Electronic Engineering and Communication Technology BSc Program Specifications

(By-Law 2012)

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مقدمة

الهندسة هى المعرفة بالعلوم الطبيعية والرياضية، والتى تكتسب بالدراسة والخبرة والممارسة، وتطبق بوعى لتطوير أساليب تستخدم اقتصاديا لتطويع المواد وقوى الطبيعة لصالح البشريّة. وهى أيضا المقدرة على الشروعفي النشاط والسلوك المرتبط بالعمليات الهندسية والنظم والمشاكل والفرص، والتاريخ ، والمستقبل ، والتأثيرات ، والأخلاق والمردودات. كما أنهاتنطوى على المعرفة، وطرق التفكير والتصرفات والقدرات. كما تساعد في إعداد الأفراد لتقديم خيارات مدروسة في إطار كونهم مستهلكين أوعمالاأومواطنين وأعضاء فى المجتمع الدولى.وينبغي أن يحقق التعليم الهندسي التميز والتفوق في التعليم العالى والدراسات العليا والبحوث، والخدمة العامة، وتطوير المعارف الهندسية. وهو يهدف الى تخريج مهندسين موهوبين، واسعى المعرفة على درجة عالية من الكفاءة، بالإضافة إلى إنتاج بحوث وتقنيات مفيدة وخلاقة من خلال التفوق والتميز الأكاديمي. علاوة على ذلك فإن التعليم الهندسى يهدف إلى تحفيز الطلاب وأعضاء هيئة التدريس على التعلم والنمو، كذلك تحقيق وتلبية احتياجات المجتمع قوميًّا وإقليميًّا ودوليًّا. كما يهدف أيضا إلى إعداد الطّلبة لمهنة منتجة ومفيدة في المجال الهندسى مبنية على أسس حديثة، بما فيها اللحاق بعلوم الفضاء والاتصالات الرقمية والنانو، تتممها أخلاقيات معنوية قوية.

ويختص المهندسون بحل المشاكل الواقعيّة، ويعملون على إيجاد أفضل الحلول لهاعن طريق تطبيق مجمل معارفهم وخبراتهومومهاراتهم .ويساعد المهندسون على تعريف وتحسين نمط الحياة بتوفير وسائل حياتية ذات أداء عالي مبتكر، أكثر أمانًا وملائمة للاستعمال اليومى. كما يسعون إلى التطوير من خلال الاختراع والتصميموالتصنيع والبناء.كما تهدف مجمل الأنشطة الهندسية إلى الحصول على نتائج إيجابية لتحسين المعيشة بيد ان هناك عوائق تصاحبهذه الأنشطةمثل تلوث المياه والهواء والبيئة والتلوث الصوتي الناتج عن الإنجازات الهندسية المبهرة خلال العقود الماضية.كذلك يصطدم عمل المهندس أثناء مواجهة المشكلات بقيود متنامية نتيجة تشابك وتقارب المشكلات الاجتماعية والتقنية. وعلى سبيل المثال فإن مشكلة تلوّث الهواء لا يمكن أن تُحَلّ بدون اعتبار التناقضات الأخلاقيّة والسّياسيّة والقانونيّة والاجتماعيّة.علاوة على ذلك، يجب أن يأخذ فى الاعتبار تأثير الحلول الهندسية المتاحة على مصالح الأفراد و المجموعات.

وتقدم دراسة الهندسة للطلاب تعليما فعالا ومبنيا على أسس تكنولوجية،آخذا فى الاعتبار التