauss-quadarture method.
- Encourage dealing with the various numerical methods for solving ordinary differential equations (initial and boundary value problems) and partial differential equations.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Illustrate the basic concepts of Curve fitting via interpolation.

A2. Explain the methods which solve simultaneous linear and nonlinear equations using Naïve Gauss elimination, LU Decomposition, Jacobi, and Gauss-Siedal methods.

A3. Describe the methods of integration and differentiation such as Richardson extrapolation, Trapezoidal rule, Simpson's rule, and Gauss-Quadarture to find derivative and integral of continuous functions.

A4. Mention Euler's method, Runge-Kutta methods, and shooting methods to solve ordinary differential equations that are coupled and/or higher order and initial-value problems.

A5. Draw the methods of solution of boundary value problems such as finite difference and finite element methods.

A6. List the numerical methods of solution of partial differential equation.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Apply the methods of curve fitting and interpolation.

B2. Compare between the different methods of solution of nonlinear equations.

B3. Apply high order numerical technique for numerical differentiation and integration using extrapolation technique.

B4. Apply the suitable numerical method for solving initial value problems.

B5. Suggest numerical algorithm for solving boundary value problems.

B6. Suggest the suitable methods for solving partial differential equations.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Perform mathematical analysis to solve linear and nonlinear algebraic equations.

C2. Design algorithms for simple engineering problems.

C3. Collect suitable mathematical theories to solve ordinary differential equations.

C4. Diagnose the different methods for solving partial differential equations.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in a team- work groups.

D2. Face unexpected problems and solve it.

D3. Develop personal skills to communicate with others.

D4. Use general basics for self and continuous learning.

3. Course Contents

Week	Topics
1,2	Numerical solution of linear and nonlinear algebraic equations
3,4,5	Curve fitting and interpolation

6,7,8	Numerical differentiation and integration
9,10,11,12	Numerical methods for solving ordinary differential equations (initial and boundary).
13,14	Numerical methods for solving partial differential equations

4. Teaching and Learning Methods

1- Lectures.
2- Tutorials.
3- Exercise\ solved – problem classes.
4- Problem sheet assignments.
5- Research skills development.
6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hours	On week 16	68%
Oral Assessment	----------	----------	0%
Practical Examination	----------	----------	0%
Semester work	5 hours	On weeks 3,5,7,8,11,14	32%

6. List of references

- Course notes:
  Waheed K Zahra "Numerical Methods for Engineers, 2009-2010, 1st Edition.

- Essential Books:

1. E. Kreyszig "Advanced Engineering Mathematics" 11th edition, John Wiley and Sons, Inc. 2009.

2. Steven C Chapra, "Applied Numerical Methods with Matlab for Engineers and Scientists", 2nd edition, McGraw-Hill, 2009.

3. Bradie, Brian," A friendly introduction to numerical analysis", Pearson Prentice Hall, 2006.

7. Facilities required for teaching and learning

Data show set, power point software, white board and erasable markers.

	Course Coordinator	Head of Department
Name	Dr. Ashraf Al Mahallawy	Prof. Dr. Mona A Darwish
Name (Arabic)	د. اشرف محمد المحلاوى	أ. د. منى احمد درويش
Signature		
Date	/ /201٤	/ /201٤

Second Year

First term

Course Specification

Course Title	**Electronic Circuits (1)**	
Course Code	**EEC 2103**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Heba Ali El Khobby**	
Teaching Staff	**Dr. Heba Ali El Khobby**	
Branch / Level	**--/second year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 3	**14 x 3=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Acquire the importance of the electronics field in our life.
- Discuss the amplifier circuits.
- Discuss the concepts of feedback and stability.
- Discuss the operation of power amplifiers.
- Discuss the operational amplifier as an important electronic component
- Discuss the oscillators circuits (conditions of oscillation, types, applications)
- Acquire dealing with simulation packages.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define various basic sciences related to the course including circuit's theory.
A2. Explain the main differences between the small- signal amplifiers and high- signal amplifiers.
A3. Illustrate the various classes of power amplifiers.
A4. Mention the operational amplifier various applications such as summing, integrating.
A5. Describe the feedback principle.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Conclude the major differences between small-signal amplifiers and between high-signal amplifiers.
B2. How to analyze an electronic circuit and analyze the stability problem.
B3. Conclude the major differences between positive and negative feedback circuits.
B4. How to think of design to reach the best one.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Verify the best system and the most economical engineering solution.
C2. Diagnose the most appropriate electronics methodology.
C3. Apply the simulation packages such as Multisim in analyzing the electronic circuits.
C4. Design particular commonly used electronic systems.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Cooperate to collect information about certain topics.
D3. Report a main subject through defined groups.
D4. Build self-confidence.

3. Course Contents

Week	Topics
1	Revision: methods of determining the operation of BJTs and FETs
2,3	Feedback
4	Stability
5	Stability/ Power Amplifiers
6,7	Power Amplifiers
8,9	Differential amplifiers
10,11,12,13	Operational Amplifier and its applications
14	Oscillators

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Problems solving.
4.3-Web-sites show and demonstration.
4.4-General reading and discussion.
4.5- lab experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	16	60 %
Oral Assessment	30 minute	15	10%

Practical Examination	30 minute	15	10 %
Semester work	5h(overall)	5,10,12	20%

6. List of references

Course notes:
Lecturer notes in electronic circuits

Essential Books:(Text Books)

- "Microelectronic Circuits", Adel S. Sedra , Kenneth C. Smith, Oxford University Press, Inc. 2007.
- "Electronic devices and circuit theory", Robert L. Boylestad , Louis Nashelsky, Prentice-Hall 2008.
- "Electronics Fundamentals: Circuits, Devices and Applications", Thomas L. Floyd, Pearson Education, Inc. 2006.
- "Electronic design: From concept to reality", Martin Roden; Gordon Carpenter; William Wieserman, Discovery Press (Burbank, CA) 2002.
- "Functional Electronics",K.V. Ramanan 2004.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.
7.2- Computer Lab with simulation Packages such as MATLAB, Multisim.

	Course Coordinator	Head of Department
Name:	**Dr. Heba Ali El Khobby**	**Associate Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. هبه علي الخبى**	**د. محمود أحمد عطية علي**
Signature:		
Date:	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: **EEC 2103 / Electronic circuits (1)**

Course Contents	Course outcomes ILOs															
	Knowledge and Understanding					Intellectual				Practical				Transferable		
	A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3
Revision: methods of determining the operation of BJTs and FETs		X		X			X		X	X			X		X	X
Feedback	X		X	X	X		X	X	X		X	X		X		X
Stability		X	X		X	X		X	X	X	X		X		X	
Power Amplifiers	X			X	X		X	X	X	X		X	X		X	
Differential amplifiers		x	x		x	x		x		X	x			x		x
Operational Amplifier and its applications	X			x		x	x		x	X		x	x		x	

Course coordinator: ***Dr. Heba Ali El Khobby*** **Head of Department:** ***Associate Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Electromagnetic Fields**	
Course Code	**EPM2142**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Ahmed Ibrahim Shobair**	
Teaching Staff	**Dr. Ahmed Ibrahim Shobair**	
Branch / Level	**Second year**	
Semester	**First Term**	
Pre-Requisite		
Course Delivery	**Lecture**	**14 x 3 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Electrical Power and Machines Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

This course aims at providing the basic knowledge required by practicing engineers for dealing with electric and magnetic fields and their applications in order to:

- Help to recognize the importance of electromagnetic fields.
- Acquire the different methods of calculating electric field intensity and flux density.
- Enhance the knowledge about main types of conductors, dielectrics, and semiconductors and identifying their properties and boundary conditions.
- Assist dealing with the steady magnetic field and the magnetic forces on different arrangements of charges.
- Enable identifying time varying fields and Maxwell's equations in point form and integral form.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A7. Define Coulomb's law, Gauss's law, and Divergence theorem

A8. Classify the different arrangements of charge such as point charge, line charge, and sheet of charge

A9. Identify the energy and potential concept of a point charge and a system of charges

A10. Enumerate the uses of Poisson's and Laplace's equations

A11. Understand Biot-Savart law and Ampere's Circuital law and non-salient machines

B. Intellectual skills:

By the end of this course, the students should be able to:

B7. Differentiate between dot product and cross product

B8. Distinguish the different methods used to calculate the electric field intensity

B9. Link the different types of materials and their suitability to the different applications

B10. Justify the methods used to determine the capacitance and inductance

B11. Conclude the main features of steady magnetic field and time varying fields to choose the suitable method of solution.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C5. Apply different coordinate systems to determine the coordinates of any point or vector suitable to deal with charges configurations.

C6. Demonstrate the divergence theorem in calculating electric field intensity

C7. Validate the potential gradient in deriving the boundary conditions between different materials

C8. Put the Laplace's equation and Poisson's equation into practice

C9. Apply Maxwell's equations for steady and time varying fields

D. General and transferable skills:

By the end of this course, the students should be able to:

D5. Collect suitable data about different topics

D6. Cooperate in processing collected data

D7. Build self confidence

3. Course Contents

Week	Topics
1	An overview about vector analysis
2,3	Coulomb's law and electric field intensity
4,5	Electric field density, Gauss's law, and Divergence theorem
6	Energy and potential
7,8	Conductors, Dielectrics, and capacitance
9,10	Poisson's and Laplace's equations
11,12	The steady magnetic field and magnetic forces
13,14	Self and mutual Inductance. Time-varying fields and Maxwell's equations

4. Teaching and Learning Methods

4.1-Lecturs
4.2-Problems solving
4.3-Web-sites show and demonstration
4.4-General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3	15	70%
Oral Assessment	0	0	0
Practical Examination	0	0	0
Semester work	2	7,12	30%

6. List of references

Course notes:

Essential Books:

- *William H. Hayt, Engineering Electromagnetics*
- *M. A. Plonus, Applied Electromagnetics.*

Web sites:

- *To be cited during the course*

7. Facilities required for teaching and learning

- *PC, data show, portable display screen, or*
- *Overhead Projector*

	Course Coordinator	Head of Department
Name	Dr. Ahmed Ibrahim Shobair	Prof. Dr. Essam Eddin Mohamed Rashad
Name (Arabic)	أ. د. أحمد ابراهيم شبير	أ. د.عصام الدين محمد رشاد
Signature		
Date	7/2/2014	7/2/2014

5.5 Course contents – Course ILOs Matrix

Course Code / Course Title: EPM2142/ Electromagnetic Fields

Course Contents	Course outcomes ILOs																	
	Knowledge and Understanding					Intellectual					Practical					Transferable		
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	D1	D2	D3
An overview about vector analysis	X					x					X					x		
Coulomb's law and electric field intensity		X					X					x					x	
Electric field density, Gauss's law, and Divergence theorem	x						x					x						x
Energy and potential			x					x					X					x
Conductors, Dielectrics, and capacitance								x	x				x				x	
Poisson's and Laplace's equations				x			x							x		x		
The steady magnetic field and magnetic forces					x				x	x					X		x	
Self and mutual Inductance. Time-varying fields and Maxwell's equations		x	x							x					x			x

Course Coordinator: **Head of Department:**

Dr. Ahmed Ibrahim Shobair Prof. Dr. Essam Eddin Mohammed Rashad

Date

Course Specification

Course Title	**Communication Theory**	
Course Code	**EEC 2104**	
Academic Year	**2015-2016**	
Coordinator	**Assoc. Prof. Mahmoud Ahmed Attia Ali**	
Teaching Staff	**Assoc. Prof. Mahmoud Ahmed Attia Ali**	
Branch / Level	--/**second year**	
Semester	**first**	
Pre-Requisite	--	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 3	**14 x 3=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Help how to analyze the information signal both in frequency and time domains.
- Investigating a lot of principles such as; the modulation theory, transfer function, characteristic function, output response, convolution and correlations, etc.
- Discuss design constrains for resources such as bandwidth, power, distortion, and noise.
- Acquire the basic concepts of various analogue AM and FM modulation techniques.
- Demonstrate some applications for AM and FM techniques in commercial broadcasting.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Discover the concepts of Fourier series and properties and theorems of Fourier Transform.
A2. Recognize the transfer function and impulse response for various filters, in addition to the characteristics of important functions including voice and video signals.
A3. Define the principles of design of AM and FM systems including the block diagram and circuits of modulation and detection.
A4. Efficient use of various properties of Fourier Transform to get signal spectrum, system response, and system detection.
A5. Recognize search keys and broadcast standards of AM and FM transmission.
A7. Mention current applications using AM and FM techniques.
A10. Acquire the basics of design and analysis of analogue communication systems.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Use the convolution property to get the characteristic function or output response and the frequency shift as a mixer or modulator.
B2. Select appropriate circuits for AM and FM modulation techniques based on analytical relations.
B5. Compare the characteristics of some important functions and evaluate the characteristics and performance of various AM and FM systems.
B12. Analyze the performance of various analogue communication systems.
B13. Synthesize electronic circuits for Wide Band FM techniques.
B16. Evaluate the optimum design of wide band FM techniques.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply knowledge of Fourier Transform and circuit analysis, to deal with distortion problems during the transmission and reception of signals.
C12. Develop the sense of solving problems for identifying appropriate specifications for filters, modulators, and detectors.

D. General and transferable skills:

By the end of this course, the students should be able to:

D2. Work in stressful environment and within constraints.
D4. Build self confidence
D5. Manage time.
D6. Use general basics for self and continuous learning.

3. Course Contents

Week	Topics
1	Signal Analysis and Fourier Series
2	Definition and Properties of Some Important Functions
3,4	Fourier Transform and Its Properties
5,6	System Response, Transfer Function, and Filters
7,8	Amplitude Modulation: Double Side Band and AM
9,10	Single and Vestigial Side Band AM Techniques
11,12	Angle Modulation and Narrow Band Techniques
13,14	Wide Band FM Techniques

4. Teaching and Learning Methods

4.1- Lectures.
4.2- Problems solving.
4.3- Web-sites show and demonstration.
4.4- General reading and discussion.
4.5- Research skills development.
4.6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 15	66.67 %
Oral Assessment	--	--	0.0%
Practical Examination	--	--	0.0%
Semester work	5h(overall)	On week 2,5,7,10	33.33 %

6. List of references

Course notes:

- Mahmoud A. A. Ali, Selected Course on “Principles of Communication", 2014.

Essential Books: **(Text Books)**

- Simon Haykin, "An Introduction to Analogue and Digital Communication Systems”, 2002.
- Simon Haykin, "Communication Systems", John Wiley & sons, 4th Edition, 2006.
- Louis E. Frenzel, “Principles of Electronic Communication Systems”, McGraw Hill, Inc., 2008.
- A. Bruce Carlson and Paul Crilly, “Communication Systems”, 5th Edition, 2009.
- Lathi, Zhi Ding, “Modern Digital and Analog Communication Systems”, 4th Edition, 2009.
- Couch, Leon W., “Digital and Analog Communication Systems”, 8th Edition, 2012.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7.1- Laptop, data show, and portable display screen.

7.2- White board and erasable markers.

	Course Coordinator	Head of Department
Name:	**Assoc. Prof/ Mahmoud A. A. Ali**	**Assoc. Prof/ Mahmoud A. A. Ali**
Name (Arabic)	**د. محمود أحمد عطية علي**	**د. محمود أحمد عطية علي**
Signature:		
Date:	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix

Course Code / Course Title: EE C2104 / Communication Theory **Academic Year 2015-2016**

Course Contents	Course outcomes ILOs																		
	Knowledge and Understanding							Intellectual						Practical		Transferable			
Number	A1	A2	A3	A4	A5	A7	A10	B1	B2	B5	B12	B13	B16	C1	C12	D2	D4	D5	D6
Signal Analysis and Fourier Series	X	X							X						X	X	X	X	X
Definition and Properties of Some Important Functions		X							X						X		X		X
Fourier Transform and Its Properties	X			X			X	X						X		X	X	X	X
Impulse & System Response, Transfer Function, and Filters		X		X				X							X		X		X
Amplitude Modulation: Double Side Band and AM			X		X	X	X	X	X		X				X				X
Single and Vestigial Side Band AM Techniques			X		X	X	X			X	X			X	X				X
Angle Modulation Narrow and Wide Band Analysis			X		X	X	X			X	X				X		X		X
Wide Band FM Modulation Demodulation Techniques			X		X	X	X		X	X	X	X	X		X				X

Course coordinator: ***Assoc. Prof. Mahmoud A. A. Ali*** **Head of Department:** ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Technical Reports**	
Course Code	**EEC 21H3**	
Academic Year	**2015-2016**	
Coordinator	**Prof. Dr.Mustafa M. Abdel Naby**	
Teaching Staff	**Prof. Dr.Mustafa M. Abdel Naby**	
Branch / Level	**-- /second year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 2**	**14 x 2=28 h lectures**
	Practical /Tutorial	**0 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Acquire the basic information, styles and expressing ideas concisely for writing technical report.
- Help students to be familiar with writing a complete technical report about certain engineering project.
- Encourage students to communicate with others in a perfect way.
- Provide the students with basic knowledge required to write and read convincing technical reports and academic essays with greater fluency.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define the different types of technical writing and its technique.
A2. List the methods of writing a report.
A3. Define the need of illustrations and report design
A4. Understand the importance of ethical issues in technical reports.
A5. Write a job letter and CV.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Compare between different types of technical reports.
B2. Integrate each part of report with other parts smoothly.
B3. Use graphical elements in technical reports.
B4. Develop a style in an interesting and readable manner
B5. To create audience analysis in oral communications.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Diagnose title page based on different writing types.
C2. Apply different writing stylesin technical report.
C3. How a weak report can be improved.
C4. Revise a selection of already assessed technical papers to prepare better report
C5. Apply common issues when working in a team environment to create technical reports.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work effectively in a team.
D2. Collaborative writing as a part of total team effort.
D3. Collect data and constructing a solid technical report by avoiding incorrect sentences

3. Course Contents

Week	Topics
1,2,3,4	Writing process and ethical issues in technical reports
5,6,7	Report design
8,9	Technical Written reports
10,11	Graphical elements in technical reports
12,13,14	Job letters and basic rules of English grammar

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Oral presentation
4.3-Web-sites search for different technical papers.
4.4-General reading and discussion.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	2h	On week 16	80 %
Oral Assessment	--	--	0.0%
Practical Examination	--	--	0.0%
Semester work	3h (overall)	On week 5 and 9	20 %

6. List of references

Essential Books:(Text Books)

- Brenda Wegmann, "A ReadingSkillls Book" McGrew-Hill ,2006

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

- PC, data show, portable display screen.

	Course Coordinator	Head of Department
Name	Prof. Dr.Mustafa M. Abdel Naby	Associate Prof. Mahmoud A. A. Ali
Name (Arabic)	أ.د مصطفى محمود عبد النبي	د. محمود أحمد عطية علي
Signature		
Date	28/9/2015	28/9/2015

5.5 Course contents – Course ILOs Matrix Academic Year: 2015-2016

Course Code / Course Title: EEC 21H3/ Technical Reports

Course Contents	Course outcomes ILOs																		
	Knowledge and Understanding					Intellectual						Practical					Transferable		
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	D1	D2	D3
Writing process and ethical issues in technical reports	X	X		X	X		X		X			X	X		X	X	X	X	X
Report design and technical written reports	X	X	X	X	X		X	X		X	X		X	X		X	X		X
Graphical elements in technical reports		X	X	X	X	X		X	X	X		X	X			X		X	X
Job letters and basic rules of English grammar		X		X	X		X	X	X		X	X		X		X		X	X

Course coordinator: ***Prof. Dr. Mustafa M. Abd El Naby*** Head of Department: ***Associate Prof. Mahmoud A. A. Ali***

Second Year

Second Term

Course Specification

Course Title	Engineering Mathematics (3) b	
Course Code	PME 2210	
Academic Year	2012 - 2013	
Coordinator	Dr.Waheed K. Zahra	
Teaching Staff	Dr.Waheed K. Zahra	
Branch / Level	--/ Second Year	
Semester	Second Term	
Pre-Requisite	---	
Course Delivery	Lecture	14 x 2 = 28 h lectures
	Practical	14 x 2 = 28 h practical
Parent Department	Physics and Engineering Mathimatics	
Date of Approval	13/2/2016	

1. Course Aims

The aims of this course are to:

- Discuss the concept of vector analysis.
- Assist finding Fourier's series.
- Enable dealing with Fourier transform.
- Encourage dealing with the basic idea of special functions such as Legendre's equation, Legendre polynomials, Bessel's equation and Bessel's function.
- Enable dealing with the solution of partial differential equation in three dimension using separation of variable method in spherical polar coordinates.
- Provide numerical methods for solving partial differential equations.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define the basic concept of vector analysis.

A2. Mention the difference between Fourier's series and Fourier transform.

A3. Illustrate how to express different functions in Fourier's series.

A4. Explain how Fourier transform is used to express engineering phenomena.

A5. Mention the analytical and numerical solution of partial differential equation.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze and solve wide variety of problems and exercises of the related subjects listed above.

B2. Compare between Fourier's series and Fourier transform.

B3. Illustrate how to express different functions in Fourier's series.

B4. Analyze difficult engineering problems using Fourier transform.

B5. Suggest a method of solution of partial differential equations.

B6. Apply the numerical methods for solving partial differential equation.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Solve many problems of vector analysis.

C2. Apply numerical methods for solving partial differential equations. Intellectual

C3. Collect information to question and resemble knowledge.

C4. Apply Fourier transform to solve engineering problems. Intellectual

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in team- work groups.

D2. Manage unexpected problems and solve it.

D3. Develop personal skills to communicate with others.

D4. Use general basics for self and continuous learning.

3. Course Contents

Week	Topics
1,2,3	Vector analysis
4,5,6	Fourier's series
7,8,9	Fourier transform
10,11	Solution of partial differential equation in three dimension
12,13,14	Numerical solution of partial differential equations

4. Teaching and Learning Methods

1- Lectures.
2- Tutorials.
3- Exercise\ solved – problem classes.
4- Problem sheet assignments.
5- Research skills development.
6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3hours	On week 15	70%
Oral Assessment	----------	----------	0%
Practical Examination	----------	----------	0%
Semester work	5 hours	Weeks 3,5,8,11,14	30%

6. List of references

- Course notes:

  Abdel Aziz Abo khadra& Mohamad Shokry, "Engineering mathematics, second year".

- Essential Books:

4. E. Kreyszig "Advanced Engineering Mathematics" 11th edition, John Wiley and Sons, Inc. 2009.

5. Steven C Chapra, "Applied Numerical Methods with Matlab for Engineers and Scientists", 2nd edition, McGraw-Hill, 2009.

6. K.A. Stroud, J.Dexter; "Engineering Mathematics"; Booth 2003.

7. Banerjee Amar Kumar; Dey Anindya "Metric spaces and complex analysis", new AGE, 2008.

7. Facilities required for teaching and learning

Data show set, power – point software, white board and erasable markers.

	Course Coordinator	**Head of Department**
Name	Dr.Waheed K. Zahra	Prof. Dr. Abdel Aziz Abo khadra
Name (Arabic)	د.وحيد زهرة	**أ. د. عبد العزيز ابو خضره**
Signature		
Date	/ /2012	/ /2012

5.5 Course contents – Course ILOs Matrix

Course Code / Course Title: PM2210 /Engineering Mathematics (3) b

Course Contents	Course outcomes ILOs																
	Knowledge and Understanding					Intellectual						Practical				Trans	
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	D1	D2
nalysis	X					X						X				X	
s series		X	X			X	X	X						X			X
transform		X		X			X		X						X		X
of partial differential n three dimension				X						X				X			
al solution of partial l equations					X						X		X				

Course coordinator: Dr . **Waheed zahra** **Head of Department:** Prof. Dr . Abdel Aziz Abo khadra

Course Specification

Course Title	**Electronic circuits (2)**	
Course Code	**EEC2206**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Hosam Mohamed Qasim**	
Teaching Staff	**Dr. Hosam Mohamed Qasim**	
Branch / Level	**--/ Second Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 3	**14 x 3=42 h practical /tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss different types of Feedback.
- Discuss benefits of negative feedback and its applications.
- Discuss the conditions of amplifiers and filters stability.
- Define phase margin and gain margin.
- Discuss the operation of the different filter types such as Butterworth and Chebychev
- Design different types of filters using sallen key and multiple feedback circuit.
- Provide the importance of CMOS circuits.
- Assist with simulation packages.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Explain the different type of feedback amplifiers.
A2. Illustrate the filtering principle and analyze its circuits.
A3. Define phase margin and gain margin and stability conditions.
A4. Know the effect of negative feedback on circuit parameters.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze electronic circuit with positive and negative feedback.
B2. Compare the major differences between the various filter types.
B3. Compare the difference between the CMOS and BJT circuits.
B4. Discuss the effect of –ve feedback on circuit parameters.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply negative feedback practically and show how it control circuit parameters.

C2. Apply simulation packages such as Multisim in analyzing the electronic circuits.
C3. Design small projects composed of studied components such as Op Amp, oscillators, filters …etc.
C4. Design Butterworth and Chebychev filters and compare their benefits.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in a team.
D2. Manage time.
D3. Build self confidence
D4. Face unexpected problems and manage to solve it.
D5. Use general basics for self and continuous learning.

3. Course Contents

Week	Topics
1	Types of feedback
2	Benefits of negative feedback
3,4	Effect of negative feedback on circuit parameters.
5,6	Stability and pole location.
8,9	Gain margin and phase margin and pole compensation.
10,11	Types of filters and filter transmission
12	Butterworth and Chebychev filters
13	Filter design using multiple feedback circuit
14	Filter design using Sallen key circuit

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion
- Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	30 minutes	On week 15	10%
Practical Examination	30 minutes	On week 15	10%
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:

Course Notes "Salwa Serag Eldin, Lecture notes on Electronic circuits."

Essential Books:

- "Microelectronic Circuits", Adel S. Sedra, Kenneth C. Smith, Oxford University Press, Inc. 2007.
- "Electronic devices and circuit theory", Robert L. Boylestad , Louis Nashelsky, Prentice-Hall 2008.
- "Electronics Fundamentals: Circuits, Devices and Applications", Thomas L. Floyd, Pearson Education, Inc. 2006
- "Electronic design: From concept to reality", Martin Roden; Gordon Carpenter; William Wieserman, Discovery Press (Burbank, CA) 2002
- "Functional Electronics",K.V. Ramanan 2004

Web sites:

To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Lab.
- Computer Lab with simulation Packages such as MATLAB, Multisim.

	Course Coordinator	Head of Department
Name	Dr. Hosam Mohamed Qasim	Associate Prof. Mahmoud A. A. Ali
Name (Arabic)	د. حسام محمد حسانين قاسم	د. محمود أحمد عطية علي
Signature		
Date	13/2/2016	13/2/2016

Course contents – Course ILOs Matrix

Course Code / Course Title:EEC2206 / Electronic circuits (2)Academic Year: 2015-2016

Course Contents	Course outcomes ILOs																
	Knowledge and Understanding				Intellectual				Practical				Transferable				
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	D5
Types of feedback	X				X				X				X	X			X
Benefits of negative feedback		X				X				X			X	X	X		
Effect of negative feedback on circuit parameters.			X				X				X		X	X		X	
Stability and pole location.				X				X				X	X	X			X
Gain margin and phase margin and pole compensation.				X									X	X	X		X
Types of filters and filter transmission											X		X	X			
Butterworth and Chebychev filters								X				X	X	X			
Filter design using multiple feedback circuit		X									X		X	X		X	
Filter design using Sallen key circuit	X						x						X	X			X

Course coordinator: ***Dr. Hosam Mohamed Qasim*** Head of Department: ***Associate Prof. Mahmoud A. A.Ali***

Course Specification

Course Title	Communication Engineering	
Course Code	EEC 2207	
Academic Year	2015-2016	
Coordinator	Associate Prof Salah Khamise	
Teaching Staff	Associate Prof Salah Khamise & Dr. Heba Al Khobby	
Branch / Level	--/ Second Year	
Semester	Second	
Pre-Requisite	--	
Course Delivery	Lecture 3	14 x 3=42 h lectures
	Practical / Tutorial 3	14 x 3=42 h practical/tutorial
Parent Department	Electronics and Electrical Communication Engineering	
Date of Approval	13/2/2016	

1. Course Aims

The aims of this course are to:

- Enhance the student background and basic knowledge in the field of communication system engineering.
- Acquire the student skills in the defining, analyzing, and solving of problems related to the communication systems.
- Help the students skills in the design of communication sub-systems

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to

A1. Define Basic components of communication systems and their engineering applications.
A2. Explain modulation, detection, and mixing techniques.
A3. Explain FM stereo broadcast and reception
A4. Describe circuits for communication systems.
A5. Know the basics circuits of the different components.
A6. Describe the fundamentals of television engineering
A7. Describe communication sub systems measurement.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Create analytical models for communication system engineering.
B2. Apply communication system engineering problems and search for optimized solution.
B3. Measure communication sub systems

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Perform practical setup preparation, use and maintenance.
C2. Perform Technical report.
C3. Diagnose with customers and suppliers.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2.Cooperate to collect information about certain topics.
D3.Report a main subject through defined groups.
D4. Build self confidence

3. Course Contents

Week	Topics
1	Introduction to communication systems
2,3	Distortion of signal transmission
4,5	Analog transmission and pulse transmission.
6,7	Digital transmission and Linear modulation.
8,9	Frequency conversion, Detection and Frequency division multiplexing.
10	Exponential modulation and FM spectral analysis.
11	Transmitters, receivers, Sampling and pulse modulation.
12,13	Time division multiplexing.
14	Common broadcasting systems.

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Assignments
- Web-sites show and demonstration
- General reading and discussion
- Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	16	60%
Oral Assessment	30minutes	15	10%
Practical Examination	30minutes	15	10%
Semester work	5 hours (overall)	3,5,6,9,12	20%

6. List of references

Course notes:*notes provided by the lecturer*

Essential Books:

1. G. M. Miller, “Modern electronics communication systems”, Prentice Hall, Latest edition, 2007.
2. H. Taub, D. L. Schilling, “Principles of communication systems”, McGraw Hill, latest edition, 2005.

3. AB Carlson, “Communication Systems”, McGraw Hill, Latest Edition,2003.
4. J.Smith,”Modern Communication Circuits”, McGraw-Hill, Latest edition, 2000.

Web sites:

To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Overhead Projector
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	**Associate Prof Salah Khamise**	**Asso. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. صلاح الدين خميس**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: **EEC 2207 / Communication Engineering**

Course Contents	Course outcomes ILOs															
	Knowledge and Understanding					Intellectual				Practical				Transferable			
	A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Revision: methods of determining the operation of BJTs and FETs		X		X			X		X	X			X		X	X	
Feedback	X		X	X	X		X	X	X		X	X		X		X	
Stability		X	X		X	X		X	X	X	X		X		X		X
Power Amplifiers	X			X	X		X	X	X	X		X	X		X		X
Differential amplifiers		x	x		X	x		x		x	x			x		x	
Operational Amplifier and its applications	x			x		x	x		X	x		x	x		x		

Course coordinator**: Associate Prof Salah Khamise** Head of Department: ***Associate Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Electromagnetic waves (1)**	
Course Code	**EEC2208**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Sameh Atef Napoleon**	
Teaching Staff	**Dr. Sameh Atef Napoleon**	
Branch / Level	**--/ Second Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 2	**14 x 2=28 h practical /tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss difference between guided waves as waves between two conducting parallel plates and un guide waves as in free space
- Provide the basic TE and TM waves with their characteristics as Velocities of propagation - attenuation and quality factor - Wave impedance
- Enhance the student skills in the definition, analysis, and solving of problems related to the electromagnetic waves.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Describe the wave propagation equations
A2. Define the Pointing theorem, wave equation and TEM mode in unguided waves.
A3. List Type of media and wave parameters
A4. Mention the transmission lines concepts.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze the transmission media
B2. Measure the characteristics of transmission media as Velocities of propagation -attenuation and quality factor - Wave impedance.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Verify Technical report.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence
D3. Manage time

3. Course Contents

Week	Topics
1,2	Introduction to Wave propagation
3,4,5	Pointing theorem and wave equation
6,7,8	Type of media and wave parameters
9,10,11	Polarization of EM waves and reflection and transmission of plane waves.
12,13,14	High frequency Transmission lines

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	68%
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	32%

6. List of references

1. R. E. Collin,"Foundation for microwave engineering", McGraw Hill International student edition, 2005.
2. W. H. Hayt, Jr., "Engineering Electromagnetics", 8th Edition, McGraw-Hill, 2012

Web sites:

http://www.sophia.org/tutorials/electromagnetic-waves
http://www.colorado.edu/physics/2000/waves_particles/

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer Lab with simulation Packages such as MATLAB.

	Course Coordinator	Head of Department
Name	**Dr. Sameh Atef Napoleon**	**Associate Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. سامح عاطف نابليون**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 2208 / Electromagnetic waves (1)

Course Contents	Course outcomes ILOs									
	Knowledge and Understanding				Intellectual		Practical	Transferable		
	A1	A2	A3	A4	B1	B2	C1	D1	D2	D3
Introduction to Wave propagation		X		X	X	X	X	X		
Pointing theorem and wave equation	X		X		X		X	X	X	X
Type of media and wave parameters	X		X	X		X	X	X	X	
Polarization of EM waves and reflection and transmission of plane waves.			X	X		X	X	X		X
High frequency Transmission lines		X	X	X		X			X	

Course coordinator: ***Dr. Sameh Atef Napoleon*** Head of Department: ***Associate Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	Control Engineering	
Course Code	CCE 2251	
Academic Year	2015-2016	
Coordinator	Dr. Mohamed Arafa	
Teaching Staff	Dr. Mohamed Arafa	
Level	Second year	
Semester	Second term	
Pre-Requisite	None	
Course Delivery	Lecture	14 x 3 h lectures
	Practical	14 x 1 h practical
Parent Department	Computer and control engineering	
Date of Approval	13/2/2016	

1. Course Aims

The aims of this course are to:

- Provide the basic knowledge required by practicing engineers for dealing with the automated machines.
- Assist the student to recognize the control components.
- Enable the student to perform control system analysis.
- Help the students to recognize the main methods of system response evaluation and the main characteristics of control system design.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Describe the construction and the theory of operation of automatic control.
A2. List the control components.
A3. Enumerate the necessary condition for system stability
A4. Draw the Nyquist diagrams.
A5. Mention the characteristics of root loci and Bode plots.
A6. Define PID controller and state space.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Distinguish between the different types of control system in terms of sensitivity, stability, and frequency response.
B2. Justify the advantages and the disadvantages of control system compensation in the frequency domain.
B3. Develop the control system representation through differential equations, block diagrams, and signal flow graphs.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C5. Apply the root loci, Nyquist diagrams and Bode plots in control system analysis and design
C6. Make the experiments for compensation networks for control systems.
C7. Solve feedback control systems via pole-placement techniques.
C8. Put into practice the popular control devices such as PID (Proportional-Integral-Derivative) controllers.
C9. Solve problem using with MATLAB software package in studying control systems.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Obtain information retrieval skills through books and the WWW and to be able to use general IT facilities.
D2. Work competently among team workers of different task assignments.
D3. Share ideas and communicate with others

3. Course Contents

Week	Topics
1-2	System control concepts
3	Control components
4	Control measurements
5	Role of computers as a controller
6-7	Stability and Root Locus
8-9	Nyquist diagram
10	Bode plots
11-13	Control electronic, PID controller and state –variable approach
14	Computer aided analysis and design of control systems

4. Teaching and Learning Methods

4.1- Lectures

4.2- Problems solution

4.3- Reports

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	16	70 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	4 hrs	Weeks: 3,4,6,8,9,10,11	30 %

6. List of references

Course notes:

- Prepared by the lecturer and handed to the students at the lectures.
- G. F. Franklin, J. D. Powell, and A. Emami-Naeini, 'Feedback Control of Dynamic Systems ', 5th Ed., Pearson, Prentice-Hall, 2006.
- B. C. Kuo and F. Golnaraghi, 'Automatic Control Systems ', 8th Ed., John Wiley, 2003.
- R. C. Dorf and R. H. Bishop, 'Modern Control Systems ', 9th Ed., Prentice-Hall, 2001.
- P. N. Paraskevopoulos, 'Modern Control Engineering ', Marcel Dekker, 2002.

Web sites:

- www-inst.eecs.berkeley.edu/classes-eecs.html#cs
- www.ieeexplore.ieee.org
- www.ece.eng.ua.edu

7. Facilities required for teaching and learning

- *Process control lab.*

	Course Coordinator	Head of Department
Name	Dr. Mohamed Arafa	Assoc. Prof. Dr. Amany Sarhan
Name (Arabic)	د. محمد عرفة	أ. د.م. أماني سرحان
Signature		
Date	11/ 10 /2014	11/ 10 /2014

Course contents – Course ILOs Matrix

Course Code / Course Title: CCE 2251/ Control Engineering

Course Contents	Course outcomes (ILOs)																
	Intellectual Skills						General and Transferable Skills			Professional and Practical Skills					General and Transferable Skills		
	A1	A2	A3	A4	A5	A6	B1	B2	B3	C1	C2	C3	C4	C5	D1	D2	D3
System control concepts	X						X									X	
Control components		X					X					X		X	X		X
Control measurements			X					X		X						X	X
Role of computers as a controller			X				X				X		X	X	X		
Stability and Root Locus			X					X	X	X		X		X		X	
Nyquist diagram	X			X			X	X	X	X		X		X	X	X	X
Bode plots					X		X	X	X	X		X		X	X		
Control electronic, PID controller and state – variable approach						X			X		X		X	X			X
Computer aided analysis and design of control systems						X			X		X			X	X	X	

Course coordinator: Dr. Mohamed Arafa **Head of Department: Asso. Prof. Dr. Amany sarh**

Course Specification

Course Title	**Electronic Measurements (2)**	
Course Code	**EEC2209**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Dr. Hosam Mohamed Qasim**	
Teaching Staff	**Dr. Dr. Hosam Mohamed Qasim**	
Branch / Level	**--/ Second Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 2	**14 x 2=28 h practical /tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss the basic types BIT and FET amplifier.
- Provide Logic circuits.
- Provide Transistor hybrid parameters.
- Enhance the Analog and digital circuit simulation (SPICE).
- Discuss the operation of Multi- vibrator, Operational amplifiers and its applications.
- Discuss the AM and FM transmitters, AM and FM receivers and Electronics and Electrics Communication Engineering.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to

A1. Explain the basic measurements techniques.
A2. Describe the difference between Analog and digital circuits.
A3. List the advantage and limitation of Logic circuits.
A4. List the basic differences between the AM and FM transmitters, AM and FM receivers.
A5. Define the fundamental operation of oscillators and Feedback amplifier.
A6. Mention the salient features of Electronics and Electrics Communication Engineering..

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Link the student's skills in analysis of electronic circuits.
B2. Analyze engineering problems.
B3. Analyze the electronic circuits by using simulation programs.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Acquire hands on practical setup preparation, use and maintenance.

C2. Perform Technical report.
C3. Diagnose suitable practical techniques for measurements.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence

3. Course Contents

Week	Topics
1,2	BIT and FET amplifier characterization and Logic circuits.
3,4,5	Transistor hybrid parameters and Analog and digital circuit simulation (PICE).
6,7,8	Multi- vibrator, Operational amplifiers and its applications.
9,10	Oscillators, Feedback amplifiers, power amplifiers and Active filters.
11,12	Power supplies circuits, Communication systems: AM and FM modulation.
13,14	AM and FM transmitters, AM and FM receivers and Electronics and Electrics Communication Engineering.

4. Teaching and Learning Methods

- Lectures
- Experiments
- Problems solving
- Web-sites show and demonstration
- General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	15-30minutes	On week 15	10%
Practical Examination	15-30minutes	On week 15	10%
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:
Taken by the student inside classroom

Essential Books:

1. Oliver & Cage, “Electronic Measurement & Instrumentation”, R.K. Rajput –2012.
2. Helfrick & Cooper, “Electronics Measurements and Instrumentation techniques”, U. A. Bakshi, A.V. Bakshi - 2009.

Web sites:

To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Lab
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	**Dr. Hosam Mohamed Qasim**	**Associate Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. حسام محمد حسانين قاسم**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 2209 / Electronic measurements (2)

Course Contents	Course outcomes ILOs													
	Knowledge and Understanding						Intellectual			Practical			Transferable	
	A1	A2	A3	A4	A5	A6	B1	B2	B3	C1	C2	C3	D1	D2
BIT and FET amplifier characterization and Logic circuits.			X				X		X		X		X	
Transistor hybrid parameters and Analog and digital circuit simulation (PSPICE).	X	X			X		X			X		X	X	X
Multi- vibrator, Operational amplifiers and its applications.			X	X	X	X	X		X		X			X
Oscillators, Feedback amplifiers, power amplifiers and Active filters.	X				X	X	X		X		X	X	X	X
Power supplies circuits, Communication systems: AM and FM modulation.			X	X		X		X	X	X		X	X	X
AM and FM transmitters, AM and FM receivers and Electronics and Electrics Communication Engineering.	X		X	X		X	X		X	X	X		X	

Course coordinator: ***Dr. Hosam Mohamed Qasim*** Head of Department: Associate ***Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	Engineering Mathematics (4)	
Course Code	PME3115	
Academic Year	2014 - 2015	
Coordinator	Dr. Mohamed shokry	
Teaching Staff	Dr. Mohamed shokry	
Branch / Level	Third Year - Communication and Electronics Engineering	
Semester	First Term	
Pre-Requisite	--	
Course Delivery	Lecture	14 x 3 h lectures
	Practical	14 x 2 h practical
Parent Department	Communication and Electronics Engineering	
Date of Approval	28/9/2015	

1. Course Aims

The aims of this course are to:

- Acquire the basics of sets and the theory of probability.
- Discuss the difference between discrete and continuous probability distributions.
- Help using different functions of random variables and recognize its importance in communication systems.
- Discuss the basics of Special functions (Beta, Gamma, and Bessel).
- Assist dealing with the central limit theorem.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Mention some basic laws of sets.

A2. Mention some basics of probability theory and its relation to our life.

A3. Define the basic idea of random variables.

A4. Illustrate the kinds of random variable, the discrete one and the continuous one.

A5. List some functions of random variables.

A6. Describe some types of special functions (Gamma, Beta, and Bessel).

A7. Explain the usage of the central limit theorem.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze many problems of probability and statistics.

B2. Measure the probability of occurrence of an event.

B3. Compare between different types of functions of random variable.

B4. Evaluate probabilities using tables of some probability distributions.

B5. Suggest the suitable special function to solve some integration problems.

B6. Interpret the importance of central limit theory.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Diagnose many problems of probability and statistics.

C2. Design statistical models to formulate engineering problems.

C3. Collect a wide range of statistical, mathematical tools and techniques to design experiments, collect, diagnose and interpret results.

C4. Dissect the use of special functions to solve mathematical problems.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work effectively within a team.

D2. Present personal skills to communicate with others.

D3. Use general basics for self and continuous learning.

D4. Manage the process of handling different duties and tasks within the required time efficiently and the least possible resources.

D5. Adopt unexpected problems.

3. Course Contents

Week	Topics
1,2,3	Set theory and its applications, Probabilities and Conditional probabilities
4,5,6	Random variables and application in communication systems
7,8	Probability density functions
9,10	Continuous and discrete probability functions
11,12,13	Special functions (Gamma, Beta functions error function and Bessel functions)
14	Central limit theorem

4. Teaching and Learning Methods

1- Lectures.
2- Tutorials.
3- Exercise\ solved – problem classes.
4- Problem sheet assignments.
5- Research skills development.
6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hours	On week 16	68%
Oral Assessment	---	---	---
Practical Examination	---	---	---
Semester work	5 hours	Through weeks 3,5,7,8,12,13,15	32%

6. List of references

- Course notes:

  Staff members- faculty of Engineering- tanta university, "Engineering mathematics, third year".

- Essential Books:

1. Navidi, William Cyrus; "Statistics for engineers and scientists", McGraw-Hill Higher Education. 2008.
2. Ross, Sheldon M, "Introduction to probability and statistics for engineers and scientists", Elsevier Academic Press, 2004.
3. E. Kreyszig "Advanced Engineering Mathematics", 11th edition, John Wiley and Sons, Inc. 2009.

7. Facilities required for teaching and learning

Data show set, power point software, white board and erasable markers.

	Course Coordinator	Head of Department
Name	Dr. Mohamed shokry	Prof. Dr. Mouna Darweesh
Name (Arabic)	د.محمد شكرى	أ. د. منى درويش
Signature		
Date	/ /2015	/ /2015

Third Year

First Term

Course Specification

Course Title	**Wave Propagation and Antennas (1)**	
Course Code	**EEC3110**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Amr Hussein Hussein Abdallah**	
Teaching Staff	**Dr. Amr Hussein Hussein Abdallah**	
Branch / Level	**--/third year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x3=42 h lectures**
	Practical /Tutorial 3	**14 x 3=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Help students to build their background and basic knowledge in _ fields of antennas.
- Help students to improve their skills in the definitions, and solving of problems related to antenna.
- Enable students to use software packages to design antennas.
- Help students to be familiar with various types of antennas and wave propagation.
- Discuss radiation from a current element.
- Discuss special antennas such as frequency independent and broad band antennas.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Illustrate the basics of antenna theory.
A2. Describe software packages to solve antenna packages.
A3. Mention different types of antennas.
A4. List the advantages and limitations of each type of antenna families.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Measure the Ability to solve antenna problems and search for the optimized solutions.
B2. Suggest design of antenna for specific application.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Design antenna problems and its different solutions.
C2. Design antennas for specific application.
C3. Apply software packages.

C4. Perform a structural report.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Communicate to have ability to develop ideas and share these ideas with others.

D2. Work in a team.

D3. Build self-confidence.

D4. Use skills related to creative thinking and team work.

3. Course Contents

Week	Topics
1,2	Multiple refection of EM waves between infinite parallel plates.
3,4	Rectangular waveguides, TE and TM modes, Cutoff frequency and propagation parameters.
5,6,7	Power transmitted, wall losses and dielectric losses inside waveguides
8,9,10	TE and TM modes, Cutoff frequency , propagation and power transmitted
11,12	Wall losses and dielectric losses.
13,14	Quality factor, effect of dielectric loss and Circular cavity.

4. Teaching and Learning Methods

4.1- Lectures.
4.2- Problems solution.
4.3- Assignments.
4.4-Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	15-30 minute	On week 15	10%
Practical Examination	15-30 minute	On week 13	10 %
Semester work	5h(overall)	On week 2,5,7,10	20%

6. List of references

Course notes:

- Course notes by Dr. Amr Hussein Hussein Abdullah.

Essential Books:

1. Constantine Balanis, "antenna Theory", John Wiley, Inc., 1996.
2. David M. Pozar, “Microwave engineering”, John whily and Sons, Inc.1998.
3. Joseph Carr, George Hippisley, “Practical Antenna Handbook”, McGraw-Hill/TAB Electronics; 5 edition (Nov. 15 2011).

Web sites: to be sited inside classroom

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.
7.2- Computer Lab with simulation Packages such as MATLAB,
7.3-lab

	Course Coordinator	Head of Department
Name	**Dr. Amr Hussein Abdallah**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. عمرو حسين حسين عبد الله**	**د. محمود أحمد عطية علي**
Signature		
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: **EEC 3110 / Wave Propagation and Antennas (1)**

urse Contents	**Course outcomes ILOs**												
	Knowledge and Understanding				**Intellectual**		**Practical**				**Transferable**		
	A1	A2	A3	A4	B1	B2	C1	C1	C3	C4	D1	D2	D3
ltiple refection of EM waves between inite parallel plates.	X	X			X		X				X		X
ctangular waveguides, TE and TM modes, Cutoff quency and propagation parameters.			X	X		X			X				X
wer transmitted, wall losses and dielectric ses inside waveguides				X		X	X	X			X		
and TM modes, Cutoff frequency , propagation and wer transmitted		X		X		X	X				X		
ality factor, effect of dielectric loss and Circular ity.		X			X	X			X				X

Course coordinator: ***Dr. Amr Hussein Hussein Abdallah*** Head of Department: ***Associate Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Digital Electronics in Communication Systems**	
Course Code	**EEC3111**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Intisar Saeed Gemeeye**	
Teaching Staff	**Dr. Intisar Saeed Gemeeye**	
Branch / Level	**--/third year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 3	**14 x 3=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Discuss General Review on CMOS inverter.
- Be familiar with Noise margin, Propagation delay and power dissipation.
- Be familiar with CMOS circuits, static design, pass transistor and transmission gates.
- Be familiar with CMOS sequential circuits such as Latches, Flip-flops, registers and counters.
- Discuss General Review on Finite state machine and pipelined structure.
  Discuss General Review Non-bistable CMOS circuits like Monostable and Ring Oscillator

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define the basic logic CMOS circuits.
A2. Describe the basic operation of CMOS circuits.
A3. Illustrate the difference between the different IC's families.
A4. Define digital circuits according to the combinational and sequential circuits.
A5. Explain the steps to design a digital circuit.
A6. Define the fundamental operation of non-bistable CMOS Circuits

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. reconstruct combinational and sequential CMOS circuit
B2. Compare between analogue and digital circuits.
B3. Analyze the CMOS circuits by using simulation programs.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. How to build up CMOS circuits.
C2. How to apply simulation packages to verify the digital design.
C3. Verify flip-flops and counters design and operation.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Be tainted to operate with CMOS circuits and numbering systems.
D2. Use the design and analysis skills.

3. Course Contents

Week	Topics
1	CMOS inverter
2,3,4	Noise Margin ,propagation delay and Power dissipation
5,6,7	Pass transistor and transmission gates
8	Dynamic design
9,10,11	Latches, Flip–flops ,Counters
12,13	Finite state machine and Pipelined structure
14	Monostable and Ring Oscillator

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Problems solving.
4.3-Web-sites show and demonstration.
4.4-General reading and discussion.
4.5-Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60 %
Oral Assessment	15 min	On week 15	10%
Practical Examination	15 min	On week 15	10%
Semester work	5h(overall)	weekly	20%

6. List of references

Essential Books:

- "Modern Digital Electronics" by RP Jain Tata McGraw-Hill(2012).
- "Digital Principles & Logic Design" ArijitSaha, N. Manna (2012).
- "CMOS: Circuit Design, Layout, and Simulation" by R. Jacob Baker (2011).

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.
7.2- Computer Lab with simulation Packages such as MATLAB, Multisim.
7.3- Lab

	Course Coordinator	Head of Department
Name	**Dr. Intisar Saeed Gemeey**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. انتصار سعيد جميعي**	**د. محمود أحمد عطية علي**
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC3111/ Digital Electronics in Communication Systems

Course Contents	Course outcomes ILOs													
	Knowledge and Understanding						Intellectual			Practical			Transferable	
	A1	A2	A3	A4	A5	A6	B1	B2	B3	C1	C2	C3	D1	D2
CMOS inverter	X	X					X	X		X			X	
Noise Margin ,propagation delay and Power dissipation			X					X		X			X	
Pass transistor and transmission gates		X		X				X		X			X	X
Dynamic design		X	X	X	X				X			X		X
Latches, Flip–flops ,Counters				X	X		X		X			X		X
Finite state machine and Pipelined structure				X				X	X	X	X	X		X
Monostable and Ring Oscillator				X	X	X			X				X	

Course coordinator: ***Dr. Intisar Saeed Gemeeye*** Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Optical Electronics**	
Course Code	**EEC 3112**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Amr Husain Husain Abdulla**	
Teaching Staff	**Dr. Amr Husain Husain Abdulla** **Dr. Intisar Saeed Gameeye** **Dr. Sameh Atif Napoleon**	
Branch / Level	**-- /third year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 3	**14 x 3=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Discuss the difference between radiometry and photometry.
- Discuss measurement units for photometry.
- Discuss different types of optical sources.
- Discuss optical receivers.
- Be familiar with noise in optical receivers.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define radiometry and photometry.
A2. List different quantities used for measuring photometry.
A3. Describe the optical sources.
A4. Describe the optical receivers.
A5. Explain different noise types in optical receivers.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze the operation of LED, Laser light sources.
B2. Interpret how light detection can be done using photodiodes.
B3. Evaluate the light source and the light detector for each application.
B4. Evaluate the performance of optical detectors.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Perform the luminance of a source.
C2. Show the difference between lens and mirrors.
C3. Verify the optical receiver operation under several operating conditions.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Become skilled at designing optical systems.
D2. Work under pressure
D3. Collect data about optical sources and receivers.

3. Course Contents

Week	Topics
1,2	Radiometry and Photometry
3,4	Elements of Geometric Optics
5,6	Optical Sources
7	LED
8	Lasers
9,10	Optical Receivers
11,12	Photodiodes
13	Avalanche Photo detectors
14	Noise in Optical Receivers

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Problems solving.
4.3-Web-sites show and demonstration.
4.4-General reading and discussion.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 15	67 %
Oral Assessment	--	--	0.0%
Practical Examination	--	--	0.0%
Semester work	5h(overall)	weekly	33%

6. List of references

Course notes:

- *Taken by the student inside classroom*

Essential Books:

- Keigo Iizuka, “Elements of Photonics, Volume II: For Fiber and Integrated Optics”, John Wiley & Sons, Inc._2002.
- J. Gower, “Optical communication systems”, Prentice Hall International, 2nd Edition, 2002.
- C. R. Pollock, “Fundamentals of Optoelectronics”, Richard D. Irwin Inc., 2000.
- Joseph T. Verdeyen., "Laser Electronics", Prentice-Hall Inc., 2000.
- Ivan P. Kaminow, Tingye Li, Alan E. Willner,” Optical Fiber Telecommunications V B, Fifth Edition: Systems and Networks”, 5th ed, Academic Press, 2008.

Web sites:

- To be cited during the course

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.
7.2- Computer Lab with simulation Packages such as MATLAB, and Multisim.

	Course Coordinator	Head of Department
Name	**Dr. Amr Husain Husain Abdulla**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	د. عمرو حسين حسين عبد الله	د. محمود أحمد عطية علي
Signature		
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 3112 / Optical Electronics

Course Contents	Course outcomes ILOs														
	Knowledge and Understanding					Intellectual				Practical			Transferable		
	A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	D1	D2	D3
Radiometry and Photometry	X									X				X	
Elements of Geometric Optics		X									X				
Optical Sources			X					X					X		
LED			X	X		X		X					X		X
Lasers					X	X		X					X		X
Optical Receivers				X				X					X		X
Photodiodes				X			X	X					X		X
Avalanche Photo detectors					X			X					X		
Noise in Optical Receivers					X				X			X	X		

Course coordinator: ***Dr. Amr Husain Husain Abdulla*** Head of Department: ***Assoc. Prof. Mahmoud A. A. A***

Course Specification

Course Title	**Artificial Neural Networks**	
Course Code	**CCE 3153**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Wael Elawady**	
Teaching Staff	**Dr. Wael Elawady**	
Branch / Level	**Electronics and Electrical Communication Engineering/Third year**	
Semester	**First term**	
Pre-Requisite	**None**	
Course Delivery	**Lecture**	**14 x 3 h lectures**
	Practical	**14 x 2 h practical**
Parent Department	**Computer and Control Engineering**	
Date of Approval	28/9/2015	

1. Course Aims

The aims of this course are to:

- Teach the student the basic concepts and mathematical theorems of neural networks.
- Familiarize the student with the different applications of neural networks, especially in control engineering and pattern recognition.
- Assist the student to solve problems and build projects using neural networks technology.
- Encourage the student to understand the new trends and applications of neural networks and natural computing fields.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Mention the relation between Biological neural networks vs. artificial neural networks.
A2. Identify Backpropagation, Feedforward and feedback architectures.
A3. Enumerate and describe the learning techniques.
A4. Describe the single and multi -layer networks
A5. Define the statistical and self organizing neural networks.
A6. List the applications of neural network in control engineering and pattern recognition.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Correlate between neural network as a mathematical model and man's understanding of biological nervous systems.
B2. Grasp the ideas of designing and training a neural network to perform a specific task.
B3. Analyze of learning algorithms: supervised and unsupervised.
B4. Correlate probabilistic neural networks and their stochastic rules.
B5. Determine the applications for which neural networks are suitable.

B6. Choose the appropriate network architecture in the sense of the number of layers and the number of hidden neurons per layer.
B7. Differentiate between the learning algorithms.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply neural network for case studies.
C2. Design and test a neural network for a particular application.
C3. Use system modeling and simulation.
C4. Optimize the system's behavior by applying gradient-descent search techniques to train the neurons.
C5. Simulate neural networks by a software package such as MATLAB.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Perform self study of parts of the course.
D2. Use the internet as a source of continuing learning.
D3. Apply and raise awareness of professional ethics.

3. Course Contents

Week	Topics
1	What is a neural network
2-3	Models and architectures
4-6	Learning techniques
7-8	Single and multi -layer networks
9-10	Associative memory and feedback networks
11-12	Statistical networks
13	Self-organizing networks
14	Applications

4. Teaching and Learning Methods

4.1- Lectures

4.2- Problem solving

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3 hrs	Week: 16	68 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	4 hrs	Weeks: 3,6,8,12	32 %

6. List of references

Course notes: Prepared by the lecturer and handed to the students at the lectures.

Essential Books:

- *S. Kumar, 'Neural Networks: A Classroom Approach', McGraw-Hill, 2004.*
- *Chennakesava R. Alavala, "Fuzzy logic and neural networks: basic concepts &applications," NEW AGE, INDIA, 2008*
- *Simon Haykin, "Neural networks and learning machines," Pearson, N.J., 2009.*

Web sites:

- www.wikipedia.com
- www.ieeexplore.ieee.org
- www.ece.eng.ua.edu

7. Facilities required for teaching and learning

- *Software lab and simulation package*
- *New Books*

	Course Coordinator	Head of Department
Name	Dr. Wael Elawady	Assoc. Prof. Dr. Amany Sarhan
Name (Arabic)	د. وائل العوضى	أ. د.م. أماني سرحان
Signature		
Date	11/ 10 /2014	11/ 10 /2014

Course contents – Course ILOs Matrix

Course Code / Course Title: CCE 3153/ Artificial Neural Networks

Course Contents	Course outcomes ILOs																				
	Knowledge and Understanding						Intellectual Skills							Professional and Practical Skills					General and Transferable Skills		
	A 1	A 2	A 3	A 4	A 5	A 6	B 1	B 2	B 3	B 4	B 5	B 6	B 7	C 1	C 2	C 3	C 4	C 5	D1	D 2	D3
What is a neural network	X						X												X		
Models and architectures		X						X				X	X	X		X			X		
Learning techniques			X						X		X	X	X				X	X	X	X	X
Single and multi -layer networks				X						X				X	X			X		X	
Associative memory and feedback networks				X						X				X	X			X			X
Statistical networks					X												X	X		X	
Self-organizing networks					X						X						X	X		X	
Applications						X		X			X	X		X	X	X	X	X		X	X

Course coordinator: Dr.Wael Elawady
Head of Department: Asso. Prof. Dr. Amany sarha

Course Specification

Course Title	**Optical Communications**	
Course Code	**EEC3213**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Mahmoud Mohamed Mahmoud Selim**	
Teaching Staff	**Dr. Mahmoud Mohamed Mahmoud Selim**	
Branch / Level	**--/third year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 3	**14 x 2=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss optical fiber communications system.
- Discuss signal degradation in optical fibers.
- Enable how to design digital and analog fiber systems.
- Discuss optical amplifiers and networks.
- Be familiar with WDM concepts and components.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1.Define attenuation and dispersion in optical fibers.
A2. Explain different fabrication methods for fiber cables.
A3. Describe different detection devices.
A4.Say examples on digital and analog optical systems.
A5.Mention WDM components.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1.Reconstruct optical fiber communications systems.
B2.Compare between power and rise time budget analysis.
B3.Apply the appropriate source and receiver types for certain fiber link.
B4.Evaluate the performance the optical networks.
B5.Conclude the suitable devices for the optical network.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1.verify optical fiber systems

C2. Solve the power and rise time analysis of fiber systems
C3. Diagnose the maximum allowed distance for communications.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work under pressure.
D2. Build self-confidence.
D3. Work in teamwork.

3. Course Contents

Week	Topics
1,2	Overview of optical fiber communications
3,4	Optical fibers: Structure and Fabrication
5	Signal Degradation in Optical Fiber
6,7	Photo detectors
8,9	Optical Receiver Operation
10	Digital Transmission Systems
11	Analog Systems
12,13	WDM Concepts and Components
14	Optical Amplifiers

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Problems solving.
4.3-Web-sites show and demonstration.
4.4-General reading and discussion.
4.5- Lab Experiments
.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 15	60 %
Oral Assessment	15-30 minute	On week 13	10 %
Practical Examination	15-30 minute	On week 13	10%
Semester work	5h(overall)	On week 2,5,7,10	20%

6. List of references

Course notes:

- Taken by the student inside classroom

Essential Books:

- KeigoIizuka, “Elements of Photonics, Volume II: For Fiber and Integrated Optics”, John Wiley & Sons, Inc._2002.
- M. Ming and K Liu, “Principles and applications of optical communications”, IRWIN 2002.
- Kenji Kawano and Tsutomu Kitoh, “Introduction to optical waveguide analysis: Solving Maxwell’s equations and Schrodinger equation”, John Wiley and Sons Inc., 2001.
- Donald L. Lee, “Electromagnetic principles of integrated optics”, John Wiley and Sons, Inc. 2002.
- M. Cvijetic, “Optical transmission system Engineering”, Artech House 2004
- J. Gower, “Optical communication systems”, Prentice Hall International, 2nd Edition, 2000
- G. Keiser, “Optical fiber communications”, McGraw- Hill Inc., 2007.
- Ivan P. Kaminow, Tingye Li, Alan E. Willner,“Optical Fiber Telecommunications V B, Fifth Edition: Systems and Networks”, 5th ed, Academic.Pres,2008.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.
7.2- Computer Lab with simulation Packages such as MATLAB, and Multisim.
7.3-lab

	Course Coordinator	Head of Department
Name	**Dr. Mahmoud M M Selim**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	أ.د. محمود محمد محمود سليم	د. محمود أحمد عطية علي
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix Academic Year: 2015-2016

Course Code / Course Title: **EEC 3213 / Optical Communications**

Course Contents	Course outcomes ILOs															
	Knowledge and Understanding					Intellectual					Practical			Transferable		
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	D1	D2	D 3
Overview of optical fiber communications																
Optical fibers: Structure and Fabrication	X							X			X					X
Signal Degradation in Optical Fiber	X							X			X					X
Photo detectors			X	X		X		X						X		X
Optical Receiver Operation			X					X			X	X				
Digital Transmission Systems				X		X		X					X			
Analog Systems				X				X		X	X		X		X	X
WDM Concepts and Components					X					X		X		X		
Optical Amplifiers					X				X				X			

Course coordinator: ***Dr. Mahmoud Mohamed Mahmoud Selim*** Head of Department: ***Assoc. Prof. Mahmoud A.A. Ali***

Course Specification

Course Title	**Electromagnetic Waves (2)**	
Course Code	**EEC3214**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Amr Hussein Hussein Abdullah**	
Teaching Staff	**Dr. Amr Hussein Hussein Abdullah**	
Branch / Level	**--/third year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 2	**14 x 2=28 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Help students to build their background and basic knowledge in fields of wave propagation.
- Help students to improve their skills in the definitions, and solving of problems related to transmission lines and waveguides.
- Provide students to use software packages to design transmission lines and waveguides.
- Be familiar with various types of impedance matching techniques.
- Discuss L section network impedance matching.
- Discuss special impedance matching techniques such quarter wave transformer.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define the basics of wave propagation theory.
A2. Describe software packages to solve transmission line problems.
A3. Mention different types of impedance matching techniques.
A4. List the advantages and limitations of each type of impedance matching techniques.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze the ability to solve transmission lines and waveguides problems and search for the optimized solutions.
B2. Suggest design of impedance matching technique for specific application.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply the acquiring the hands-on of practical set up preparation, use and maintenance.
C2. Developing an engineering common-sense to deal with RF and microwave Components and systems.
C3. Ability to deal with suppliers and satisfy the required customer specs.
C4. Solve Technical problem and report writing.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Be trained to work within team.
D2. Use skills related to creative thinking and team work.
D3. Become skilled to have ability to develop ideas and share these ideas with others.
D4. Use time management and project organization.

3. Course Contents

Week	Topics
1	Wave equations
2	Types of transmission lines
3	Transmission line equivalent circuit
4	Current and voltage equations of transmission lines
5	Parameters of lossless and lossy transmission lines
6	Parallel plate waveguide
7	Rectangular waveguide
8	Circular waveguide
9	Impedance matching techniques
10	L-section impedance matching.
11	Quarter wave transformer impedance matching
12	Use of smith chart, single, double and triple stub matching

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Problems solving.
4.3-Web-sites show and demonstration.
4.4-General reading and discussion.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	68%
Oral Assessment	--	--	0.0%
Practical Examination	--	--	0.0%
Semester work	5h(overall)	On week 2,5,7,10	32 %

6. List of references

Essential Books:(Text Books)

- "The Intel Microprocessors", Barry B. Brey.
- Gayle F Miner, "Lines and electromagnetic fields for engineers"
- R. E. Collin, "Foundation for microwave engineering", McGraw Hill International student edition, 2005.
- D. Pozar, "Microwave Engineering", John Wiley & Sons, Inc., 2nd Edition, 2002.
- K. C. Gupta, et al "Micro strip lines and Slot lines", Artech House Publishers, 2001.
- David .K. Cheng "Field and wave electromagnetic", Addison Wesley, New Delhi, 2000.
- Vitaliy Zhurbenko, "Electromagnetic Waves", ISBN 978-953-307-304-0, 522 pages, Publisher: InTech, June 21, 2011.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

- PC, data show, portable display screen
- Computer Lab with simulation Packages such as MATLAB.

	Course Coordinator	Head of Department
Name	**Dr. Amr Hussein Abdullah**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. عمرو حسين حسين عبد الله**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix Academic Year: 2015-2016

Course Code / Course Title: **EEC 3214 / Electromagnetic Waves (2)**

se Contents	Course outcomes ILOs												
	Knowledge and Understanding				Intellectual		Practical				Transferable		
	A1	A2	A3	A٤	B1	B2	C1	C2	C3	C4	D1	D2	D3
e equations	X	X	X	X		X	X	X		X		X	X
orm plane waves		X	X	X		X		X	X		X	X	X
e propagation in free space			X	X		X				X		X	X
ect dielectric, lossy and good conductors		X		X					X	X			
effect and surface impedance		x	X	X	X		X	X			X		X
nal incidence, reflection coefficient and ding wave pattern			X	X		X	X		X			X	X
t impedance, reflection coefficients for zontal and parallel polarization	X	X		X		X		X		X			X
yster angle													
s of polarization			x						x		x		
smission lines types, parameters, tions, voltage and currents, matched mismatched lines				x		x							
of smith chart, single, double and triple matching	x		x			x		x		x			

Course coordinator: ***Dr. Amr Hussein Hussein Abdallah***

Head of Department: Associate ***Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Microprocessor Applications in Communication Systems**	
Course Code	**EEC 3215**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Mohammed Shoaibe Morsy Ahmed**	
Teaching Staff	**Dr. Mohammed Shoaibe Morsy Ahmed**	
Branch / Level	**--/third year**	
Semester	**second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 3	**14 x 3=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Understand the importance of microprocessors in communication systems.
- Gain experience in assembly language programming of microprocessor and its peripherals.
- Be familiar with the concept of interrupt service routines, as well as data processing tasks.
- Know the difference between the microprocessor and microcontrollers and their applications.
- Understand what an embedded system means.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Understand the basic microprocessor architecture.
A2. Name and identify the different microprocessor and microcontroller chips.
A3. Give example for the microprocessor applications in communication systems.
A4. Understand the concept of interfacing and why it is needed

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Evaluate the microprocessor and controller types to choose the optimum for the application.
B2. Construct flow charts for the software solutions.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Build up software solutions for different problems.
C2. Construct troubleshooting steps for tracing hardware and software errors.
C3. Create different assembly and C-programs for some microcontroller types.
C4. Create simple VHDL examples.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Cooperate with team members through case studies.

D1.Be trained to read advanced textbooks and research literature in the field.
D2.Deal with debuggers, compilers, and simulation packages.

3. Course Contents

Week	Topics
1,2	Introduction to Microprocessors systems and Architecture.
3,4	Assembly Language Programming
5,6	Interrupts
7	Microprocessor Timing
8,9	Interfacing Microprocessor to Peripherals
10,11,12	Introduction to Microcontrollers.
13,14	Introduction to Embedded Systems World and VHDL language.

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Problems solving.
4.3-Web-sites show and demonstration.
4.4-General reading and discussion.
4.5 Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	15-30 minute	On week 13	10%
Practical Examination	15-30 minute	On week 13	10%
Semester work	5h(overall)	On week 2,5,7,10	20 %

6. List of references

Essential Books:(Text Books)

- "The Intel Microprocessors", Barry B. Brey2006.
- "Embedded Systems Design", Steve Heath2005.
- "Atmel AVR Microcontroller Primer: Programming and Interfa Barrett and Daniel J. Pack2004.
- "Introduction to Microprocessors and Microcontrollers", John C
- "Microcontrollers and Microcomputers Principles of Software Engineering", Fredrick M. Candy2003.
- "The 8051 Microcontroller and Embedded Systems", Mazidi2000.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.

7.2- Computer Lab with simulation Packages such as processor simulators, micro C and ISE Xilinx.

7.3 Lab

	Course Coordinator	Head of Department
Name	**Dr. Mohammed Shoaibe Morsy**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. محمد شعيب مرسي أحمد**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix Academic Year: 2015-2016

Course Code / Course Title: **EEC 3215 / Microprocessor Applications in Communication Systems**

se Contents	Course outcomes ILOs											
	Knowledge and Understanding				Intellectual		Practical				Transferable	
	A1	A2	A3	A٤	B1	B2	C1	C2	C3	C4	D1	D2
duction to Microprocessors systems Architecture.	X	X	X	X		X	X	X		X	X	X
mbly Language Programming		X	X	X		X		X	X		X	X
rupts			X	X		X				X	X	X
oprocessor Timing		X		X					X	X		
facing Microprocessor to Peripherals		x	X	X	X		X	X			X	X
duction to Microcontrollers			X	X		X	X		X		X	X
duction to Embedded Systems World L language	X	X		X		X		X		X		X
of smith chart, single, double and triple matching	x		x			x		x		x		

Course coordinator: ***Dr. Mohammed Shoaibe Morsy*** Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Digital Signal Processing and Applications (elective course)**	
Course Code	**EEC3218**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Intisar Saeed Gemeey**	
Teaching Staff	**Dr. Intisar Saeed Gemeey**	
Branch / Level	**--/third year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 2**	**14 x 2=28 h lectures**
	Practical /Tutorial 2	**14 x 2=28 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss the importance of digital signal processing and its advantages over analog processing.
- Discuss the main concept of sampling, interpolation and reconstruction.
- Be familiar with Z-transform, DFT and their usefulness in analyzing and designing digital filters.
- Discuss the digital IIR and FIR filters.
- Know how to realize of the digital filters and its practical aspects.
- Discuss the applications of DSP such as speech and image processing.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Explain the sampling process and aliasing problem and how to reconstruct the analog signal.
A2. Define the Discrete time system (DTS) properties such as linearity, stability, causality, time variance and periodicity.
A3. Illustrate the concept of impulse and frequency response of the DTS.
A4. Mention the concepts of correlation and convolution and their applications.
A5. explain the DFT and FFT and their usefulness in frequency domain analysis
A6. Explain and understand the IIR filters design techniques.
A7. Explain and understand the FIR filters design techniques.
A8. Say examples for different DSP applications.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Analyze the DTS in both time domain and frequency domain.
B2. Demonstrate the Z-transform properties and analyze the pole-zero diagrams.

B3. Demonstrate the advantage of FFT in speeding DFT implementation.
B4. Analyze and design IIR filters.
B5. Analyze and design FIR filters
B6. Evaluate the filter response and compare it with the corresponding analog filter if exists.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Confirm the theoretical concepts via MATLAB simulations.
C2. Verify a good thinking of how to realize the digital filters.
C3. Gain experience with the practical aspects when implementing the DSP system on processor such as finite word length effect.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Be trained to trade the system performance with the system complexity.
D2. Be trained to read advanced textbooks and research literature in the field.
D3. Use MATLAB as a powerful simulation tool.

3. Course Contents

Week	Topics
1,2	Discrete Fourier transform FF1'
3	Z Transform
4	Digital Filters
5,6	Adaptive filters
7	Applications of adaptive filters
8	echo cancellers and suppressors
9	Digital signal processing of speech
10,11	Digital image processing
12	Applications of digital signal processing to radar
13	Sonar signal processing
14	Dig tall signal processing in Geophysics.

4. Teaching and Learning Methods

4.1 Lectures**.**
4.2 Problems solution.
4.3 Assignments.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	70 %
Oral Assessment	--	--	0.0%
Practical Examination	--	--	0.0%
Semester work	5h(overall)	On week 2.5.7.10	30 %

6. List of references

Essential Books:(Text Books)

- "Digital Signal Processing - Principles, Algorithms and Applications", J. G. Proakis, and D. G. Manolakis2001.
- "Digital Signal Processing, A Practical Approach", E. C. Ifeachor, and B. W. Jervis2007.
- "Discrete Time Signal Processing", A. V. Oppenheim, and R. W. Schafer2006.
- "The Digital Signal Processing Handbook, Fundamentals of Digital Signal Processing", Vijay. K. Madisetti2000.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7.1- Laptop, data show, portable display screen.
7.2- Computer Lab with simulation Packages such as MATLAB.

	Course Coordinator	Head of Department
Name	**Dr. Intisar Saeed Gemeey**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. انتصار سعيد جميعي**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix

Academic Year: 2015-2016

Course Code / Course Title: EEC3218/ Digital Signal Processing and Applications

ourse Contents	Course outcomes ILOs																			
	Knowledge and Understanding								Intellectual						Practical			Transferable		
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	C1	C2	C3	D1	D2	
iscrete Fourier transform FF1'	X								x						X				X	
Transform		X								X									x	X
igital Filters			X												X				X	
daptive filters				X								X			X	X		X	X	X
pplications of adaptive filter					X								X	X	X	X			x	X
ho cancellers and suppressors						X								X			x		X	X
igital signal processing of speech							x	X	x								x		x	X
pplications of digital signal processing radar						X		X			X				X			X		
onar signal processing							x							X					X	
ig tall signal processing in Geophysics.								X												X

Course coordinator: ***Dr. Intisar Saeed Gameeye***

Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Digital Communication Systems**	
Course Code	**EEC 3220**	
Academic Year	**2015-2016**	
Coordinator	**Assoc. Prof. Mahmoud Ahmed Attia Ali**	
Teaching Staff	**Assoc. Prof. Mahmoud Ahmed Attia Ali**	
Branch / Level	--/**third year**	
Semester	**second**	
Pre-Requisite	--	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 3	**14 x 3=42 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss the importance of digital communication systems in our daily life.
- Be familiar with the concepts of sampling, multiplexing, pulse and digital radio modulation.
- Illustrate the tradeoffs between the different system parameters such as bandwidth, data rate, error rate and complexity.
- Compare the specifications, operation and performance of companding, multiplexing, access algorithms, local area networks, line coding, pulse and digital radio techniques.
- Analyze the performance of higher orders of modulation techniques such as M ary PSK and QAM.
- Show how these digital modulation techniques are used in different communication systems such as satellite, radar, mobile, etc.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Understand the basic concepts of sampling, quantization, coding, companding, multiplexing, and access algorithms.
A2. Explain the baseband modulation formats; PAM, PDM, PPM, Delta, adaptive Delta, PCM, and pass band formats; ASK, FSK, PSK, GMSK, M-ary PSK, and QAM.
A3. Define principles of PCM design including sampling, quantization, and coding processes and recognize the block diagrams, basic circuits and operation of pulse modulation techniques; PAM, PPM, PDM, Delta, and adaptive delta.
A5. Recognize the design standards for Multiplexing, PCM transmission, and various line codes.
A6. Explain requirements for TDMA synchronization in addition to bit error rate, message and channel bandwidth.
A7. Mention current applications of MSK, GMSK, QAM, and M ary PSK.
A10. Describe engineering principles in the fields of companding, line coding, multiplexing, source and channel coding, local area network, in addition to M-ary encoding.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Using of sampling theorem to covert analogue to digital 'A/D'.
B2. Select appropriate sampling rate, minimum quantization error, good companding based on analytical relationships.
B5. Compare and evaluate the performance of different line codes, the bandwidth of various pulse and digital radio techniques, and the characteristics of various multiplexing techniques.
B7. Suggest the appropriate M-ary encoding for a certain data rate according to the permissible bandwidth, probability of error "BER", and signal to noise ratio "SNR".
B12. Analyze the performance of various line codes, ALOHA techniques, local area network, pulse techniques, and digital radio techniques including higher levels of M-ary encoding.
B16. Optimum design of M-ary PSK, and QAM for high rate data transmission.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply the sampling theory and digital concepts and analogue to digital conversion.
C3. Implement different pulse and digital modulation format using lab modules.
C5. Use measuring instruments and laboratory equipment to analyze various multiplexing, pulse and digital radio modulation techniques.
C12. Prepare technical reports for experiments based on various theorems and concepts.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Communicate with team members through Lab. assessments.
D2. Work under pressure.
D4. Build self-confidence.
D5. Manage time.
D6. Use general basics for self and continuous learning.

3. Course Contents

Week	Topics
1, 2, 3	Sampling Theorem, Pulse Modulation Techniques, Delta, and Adaptive Delta.
4, 5, 6	Pulse Code Modulation "PCM", Companding and Formats for Line Codes.
7, 8, 9	Digital Radio: ASK, PSK, FSK, MSK and GMSK, M-ary: QPSK, 8PSK, and QAM.
10,11,12	Carrier and Clock Recovery, Multiplexing: FDMA, TDMA, CDMA, DAMA, ALOHA.
13,14	Channel Capacity, Source and Channel Coding and Local Area Networks.

4. Teaching and Learning Methods

4.1 Lectures.
4.2 Problems solving.
4.3 Assignments (Suspended because there is no Lab).

4.4 Lab experiments (Suspended because there is no Lab).
4.5 Web-sites show and demonstration.
4.6 General reading and discussion.
4.7 Research skills development.
4.8 Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60 %
Oral Assessment	15-30 minute	On week 15	10 %
Practical Examination	15-30 minute	On week 15	10 %
Semester work	5h(overall)	On week 2.6.10	20 %

6. List of references

Course notes:

- Mahmoud A. A. Ali, Selected Topics in "Digital Communication systems", 2014.

Essential Books: **(Text Books)**

- Bernard Sklar, "Digital Communications, Fundamentals and Applications", 2002.
- A. Bruce Carlson and Paul Crilly, "Communication Systems", 5th Edition, 2009.
- Simon Haykin, "Communication Systems", Jone Willy & Sons, 2008.
- Lathi, Zhi Ding, "Modern Digital and Analog Communication Systems", 4th Edition, 2009.
- Couch, Leon W., "Digital and Analog Communication Systems", 8th Edition, 2012.
- Scott R. Bullock, "Transceiver and System Design for Digital Communications", 4th Edition, 2014.
- Rodger E. Ziemer and William H. Tranter, "Principles of Communications", 7th Edition, 2014.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7.1 Laptop, data show, portable display screen.
7.2 Equipped communication Lab.
7.3 White board and erasable markers.

	Course Coordinator	Head of Department
Name:	**Assoc. Prof/ Mahmoud A. A. Ali**	**Assoc. Prof/ Mahmoud A. A. Ali**
Name (Arabic)	**د. محمود أحمد عطية علي**	**د. محمود أحمد عطية علي**
Signature:		
Date:	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix Academic Year 2015-2016

Course Code / Course Title: EEC 3220 / Digital Communication Systems

Course Contents	Course outcomes ILOs																				
	Knowledge and Understanding							Intellectual						Practical				Transferable			
Number	A1	A2	A3	A5	A6	A7	A10	B1	B2	B5	B7	B12	B16	C1	C3	C5	C12	D1	D2	D4	D5	D6
Sampling Theorem, Pulse Modulation Techniques, Delta, and Adaptive Delta.	X	X	X					X	X	X		X		X			X		X	X	X	X
Pulse Code Modulation "PCM", Companding and Formats for Line Codes.		X	X	X			X	X	X	X		X		X	X	X	X	X	X	X	X	X
Digital Radio: ASK, PSK, FSK, MSK, MGSK, M-ary: QPSK, 8PSK, and QAM.		X			X	X	X			X	X	X	X		X	X	X	X	X	X	X	X
Carrier and Clock Recovery, Multiplexing: FDMA, TDMA, CDMA, DAMA, OLOHA.	X			X	X		X			X		X		X		X	X	X	X	X	X	X
Channel Capacity, Source and Channel Coding, and Local Area Networks.							X	X				X		X	X		X	X	X	X	X	X	X

Course coordinator: ***Assoc. Prof. Mahmoud A. A. Ali*** **Head of Department:** ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Acoustics and Ultrasonic**	
Course Code	**EEC 3221**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Intisar Saeed Gameeye**	
Teaching Staff	**Dr. Intisar Saeed Gameeye**	
Branch / Level	**--/third year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 2	**14 x 2=28 h**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss the basic concepts of acoustics.
- Discuss the acoustic wave transmission.
- Discuss the Ultrasonic applications.
- Discuss SONAR system.
- Be familiar with microphones types and systems.
- Help Recognition of speaker's types and systems.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define the vibration principles.
A2. Describe the acoustic wave nature.
A3. List the SONAR system components.
A4. Illustrate the Ultrasonic applications.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Conclude the noise effect on voice systems.
B2. Conclude problems in the SONAR system.
B3. Analyze acoustics in open area environmental.
B4. Evaluate Microphones types and acoustic systems.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply the SONAR equation.
C2. Verify the losses in the voice systems.
C3. Diagnose the ultrasonic applications.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1.Familiarize with the decibel units and its relation with other units.
D2.Use the design and analysis skills.
D3.Become skilled to have ability to develop ideas and share these ideas with others.
D4.Be trained to work within team.

3. Course Contents

Week	Topics
1	Plane and spherical acoustic waves.
2	Simple acoustic sources and applications.
3,4	Acoustic energy transformers.
5,6	Speaker's types and systems.
7,8	Microphones types and systems.
9,10	Measurements-acoustic and sonic –environmental.
11,12,13	Acoustics in open area environmental.
14	Ultrasonic applications.

4. Teaching and Learning Methods

4.1-Lectures.
4.2-Problems solving.
4.3-Web-sites show and demonstration.
4.4-General reading and discussion.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	68%
Oral Assessment	--	--	0.0%
Practical Examination	--	--	0.0%
Semester work	5h(overall)	On week 2,5,7,10	32 %

6. List of references

Essential Books:(Text Books)

- L.E. Kinsler and A.R.Frey, "Fundamentals of Acoustics" Wiley Eastern, 2009.
- Olson, "Acoustical Engineering", Van Nostrand, 2007.
- Leo L.Beranack, "Acoustics", McGraw-Hill, 2005.

Web sites:

- To be cited during the course.

7. Facilities required for teaching and learning

7-1. PC, data show, portable display screen.

7-2. Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinx.

	Course Coordinator	Head of Department
Name	**Dr. Intisar Saeed Gameeye**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. انتصار سعيد جميعي**	**د. محمود أحمد عطية علي**
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: **EEC 3221 / Acoustics and Ultrasonic**

ontents	Course outcomes ILOs													
	Knowledge and Understanding				Intellectual				Practical			Transferable		
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	D1	D2	
l spherical acoustic waves.	X		X		X			X			X	X		
coustic sources and applications.		X		X		X				X				
energy transformers.	X				X					X			X	
s types and systems.			X			X				X				X
ones types and systems.				X		X				X		X		
ments-acoustic and sonic –environmental.	X							X		X		X		X
s in open area environmental		X			X					X	X		X	
s in closed area environmental.					X			X		X		X		
c applications		X				X				X		X		

Course coordinator: ***Dr. Intisar Saeed Gameeye***

Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***

Forth Year
First Term

Course Specification

Course Title	**Satellite Communication Systems**	
Course Code	**EEC 4122**	
Academic Year	**2015-2016**	
Coordinator	**Assoc. Prof. Mahmoud Ahmed Attia Ali**	
Teaching Staff	**Assoc. Prof. Mahmoud Ahmed Attia Ali** **Assoc. Prof. Mahmoud Mohamed Mahmoud Selim**	
Branch / Level	--/ **Fourth Year**	
Semester	**First**	
Pre-Requisite	--	
Course Delivery	**Lecture 4**	**13 x 4=52 h lectures**
	Practical / Tutorial 3	**13 x 3=39 h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Understand the methods of launching of satellites and types of orbits.
- Study the main parameters affecting the satellite launching, including Kepler's laws, and dealing with perturbations of orbits.
- Define principles of design of satellite transponders including wideband receiver and TWT amplifier.
- Recognize the space and Earth subsystems.
- Recognize the block diagram of satellite reception and TV home including design standards for DBS, MATV, and CATV.
- Understand the Geostationary orbit characteristics, Near-geostationary orbits and some related issues to such orbits such as Satellite earth eclipse and sun transit outage
- Analyze the required antenna look angles (i.e., azimuth and elevation angles) to point to satellite, determine the angle of tilt required for a polar mount antenna and calculate the limit of visibility of earth station to track the satellite.
- Describe the different wave propagation impairments encountered in the satellite link such as Atmospheric losses, Ionosphere effects, Rain attenuation analysis and other propagation impairments.
- Evaluate the satellite space links with the definition of important terms such as EIRP, FSL, feeder losses, AML and other transmission losses.
- Define the link-power budget equation.
- Analyze different kinds of noise in the system such as Antenna noise, amplifier noise and absorptive network noise.
- Analyze the carrier to noise ratio metric for Uplink, Downlink and combined link under both clear Sky conditions and weather related conditions (mainly rain).
- Recognize the inter-satellite links with clarifying examples.
- Recognize the GPS system in terms of: system definition, its importance, how it works, how distance is measured, how timing is done in GPS and how error is corrected.
- Recognize three satellite mobile systems (i.e., AceS, Thuraya and MSAT) describing the main characteristics of each.

- Recognize the main characteristics of VSATs
- Understand multiplexing and multiple access techniques and some applications with Intelsat satellites including FDM/FM/FDMA and spade systems.
- Study the operation and performance of ALOHA techniques.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Understand the Kepler's laws based on Newton's gravitation concepts and define various parameters that describe power, antenna gain, EIRP, position, and orientation of satellites in orbits.
A2. Recognize the basics of launching of satellites and dealing with perturbations of orbits.
A3. Define principles of design of satellite transponders including antenna gain, losses, EIRP, wideband receiver and TWT amplifier and recognize the block diagram of satellite reception and TV home reception according to direct broadcasting satellite "DBS". Define principle of Geostationary orbits.
A4. The efficient use of Kepler's laws and Kepler's element set to specify the desired satellite orbit while dealing with power and orbital perturbations. Efficient use of Kepler's laws to explain the characteristics of geostationary orbits.
A5. Recognize the design standards for DBS, MATV, CATV, FDMA, TDMA, FDM/FM/FDMA, SPADE, ALOHA techniques, Demand Assignment.
A7. Mention some INTELSAT applications for both FDMA and TDMA. Explain some current systems such as GPS, ACeS, Thuraya and MSAT
A9. Write a technical report for the MATLAB mini-project.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Using Kepler's laws, theory of probability, and logic concepts to analyze satellite orbits ALOHA techniques.
B2. Select the appropriate value of mean motion by computer iteration using its modified relationship.
B4. Analyze the geometry of satellite link to determine the antenna look angle, angle of tilt, satellite limit of visibility. Analyze the geometry of satellite link to determine the rain attenuation encountered. Analyze the link-power budget equation associated with the satellite link. Analyze the system noise associated with different components of the system.
B5. Compare and evaluate the performance of the transponder due to number of carriers, polarization, and hot standby equipment.
B8. Select the appropriate multiple access technique considering the efficient use of resources, service quality, and security.
B11. Write technical report about the MATLAB mini-project.

B12. Analyze the performance of various multiple access techniques including demand assignment and ALOHA Schemes, and analyze the data collected form telemetry, tracking, and command to estimate the required action to keep the satellite in the preassigned orbit.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply Kepler's laws, gravitation principles, elliptical rules and the perturbation concepts to design and maintain satellite orbit. Use triangulation laws to determine the look angles, angle of tilt and limit of satellite visibility. Use triangulation laws for describing distance measurement in GPS systems.

C3. Build a Satellite system using MATLAB GUI to evaluate antenna look angles and other system metrics.

C9. Provide technical report for the MATLAB mini-project.

C10. Verify exchanging knowledge and skills of satellites in INTELSAT applications compared to demand assignment systems and protocols.

C11. Using a subroutine to define the required inclination angle to maintain the mean motion due to non-spherical Earth.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in pairs during implementation of the MATLAB mini-project

D2. Work in stressful environment and within constraints.

D3. Use Software tools efficiently during the MATLAB mini-project

D4. Build self confidence

D5. Manage time.

D6. Use general basics for self and continuous learning.

D9. Effective communication amongst student during the mini-project of the course.

3. Course Contents

Week	Topics
1, 2, 3	Kepler's Laws, Orbits Perturbation and Spacing, Launching Satellites, Geostationary Satellites, and Satellite Channels
4, 5, 6	Space Segment, Satellite Power, Attitude Control, Station Keeping, Thermal Control, Telemetry, Tracking and Command, in addition to TWT Amplifier DBS, MATV, CATV, Transmit-Receive Earth Stations
7	Multiplexing and Multiple Access, FDM/FM/FDMA, Demand Assignment, ALOHA, SPADE, High rate TDMA.
8, 9, 10, 11	Geostationary orbit- Antenna look angles – Polar mount antenna –limit of visibility – satellite earth eclipse – sun transit outage – Atmospheric loss – Ionosphere loss – Rain attenuation – other propagation impairments - EIRP – Transmission losses – Link-power budget – System noise – Carrier to noise ratio – Rain effect – Midterm Exam
12, 13	Rain effect (cont'd) – Inter-satellite links – Mobile satellite services – VSATs – Mini-project discussion
14	What is GPS – Why GPS – How GPS works – Measurements in GPS system – Timing in GPS – Error correction in GPS

4. Teaching and Learning Methods

4.1 Lectures.
4.2 Problems solving.
4.3 Web-sites show and demonstration.
4.4 General reading and discussion.
4.5 Research skills development.
4.6 Direct reading and independent studies.
4.7 Using software tools such as MATLAB for implementing a mini-project

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	66.67 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	33.33 %

6. List of references

Course notes:

- Mahmoud A. A. Ali, "Selected Topics in Satellite Communications" 2014.

Essential Books:

1.Dennis Roddy, Satellite Communications, McGraw Hill, 3rd edition, 2001.
2.Dennis Roddy, Satellite Communications, McGraw Hill, 4th edition, 2006.
3.T.Pratt, C. Bostian and J. Allnutt; "Satellite Communications", John Wiley and Sons, 2003, Second Edition.
4.Emilio Chuvieco, Jonathan Li, Xiaojun Yang, "Advances in Earth Observation of Global Change", Space Technology Library, 2010.
5.Dennis C. Brewer, "Build Your Own Free-To-Air (FTA) Satellite TV System", Chris Red field, 2011.
6.Miguel A. Aguirre, "Introduction to Space Systems: Design and Synthesis", Space Technology Library, 2013.
7.Teresa M. Braun, "Satellite Communications Payload and System", John Wiley and Sons, 2013.

Web sites:

- URL:http://www.hotcourses.com/uk-courses/Satellite-Communications-courses/hc2_browse.pg_loc_tree/16180339/0/p_type_id/4/p_bcat_id/3861/page.htm
- http://www.trimble.com/gps
- http://celestrak.com/NORAD/elements/

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- White board and erasable markers.

	Course Coordinator	Head of Department
Name:	**Assoc. Prof/ Mahmoud A. A. Ali**	**Assoc. Prof/ Mahmoud A. A. Ali**
Name (Arabic)	**د. محمود أحمد عطية علي**	**د. محمود أحمد عطية علي**
Signature:		
Date:	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix

Course Code / Course Title: EEC 4122 / Satellite Communication Systems
Academic Year 2015-2016

Course Contents	Course outcomes ILOs																							
	Knowledge and Understanding							Intellectual						Practical					Transferable					
Number	A1	A2	A3	A4	A5	A7	A 9	B1	B2	B 4	B5	B 8	B 12	C1	C 3	C 9	C 10	C11	D 1	D2	D4	D 5	D 6	D 9
Kepler's Laws, Orbits Perturbation and Spacing, Launching Satellites, Geostationary Satellites, and Satellite Channels	X	X		X				X	X					X				X		X	X		X	
Space Segment, Satellite Power, Attitude Control, Station Keeping, Thermal Control, Telemetry, Tracking and Command, in addition to TWT Amplifier DBS, MATV, CATV, Transmit-Receive Earth Stations			X		X			X			X		X	X						X	X	X	X	
Multiplexing and Multiple Access, FDM/FM/FDMA, Demand Assignment, ALOHA, SPADE, High rate TDMA.					X	X						X	X								X		X	
Geostationary orbit- Antenna look angles – Polar mount antenna –limit of visibility – satellite earth eclipse – sun transit outage – Atmospheric loss – Ionosphere loss – Rain attenuation – other propagation impairments			X	X						X				X						X	X		X	X
EIRP – Transmission losses - Link-power budget – System noise – Carrier to noise ratio – Rain effect - Rain effect (cont'd) – Inter-satellite links			X	X						X				X						X	X		X	
Mobile satellite services – VSATs – Mini-project discussion - What is GPS – Why GPS – How GPS works – Measurements in GPS system – Timing in GPS – Error correction in GPS						X	X						X	X	X	X			X					X

Course coordinator: ***Assoc. Prof. Mahmoud A. A. Ali*** **Head of Department:** ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Wave Propagation & antennas(2)**	
Course Code	**EEC4123**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Amr Hussein Hussein Abdallah**	
Teaching Staff	**Dr. Amr Hussein Hussein Abdallah**	
Branch / Level	**--/ Fourth Year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical/ Tutorial 3	**14 x 3=42 h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Understanding of the basic principles of wave propagation.
- Be familiar with working knowledge about the different antenna types.
- Study the fundamentals (basics) of antennas.
- Learn the basic principles of antenna Arrays and their advantages over one element.
- Acquire working knowledge of the Application of Antenna in communication.
- Train students to use software packages to design antennas.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define basics of antenna theory.
A2. Describe the fundamental concepts of Antenna parameters.
A3. Identify the main types of antennas as resonant antennas (wires and patches) and travelingwave antennas.
A4. Be aware of the antenna performance which corrupted by noise.
A5. Recognize the advantages and limitations of reflector antenna.
A6. Analyze the basic principles of antenna Arrays and their advantages over one element.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Ability to solve antenna problems and search for the optimized solutions.

B2. Differentiate between the one element radiating systems and antenna arrays.

B3. Compare between resonant and non-resonant antennas (wires and patches).

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Use software packages to solve antenna problems.
C2. Construct design of antenna for specific application.
C3. Create ability for writing a structural report.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence
D3. Manage time
D4. Work under pressure

3. Course Contents

Week	Topics
1	Communication with radio-wave
2	Fundamentals of electromagnetic radiating antenna and antenna impedance
3	Dipoles, Arrays and long wire antenna
4	Biconical antennas
5	Folded dipole antenna &Array pattern synthesis
6	Phased arrays
7	Aperture type antenna
8	Application of field equivalence principles to aperture radiation
9	Open wave-guides and horn antennas
10	Receiving antennas: reciprocity theorem and effective area for antennas
12	Antenna noise temperature
13	Propagation: surface wave propagation& Ionosphere propagation
14	Microwave and millimeter wave propagation & Introduction to microstrip antenna

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion
- Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	15-30minuite	On week 15	10%
Practical Examination	15-30minuite	On week 15	10%
Semester work	--	On week 2,5,7,8,10	20%

6. List of references

Course notes:

Lectures prepared Dr. Amr Hussein Hussein Abdullah

Essential Books:

1. John D Kraus Antennas McGraw Hill, 2002.
2. Constantine Balanis, "antenna Theory", John Wiley, Inc., 2000.
3. Joseph Carr, George Hippisley, “Practical Antenna Handbook”, McGraw-Hill/TAB Electronics; 5 edition (Nov. 15 2011).

Web sites:

Cite during the course.

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Lab
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	**Dr. Amr Hussein Abdallah**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. عمرو حسين حسين عبد الله**	**د. محمود أحمد عطية علي**
Signature		
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 4123 / Wave Propagation & Antennas(2)

Course Contents	Course outcomes ILOs															
	Knowledge and Understanding						Intellectual			Practical			Transferable			
	A1	A2	A3	A4	A5	A6	B1	B2	B3	C1	C2	C3	D1	D2	D3	D4
Communication with radio wave	X			X			X					X	X			
Fundamentals of electromagnetic		X			X			X			X				X	
Dipoles, Arrays and long wire antenna	X					X			X	X		X		X		
Biconical antennas			X				X	X						X		X
Folded dipole antenna& Array pattern		X				X					X	X				
Phased arrays	X				X								X		X	
Aperture type antenna		X		X		X	X				X		X			
Application of field equivalence principles			X						X	X				X		
Open wave-guides and horn antennas	X				X	X		X			X	X				X
Receiving antennas: reciprocity theorem and		X		X			X								X	
Antenna noise temperature	X								X		X					
Propagation: surface wave propagation&			X			X				X		X		X		
Microwave and millimeter wave	X			X			X									X
Introduction to microstrip antenna		X						X					X	X		

Course coordinator: ***Dr. Amr Hussein Hussein Abdallah*** Head of Department:
Assoc. Prof. Mahmoud A. A. Ali

Course Specification

Course Title	**Telecommunication networks**	
Course Code	**EEC4124**	
Academic Year	**2015-2016**	
Coordinator	**Dr.Heba Ali El-Khobby**	
Teaching Staff	**Dr.Heba Ali El-Khobby**	
Branch / Level	**--/ Fourth Year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 3	**14 x 3=42 h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Improve knowledge about basis of networks
- Understand the different classifications of communication networks.
- Be familiar with transmission principles
- Recognize between different transmissions media (Twisted pair, coaxial cable, and optical fiber); their physical characteristics, advantages and disadvantages.
- Understand different transmission impairments like crosstalk, echo, delay, distortion, noise and attenuation; their sources, effects and methods to overcome.
- Encourage defining different switching systems; circuit switching, message switching, and packet switching (virtual circuit and datagram).
- Study data transmission over the public telephone network
- Study the numbering plan for telephone network.
- Study different technical plans for network design; forecasting, signaling, charging, and routing.
- Study the teletraffic engineering.
- Be familiar with traffic measurement.
- Understand queuing theory.
- Recognize difference between loss system and delay system.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Classify communication networks
A2. Recognize different transmission media
A3. Recognize different transmission impairments
A4. Describe different switching systems
A5. Describe different technical plans.
A6. Define traffic concepts
A7. Describe queuing theory
A8. Distinguish between loss and delay system

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Differentiate communication networks
B2. Compare between different transmissions media
B3. Summarize problems of transmission media and their solutions.
B4. Compare different switching systems.
B5. Explain different technical plans
B6. Explain queuing theory
B7. Differentiate the loss and delay system

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Assemble network with certain service requirements
C2. Construct a model for network

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Cooperate to collect information about certain topics.
D2. Report a main subject through defined groups.
D3. Build self-confidence.

3. Course Contents

Week	Topics
1	Classification of communication networks
2	Transmission principles
3	Transmission media
4	Transmission impairments
5	Switching systems
6	Signaling and call establishment
7	Numbering Plan
8	Forecasting plan & Routing plan
9	Charging plan
10	Exchange systems, call establishment and call termination
11	Traffic Engineering
12	Loss system and delay system
13	Queuing theory
14	Overflow system

4. Teaching and Learning Methods

- 4.1 Lectures.

- 4.2 Problems solving.
- 4.3 Assignments
- 4.4 Lab experiments
- 4.5 Web-sites show and demonstration.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	30 minutes	On week 15	10%
Practical Examination	30 minutes	On week 15	10%
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes: *notes provided by the lecturer*

Essential Books:

8.John D Kraus Antennas McGraw Hill, 2002.
9.“Data and Computer Networks”, William Stallings, 2005.
10. "Principles and Practices of interconnection networks", William J. Dally, and Brian Towles, 2001.

Web sites: sites to be cited during the course.

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Overhead Projector
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	**Dr. Heba Ali Al Khobby**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. هبة علي الخبى**	**د. محمود أحمد عطية علي**
Signature		
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix -Course Code Academic Year: 2015-2016

Course Title: EEC4124 / Telecommunication networks

Course Contents	Course outcomes ILOs																			
	Knowledge and Understanding								Intellectual							Practical		Transferable		
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	C1	C2	D1	D2	D3
Classification of communicatio	X								X							X		X		
Transmission principles		X			X						X	X					X	X		
Transmission		X					X			X					X		X		X	
Transmission			X								X					X		X	X	
Switching				X				X				X					X			X
Signaling and call establishment			X						X					X		X				X
Numbering					X								X				X	X		X
Forecasting plan &					X		X			X			X			X			X	X
Charging plan					X					X			X		X		X	X	X	
Exchange systems, call establishment and call termination					X		X		X				X			X		X		X
Traffic	X		X								X					X	X	X	X	
Loss system						X										X		X	X	
Queuing theory		X		X				X				X			X		X	X		X
Overflow					X		X				X			X		X	X	X	X	

Course coordinator: ***Dr. Heba Ali El- Khobby*** Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Project**	
Course Code	**EEC4029**	
Academic Year	**2015-2016**	
Coordinator	**Associate Prof. Mahmoud Ahmed Attia Ali**	
Teaching Staff	**All Teaching staff**	
Branch / Level	**--/ Fourth Year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 1**	**14 x 1=14 h lectures**
	Practical /Tutorial 3	**14 x 3=42 h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Know the scientific methods of carrying out a complete survey
- Realize the previous subjects related to the project subject
- Recognize the packages suitable for accomplishing the project
- Deal with the results in a systematic manner.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. List the main procedures of carrying out a research in a certain field
A2. Mention the modern issues related to the topic of the project
A3. Outline the mathematical and practical bases of the subject of the project
A4. Classify the different approaches in the field of the project topic

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Comment on the different methods that can solve the problem under investigation
B2. Analyze the selected method of solving the problem under investigation
B3. Develop the suitable schedule for carrying out the task in the suitable sequence
B4. Give Recommendations depending on the obtained results

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Build up the investigated system in the correct form
C2. Measure the required variables correctly
C3. Confirm the theoretical results using the measured results

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self-confidence
D3.Manage time

3. Course Contents

Week	Topics
1,2,3,4	Survey
5,6	Data processing
7,8,9,10	Main professional and practical part
11,12	Conclusions and recommendations
13,14	Writing the project book

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	--	--	--
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:

Taken by student inside classroom.

Essential Books:

Depends on the subject

Web sites:

Cite during the course.

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	**Assoc. Prof. Mahmoud A. A. Ali**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. محمود أحمد عطية علي**	**د. محمود أحمد عطية علي**
Signature		
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 4029 / Project

Course Contents	Course outcomes ILOs													
	Knowledge and Understanding				Intellectual				Practical			Transferable		
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	D1	D2	D3
Survey	X						X					X		
Data processing		X						X		X		X	X	
Main professional and practical part			X		X		X		X					X
Conclusions and recommendations				X					X				X	
Writing the project book				X		X			X		X			X

Course coordinator: ***Assoc. Prof. Mahmoud A. A. Ali*** Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Project Management**	
Course Code	**EEC 41H5**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Ahmed El Qusas**	
Teaching Staff	**Dr. Ahmed El Qusas**	
Branch / Level	**--/ Fourth Year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 2**	**14 x 2=28 h lectures**
	Practical / Tutorial --	**14 x 0=0 h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Demonstrate knowledge used in project management planning and control.
- Define the project life cycle and project stages and their relations with product life cycle.
- Practice the processes of planning and controlling cycle.
- Define planning tools and techniques and solve problems.
- Analyze networks with deterministic time.
- Analyze networks with probabilistic time.
- Describe activity "crashing" and solve typical problems.
- Define earned value as an integrated planning and control tool.
- Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1.Define project and project management.
A2.Understand the role of good project manger
A3.Understand the project life cycle and the importance to focus more in the initial phases of the project.
A4.Understand the different steps in preparing a feasibility study.
A5.Understand planning and controlling techniques.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1.Analyze problems, conclude solutions, criticize actions and demonstrate creative thinking.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1.Apply planning tools and techniques for proper project planning.
C2.Use earned value technique for effective project control.
C3.Perform evaluation of a project document.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence

3. Course Contents

Week	Topics
1	Project and project management definition and characteristics.
2	Role of project manager.
3	Project life cycle key activities, milestone.
4	Level of effort during each phase of project life cycle Product.
5,6	Life cycle and its relation with project life cycle.
7	Level of effort and level of influence vs. cost changes.
8,9	Feasibility study.
10	Tradeoff between time and cost. Resource management.
11	Planning and control cycles.
12	Earned value technique.
13,14	Earned value graph and table.

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	2h	On week 16	80%
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:

Taken by the student inside classroom

Essential Books:

11. Bruke, Rory., Project Management: Planning and Control Techniques, Wiley,2001
12. Kerzner, Harold., Project Management: A Systematic Approach to Planning, Scheduling, and Controlling, Van Nostrand Reinhold, 2000

Web sites:

URL: http://www.learningtree.com/training-directory/Project-Management-Training-15.htm

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	Dr. Ahmed El Qusas	Assoc. Prof. Mahmoud A. A. Ali
Name (Arabic)	د.أحمد القصاص	د. محمود أحمد عطية علي
Signature		
Date	28/9/2015	28/9/2015

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC41H5 / Project Management

Course Contents	Course outcomes ILOs									
	Knowledge and Understanding					Intellectual	Practical			Tr
	A1	A2	A3	A4	A5	B1	C1	C2	C3	D
project management definition and cs	X					X				
ct manager			X		X	X		X		
ycle key activities, milestone				X						
rt during each phase of project life cycle Product			X		X		X		X	
d its relation with project life cycle				X		X		X		
rt and level of influence vs. cost changes		X			X	X		X		
udy			X						X	
ween time and cost. Resource management		X			X	X	X			
d control cycles				X				X		
e technique	X		X		X	X	X		X	
e graph and table		X		X				X		

Course coordinator: ***Dr. Ahmed El Qusas***
Assoc. Prof. Mahmoud A. A. Ali

Head of Department:

Course Specification

Course Title	**Data Security (elective course)**	
Course Code	**EEC 4126**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Intisar Saeed Gameeye**	
Teaching Staff	**Dr. Intisar Saeed Gameeye**	
Branch / Level	**--/ Fourth Year**	
Semester	**First**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical /Tutorial 2	**14 x 2=28 h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**28/9/2015**	

1. Course Aims

The aims of this course are to:

- Understand cryptography system
- Classify the encryption algorithms.
- Know the difference between symmetric and asymmetric encryption
- Understand the concepts of data integrity, confidentiality and authentication.
- Study how to apply the security concepts in computer networks.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Understand the mathematics basics needed in encryption algorithms such as modulusoperation and its properties.
A2. Describe the traditional ciphering techniques.
A3. Identify some of modern symmetric key encryption techniques.
A4. Identify some of asymmetric key encryption techniques.
A5. Define data integrity, confidentiality and authentication.
A6. Understand the concept of digital signature.
A7. Describe key management systems.
A8. Recognize some of network security protocols such as IPSec, SSL/TLS, and PGP.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Compare between symmetric and asymmetric encryption.
B2. Compare between traditional and modern ciphers.
B3. Analyze the hashing system and how it achieves the integrity
B4. Choose the suitable cipher considering the complexity and how much it guarantees thesystem security.
B5. Describe the implementation of security protocols in network system such as in virtualprivate networks (VPNs) and firewalls.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Create software functions to confirm the ciphers operation
C2. Build up software codes for hashing algorithms.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence

3. Course Contents

Week	Topics
1,2	Introduction to Cryptography Concepts and mathematics.
3,4,5	Symmetric Key Encryption (Traditional and Modern Techniques)
6,7,8	Asymmetric Key Encryption
9,10,11,12	Integrity (Hashing), Authentication, and Key Management
13,14	Network Security (IPSec, SSL/TLS, and PGP protocols…etc).

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Assignments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	70%
Oral Assessment	15-30minuite	On week 15	5%
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	25%

6. List of references

Course notes:

Taken by the student inside classroom

Essential Books:

1. "Information Security, Principles and Practice", Mark Stamp,2005
2. "Cryptography and Network Security", 4th Edition, Behrouz A. Forouzan,2007

Web sites:

http://www.tutorialspoint.com/data_communication_computer_network/
http://learnthat.com/introduction-to-network-security

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer Lab with simulation Packages such as MATLAB, OPNET Modeler, and NS2.

	Course Coordinator	Head of Department
Name	**Dr. Intisar Saeed Gameeye**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د.انتصار سعيد جميعي**	**د. محمود أحمد عطية علي**
Signature		
Date	**28/9/2015**	**28/9/2015**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 4126 / Data security

Course Contents	Course outcomes ILOs																
	Knowledge and Understanding								Intellectual					Practical		Transferable	
	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	C1	C2	D1	D2
Introduction to Cryptography	X											X				X	X
Symmetric Key Encryption	X	X	X						X	X		X		X		X	X
Asymmetric Key Encryption	X			X					X	X		X		X		X	X
Integrity (Hashing), Authentication, and	X				X	X	X				X	X			X	X	X
Network Security (IPSec, SSL/TLS,								X				X	X			X	X

Course coordinator: ***Dr. Intisar Saeed Gameeye*** Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***

Fourth Year
Second Term

Course Specification

Course Title	**Mobile Communication Systems**	
Course Code	**EEC4230**	
Academic Year	**2015-2016**	
Coordinator	**Associate Prof Salah Khamise**	
Teaching Staff	**Associate Prof Salah Khamise** **Dr. Mahmoud Mohamed Mahmoud Selim**	
Branch / Level	**--/ Fourth Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 4**	**14 x 4=56 h lectures**
	Practical / Tutorial 2	**14 x 2=28 h practical / tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss basic knowledge in the fields of personal and mobile communication engineering.
- Provide the definition, analysis, and solving of problems related to the personal and mobile communications: wave propagation, traffic management, wireless network planning.
- Acquire mobile communications network planning, management, maintenance anddevelopment
- Enable valuable information on numbering, identities, and performance benchmarks to help you planand design mobile systems and networks.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define the basic concepts of personal communication systems
A2. Illustrate multiple access
A3. Describe cell planning and frequency reuse
A4. Define diversity techniques
A5. Explain mobile Communication system: GSM, CDMA systems, 3G systems

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Evaluate the past, present, and future of mobile and personal communication systems.
B2. Suggest how the evolution toward next-generation systems will shape tomorrow's mobile communications industry
B3. Analyze clear understanding of the basic technology, architecture, and applicationsassociated with mobile communications.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Perform and control emissions from base stations
C2. Preserve with customers and suppliers.

C3. Confirm operation and maintenance of base stations and switching centers
C4. Diagnose Mobile communication sites

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence

3. Course Contents

Week	Topics
1	Cellular Systems
2	Propagation Modeling
3	Co-Channel Interference
4,5	Modulation and Power Spectral Densities
6,7	Digital Signaling on Flat Fading Channels
8,9	Digital Signaling on Fading ISI Channels
10	Code Division Multiple Access
11	Cellular Coverage Planning
12,13	Link Quality Measurement and Handoff Initiation
14	Channel Assignment Techniques

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion
- Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	15-30minuite	On week 15	10%
Practical Examination	15-30minuite	On week 15	10%
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:

Taken by the student inside classroom

Essential Books:

1. Saleh Faruque - Cellular Mobile Systems Engineering,2008
2. W.C. Y. Lee - Mobile Cellular Telecommunications,2005

3. Raymond Steele - Mobile Radio Communications ,2000

Web sites:

To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Lab.

	Course Coordinator	Head of Department
Name:	Associate Prof Salah Khamise	Associate Prof. Mahmoud A. A. Ali
Name (Arabic)	د. صلاح الدين خميس	د. محمود أحمد عطية علي
Signature:		
Date:	13/2/2016	13/2/2016

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 4230 / Mobile Communication Systems

Course Contents	Course outcomes ILOs												
	Knowledge and Understanding					Intellectual			Practical				Tra
	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D1
r Systems	X	X				X			X		X		X
tion Modeling		X	X				X	X		X		X	
nnel Interference				X			X		X				X
tion and Power Spectral Densities		X			X		X	X	X		X	X	X
Signaling on Flat Fading Channels			X		X		X			X			
Signaling on Fading ISI Channels	X		X			X		X		X	X	X	
ivision Multiple Access	X		X	X		X				X			X
Coverage Planning		X					X	X	X		X	X	X
ality Measurement and Handoff Initiation			X	X		X			X	X			
Assignment Techniques	X		X	X		X	X	X		X		X	X

Course coordinator: ***Associate Prof Salah Khamise*** Head of Department: ***Associate Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Computer Communication Networks**	
Course Code	**EEC 4231**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Sameh Atef Napoleon**	
Teaching Staff	**Dr. Sameh Atef Napoleon**	
Branch / Level	**--/ Fourth Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 2	**14 x 2=28 h practical /tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss classification of networks
- Discuss data link layer, network layer and transport layer
- Enhance LAN protocols for different IEEE 802 standards
- Discuss flow control and congestion control in TCP
- Assist connectionless internetworking
- Enable IP and routing protocols
- Discuss satellite networks

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define communication networks
A2. Describe physical layer
A3. Illustrate data link layer, network layer and transport layer
A4. Explain LAN protocols for different IEEE 802 standards
A5. Mention flow control and congestion control in TCP
A6. Trace connectionless internetworking and routing protocols
A7. Mention satellite networks and packet radio networks

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. compare communication networks
B2. Analyze physical layer, data link layer, network layer and transport layer.
B3. Evaluate LAN protocols for different IEEE 802 standards
B4. Compare flow control and congestion control in TCP
B5. Apply connectionless internetworking and Evaluate routing protocols
B6. Integrate satellite networks and packet radio networks

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Design knowledge for LAN layers and protocols
C2. Confirm basics for wireless networks

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence

3. Course Contents

Week	Topics
1	Classification of Communication Networks
2	Physical Layer
3	Analog and Digital Data Transmission,
4	Transmission Impairments
5,6	Bandwidth vs. Channel Capacity, Transmission Media
7,8	Data Encoding, Digital Data Communication Techniques
9	Asynchronous and Synchronous Transmission
10	Interfacing to Physical Layer
11	Data Link Layer , Network Layer ,Local Area Networks, protocols, and IEEE 802 standard & Transport Layer
12	Flow Control and Congestion Control in TCP ,Congestion Management
13	Internetworking & Connectionless Internetworking
14	The Internet Protocol, Routing Protocol, Satellite Networks &Packet Radio Networks

4. Teaching and Learning Methods

- Lectures
- Assignments
- General reading and discussion
- Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	60%
Oral Assessment	15-30minuite	On week 15	10%
Practical Examination	15-30minuite	On week 15	10%
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:

Taken by the student inside classroom

Essential Books:

1. Data Communication and Networking, 4th Edition, Behrouz Forouzan, 2007
2. Packet radio networks: architectures, protocols, technologies, and applications By Clifford A. Lynch,Edwin Blake Brownrigg,2005

Web sites:

http://williamstallings.com/DataComm
http://www.tutorialspoint.com/data_communication_computer_network/
http://www.comptechdoc.org/independent/networking/guide/

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer lab equipped with simulation programs: Matlab, OPNET Modeler, NS2, Cisco Packet Tracer.

	Course Coordinator	Head of Department
Name:	Dr. Sameh Atef Napoleon	Associate Prof. Mahmoud A. A. Ali
Name (Arabic)	د. سامح عاطف نابليون	د. محمود أحمد عطية علي
Signature:		
Date:	13/2/2016	13/2/2016

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 4231 / Computer communication networks

Course Contents	Course outcomes ILOs														
	Knowledge and Understanding							Intellectual						Practical	
	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	C1	C2
fication of Communication Networks	X							X							
al Layer		X							X					X	
g and Digital Data Transmission,			X						X					X	
nission Impairments				X						X				X	
idth vs. Channel Capacity, Transmission					X						X			X	
ncoding, Digital Data Communication ques						X						X		X	
hronous and Synchronous Transmission						X						X		X	
cing to Physical Layer							X						X		X
ink Layer , Network Layer ,Local Area rks, protocols, and IEEE 802 standard & ort Layer							X						X		X
Control and Congestion Control in TCP estion Management						X						X		X	
tworking & Connectionless tworking							X						X		X
ternet Protocol, Routing Protocol, Satellite rks &Packet Radio Networks							X						X		X

Course coordinator: ***Dr. Sameh Atef Napoleon Mahmoud A. A. Ali***

Head of Department: ***Associate Prof.***

Course Specification

Course Title	**Microwave Engineering**	
Course Code	**EEC4232**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Amr Hussein Hussien Abdallah**	
Teaching Staff	**Dr. Amr Hussein Hussien Abdallah**	
Branch / Level	**--/ Fourth Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 2	**14 x 2=28 h practical /tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Discuss of the conventional tubes and their problems at radio frequencies above 1 GHZ.
- Provide the basic principles of microwave amplifiers and oscillators.
- Assist the scattering parameters in designing the input and output matching networks.
- Enhance skills in using smith chart to design microwave amplifiers, and matching processes.
- Discuss of scattering parameters in designing multi-port networks

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Define the conventional tubes
A2. Describe the fundamental concepts of klystron amplifiers.
A3. Tell the principles of operation of traveling wave tubes.
A4. Say the principles of operation of magnetrons.
A5. Describe the principles of solid state devices.
A6. Draw using smith chart to design microwave amplifiers, and matching processes.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Evaluate the gain, and bandwidth of a particular amplifier.
B2. Analyze the conventional tubes
B3. Measure the microwave amplifiers using smith chart.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply the operation of the klystron amplifiers.
C2. Diagnose between the traveling wave tubes.

C3. Design the microwave amplifiers using scattering parameters.
C4. Perform with the solid state devices.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self confidence
D3. Manage time
D4. Work under pressure

3. Course Contents

Week	Topics
1	Introduction to the course, and the conventional tubes (CT)
2,3	Double cavity klystron (DCK)
4	Reflex klystron (RK)
5,6	Travelling wave tubes (TWT)
7,8	Solid state devices (tunnel diode)
9	Midterm exam
10,11	Scattering parameters
12,13	Design of microwave amplifiers for maximum gain using scattering parameters with the aid of smith chart
14	Course Revision

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion
- Experiments

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	2h	On week 16	60%
Oral Assessment	15-30minuite	On week 15	١0%
Practical Examination	15-30minuite	On week 15	١٠%
Semester work	5 hours (overall)	On week 3,5,6,9,12	20%

6. List of references

Course notes:
Taken by the student inside classroom

Essential Books:

1. Robert Collin, Foundation for Microwave Engineering, McGraw Hill, Inc, 2nd ed., 2001.
2. David M. Pozar, Microwave Engineering, 3rd ed., Wiley, 2005.
3. Samuel Y. LiAO, Microwave Devices and Circuits, 3rd ed., Prentice Hall.
4. Walker, John L. B.," Handbook of RF and Microwave Power Amplifiers", December 2011.

Web sites:

To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	**Dr. Amr Hussein Abdallah**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. عمرو حسين حسين عبد الله**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 4232 / Microwave Engineering

Course Contents	Course outcomes ILOs																
	Knowledge and Understanding						Intellectual			Practical				Transferable			
	A1	A2	A3	A4	A5	A6	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	D4
Conventional tubes	X							X						X		X	X
Double cavity Klystron		X					X			X		X				X	
Reflex Klystron amplifier			X				X			X		X			X	X	
Traveling wave tubes				X			X			X	X	X			X	X	
Magnetron					X		X					X				X	
Scattering parameters						X	X		X			X				X	
Solid state devices						X			X			X	X	X		X	

Course coordinator: ***Dr. Amr Hussein Hussien Abdallah*** Head of Department:
Assoc. Prof. Mahmoud A. A. Al

Course Specification

Course Title	**Advanced Communication Systems (Elective Course)**	
Course Code	**EEC 4236**	
Academic Year	**2015-2016**	
Coordinator	**Assoc. Prof. Mahmoud Ahmed Attia Ali**	
Teaching Staff	**Assoc. Prof. Mahmoud Ahmed Attia Ali**	
Branch / Level	**--/ Fourth Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3 = 42 h lectures**
	Practical / Tutorial 2	**14 x 2 = 28 h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Enable basic knowledge in the fields of spread spectrum SS, orthogonal frequency division multiplexing OFDM, and frequency comb multiple access FCMA techniques.
- Recognize various SS synchronization procedures including acquisition and tracking.
- Discuss and analyze SS multiple access and anti-jamming applications.
- Define the application of ranging and navigation with SS.
- Recognize the properties of FCMA and its mathematical and simulation model.
- Analyze false signature generation and phase cancelation in FCMA techniques.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Discover the mathematical analysis of PN code sequence's and jamming game in spread spectrum systems, and false signatures statistical analysis in FCMA systems.
A2. Explain the concepts of jamming, ranging, acquisition, tracking criterion, in addition to the operation concepts of DSSS, FHSS, TDMA, OFDM, and FCMA systems.
A3. Recognize the principles of design and block diagrams of DS and FH in multiple access applications including noise and interference.
A4. The efficient use of PN codes to spread co-channel interference.
A5. Recognize the design standards for good PN code in SS, suitable prefix time in OFDM, and strategies of signatures selection in FCMA.
A6. Explain various synchronization for DS and FH spread spectrum techniques including both serial and parallel modes.
A10. Explain the basics of design and analysis of DS, FH, FCMA, and OFDM in interference environment.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Using DFT and FFT for OFDM high rate transmission and statistical analysis for FCMA.

B2. Select the appropriate strategy of signatures generation and appropriate ranging strategy.
B5. Compare and evaluate the performance of SS, FCMA, and OFDM systems.
B7. Suggest the appropriate dimensions for Mary FCMA based on the data rate and complexity.
B8. Select the appropriate dimension of Mary FCMA considering the efficient use of resources with highest data rate.
B12. Analyze the performance of FHMA, OFDM, and M-ary FCMA.
B13. Efficient Incorporation of DFT and IDFT together with prefix time to achieve high rate and low inter-symbol interference in OFDM systems.
B16. Optimum design of SS, M-ary FCMA, and OFDM.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Apply the concepts of DFT and FFT and prefix time notion to eliminate ISI, good PN codes to reject interference, and good acquisition technique for synchronization.
C11. Construct simplified simulation model to design and investigate the performance of M-ary FCMA systems including noise and co-channel Interference.
C12. Draw and comment for the simulation analysis of the upper-bound relation.

D. General and transferable skills:

By the end of this course, the students should be able to:

D2. Work in stressful environment and within constraints.
D4. Build self confidence
D5. Manage time.
D6. Use general basics for self and continuous learning.

3.

Week	Topics
1, 2, 3	Applications of Spread Spectrum SS in Multiple Access, Jamming Environment, Ranging, and Navigation.
4, 5, 6	Synchronization of Spread Spectrum DS and FH Systems including both Acquisition and Tracking Techniques.
7, 8, 9	Architecture and Operation of Orthogonal Frequency Division Multiplexing, OFDM, Advantages, Drawbacks, and Including Prefix Time to Minimize Inter Symbol Interference ISI.
10,11,12	Definition of FCMA Systems, Block Diagram, Main feature, Simple Accessing, Strategies of signatures selection, Simulation Model, Upper-bound Relation, Statistical Analysis of False Signature Generation “FSG” and Phase Cancelation.
13,14	Demodulation of FCMA signal, Mathematical Analysis of both Envelope Detector and Quadrature Receiver. Maximum Likelihood Concepts.

Course Contents

4. Teaching and Learning Methods

4.1- Lectures.
4.2- Problems solving.
4.3- Web-sites show and demonstration.
4.4- General reading and discussion.
4.5- Research skills development.
4.6- Direct reading and independent studies.

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	٦٦.66 %
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	٣٣.33 %

6. List of references

Course notes:

Taken by the student inside classroom

Essential Books:

1. Xiaodong Wang and H. Vincent Poor, "Wireless Communication Systems: Advanced Techniques for Signal Reception", 2007.
2. John Zulzman, "MIMO-OFDM Wireless Communications with MATLAB" Wiley-IEEE Press, 2010.
3. Don Torrieri, "Principles of Spread-Spectrum Communication Systems, Springer, 2011.
4. Richard A. Poisel, "Modern Communications Jamming Principles and Techniques", 2ed Edition, 2011.

Web sites:

To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- White board and erasable markers.

	Course Coordinator	Head of Department
Name	Assoc. Prof. Mahmoud A. A. Ali	Assoc. Prof. Mahmoud A. A. Ali

Name (Arabic)	د. محمود أحمد عطية علي	د. محمود أحمد عطية علي
Signature		
Date	13/2/2016	13/2/2016

5.5 Course contents – Course ILOs Matrix

Course Code / Course Title: EEC 4236 / Advanced Communication Systems
Academic Year 2015-2016

Course Contents	Course outcomes ILOs																				
	Knowledge and Understanding							Intellectual								Practical			Transferable			
Number	A1	A2	A3	A4	A5	A6	A10	B1	B2	B5	B7	B8	B12	B13	B16	C1	C11	C12	D2	D4	D5	D6
Applications of Spread Spectrum SS in Multiple Access Applications of Spread Spectrum SS in Multiple Access, Jamming Environment, Ranging, and Navigation.	X	X	X	X	X		X		X	X			X		X	X			X	X	X	X
Synchronization of Spread Spectrum, DS and FH Systems including both Acquisition and Tracking Techniques..		X				X	X						X		X	X			X	X		X
Architecture and Operation of Orthogonal Frequency Division Multiplexing, OFDM, Advantages, Drawbacks, and Including Prefix Time to Minimize Inter Symbol Interference ISI.	X	X			X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Definition of FCMA Systems, Block Diagram, Main feature, Simple Accessing, Strategies of signatures selection, Simulation Model, Upper-bound Relation, Statistical Analysis of False Signature Generation “FSG” and Phase Cancelation.	X	X			X		X	X	X	X	X	X	X		X		X	X	X	X		X
Definition and Modeling of Frequency Comb Multiple Access, FCMA Demodulation of FCMA signal, Mathematical Analysis of both Envelope Detector and Quadrature Receiver. Maximum Likelihood Concepts.	X	X			X		X	X	X	X	X	X	X		X		X	X	X	X		X

Course coordinator: ***Assoc. Prof. Mahmoud A. A. Ali*** **Head of Department:** ***Assoc. Prof. Mahmoud A. A. Ali***

Course Specification

Course Title	**Information theory**	
Course Code	**EEC4237**	
Academic Year	**2015-2016**	
Coordinator	**Dr. Heba Ali El-Khobby**	
Teaching Staff	**Dr. Heba Ali El-Khobby**	
Branch / Level	**--/ Fourth Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture 3**	**14 x 3=42 h lectures**
	Practical / Tutorial 2	**14 x 2=28 h practical / tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Study Entropy and Mutual Information Theory , Joint Entropy, Conditional Entropy
- Be familiar Source Coding and the AEP - Joint Typicality (Neuhoff/Forney notes) - Entropy Rate - Conditional Independence and Markov Chains - Entropy Rate
- Be familiar Discrete Memory less Channels and Their Capacity - Arimoto-Blahut Algorithm – Proof of the Channel Coding Theorem -Converse of Channel Coding Theorem.
- Study Capacity of AWGN, Bandlimited AWGN Channels - Capacity of Nonwhite Channels: Water Filling

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. Describe Mutual Information Theory, Joint Entropy, And Conditional Entropy.
A2. Describe behavior of Source Coding and the AEP - Joint Typicality (Neuhoff/Forney notes) - Entropy Rate - Conditional Independence and Markov Chains - Entropy Rate
A3. Give example of usage of Information Theory, Coding, and Cryptography.

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Distinguish between Mutual Information Theory, Joint Entropy, And Conditional Entropy.
B2. Analyze behavior Source Coding and the AEP - Joint Typicality.
B3. Analyze Capacity of AWGN, Bandlimited AWGN Channels - Capacity of Nonwhite Channels: Water Filling.

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Build up Design of Source Coding and the AEP - Joint Typicality
C2. Construct of between Mutual Information Theory, Joint Entropy, Conditional Entropy.

D. General and transferable skills:

By the end of this course, the students should be able to:

D1.Work in teamwork
D2.Cooperate to collect information about certain topics.
D3.Report a main subject through defined groups.
D4. Build self-confidence.

3. Course Contents

Week	Topics
1	Information Measure
2	Discrete Memory less Source,
3	Entropy Function, Maximalist of Entropy Function,
4,5,6,7	Markov Sources, Channel Capacity,
8,9,10,11	Continuous Channels, Shannon's Theory, Source Coding, Efficiency in Coding, Optimum Coding,
12,13,14	Error Detection and Correction Codes: Block Codes, Cyclic Codes, Sequential Codes.

4. Teaching and Learning Methods

- Lectures
- Assignments
- General reading and discussion
- Problems solving
- Web-sites show and demonstration

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	3h	On week 16	68%
Oral Assessment	--	--	--
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	32%

6. List of references

Course notes: *Notes provided by the lecturer*
Essential Books:

1. Principles of Communication Systems Simulation with Wireless Applications, 2007
2. Elements of information theory, T. M. Cover, J. A. Thomas, 2005
3. Digital Communications , Fundamentals and Applications, Bernard S.,

Web sites:
To be cited during the course

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Overhead Projector

	Course Coordinator	Head of Department
Name:	Dr. Heba Ali El Khobby	Associate Prof. Mahmoud A. A. Ali
Name (Arabic)	د. هبه علي الخبى	د. محمود أحمد عطية علي
Signature:		
Date:	13/2/2016	13/2/2016

5.5 Course contents – Course ILOs Matrix **Academic Year: 2015-2016**

Course Code / Course Title: EEC 4237 / Information Theory

Course Contents	Course outcomes ILOs									
	Knowledge and Understanding			Intellectual			Practical		Transfer	
	A1	A2	A3	B1	B2	B3	C1	C2	D1	
tion Measure	X			X				X	X	
Memory less Source,		X			X		X			
Function, Maximalist of Entropy n,	X		X	X		X	X	X	X	
Sources, Channel Capacity,		X		X	X		X		X	
ous Channels, Shannon's Theory, Source Efficiency in Coding, Optimum Coding,		X			X			X		
etection and Correction Codes: Block Cyclic Codes, Sequential Codes.			X			X		X		

Course coordinator: ***Dr. Heba Ali El-Khobby***
Associate Prof. Mahmoud A. A. Ali

Head of Department:

Course Specification

Course Title	**Project**	
Course Code	**EEC4029**	
Academic Year	**2015-2016**	
Coordinator	**Associate Prof. Mahmoud A. A. Ali**	
Teaching Staff	**All teaching staff**	
Branch / Level	**--/ Fourth Year**	
Semester	**Second**	
Pre-Requisite	**--**	
Course Delivery	**Lecture ٠**	**14 x ٠=٠ h lectures**
	Practical /Tutorial ٤	**14 x ٤=٥٦ h practical/tutorial**
Parent Department	**Electronics and Electrical Communication Engineering**	
Date of Approval	**13/2/2016**	

1. Course Aims

The aims of this course are to:

- Know the scientific methods of carrying out a complete survey
- Realize the previous subjects related to the project subject
- Recognize the packages suitable for accomplishing the project
- Deal with the results in a systematic manner.

2. Intended Learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this course students should be able to:

A1. List the main procedures of carrying out a research in a certain field
A2. Mention the modern issues related to the topic of the project
A3. Outline the mathematical and practical bases of the subject of the project
A4. Classify the different approaches in the field of the project topic

B. Intellectual skills:

By the end of this course, the students should be able to:

B1. Comment on the different methods that can solve the problem under investigation
B2. Analyze the selected method of solving the problem under investigation
B3. Develop the suitable schedule for carrying out the task in the suitable sequence
B4. Give Recommendations depending on the obtained results

C. Professional and practical skills:

By the end of this course, the students should be able to:

C1. Build up the investigated system in the correct form
C2. Measure the required variables correctly
C3. Confirm the theoretical results using the measured results

D. General and transferable skills:

By the end of this course, the students should be able to:

D1. Work in teamwork
D2. Build self-confidence
D3. Manage time

3. Course Contents

Week	Topics
1,2,3,4	Survey
5,6	Data processing
7,8,9,10	Main professional and practical part
11,12	Conclusions and recommendations
13,14	Writing the project book

4. Teaching and Learning Methods

- Lectures
- Problems solving
- Web-sites show and demonstration
- General reading and discussion

5. Student Assessment

Assessment Method	Assessment Length	Schedule	Proportion
Written Examination	--	--	--
Oral Assessment	2 hours	After written exam	50%
Practical Examination	--	--	--
Semester work	5 hours (overall)	On week 3,5,6,9,12	30%

6. List of references

Course notes:

Taken by student inside classroom.

Essential Books:

Depends on the subject

Web sites:

Cite during the course.

7. Facilities required for teaching and learning

- PC, data show and portable display screen.
- Computer Lab with simulation Packages such as MATLAB, Multisim, and ISE Xilinc.

	Course Coordinator	Head of Department
Name	**Assoc. Prof. Mahmoud A. A. Ali**	**Assoc. Prof. Mahmoud A. A. Ali**
Name (Arabic)	**د. محمود أحمد عطية علي**	**د. محمود أحمد عطية علي**
Signature		
Date	**13/2/2016**	**13/2/2016**

5.5 Course contents – Course ILOs Matrix

Academic Year Second: 2015-2016

Course Code / Course Title: EEC 4029 / Project

Course Contents	Course outcomes ILOs													
	Knowledge and Understanding				Intellectual				Practical			Transferable		
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	D1	D2	D3
Survey	X						X					X		
Data processing		X						X		X		X	X	
Main professional and practical part			X		X		X		X					X
Conclusions and recommendations				X					X				X	
Writing the project book				X		X			X		X			X

Course coordinator: ***Assoc. Prof. Mahmoud A. A. Ali*** Head of Department: ***Assoc. Prof. Mahmoud A. A. Ali***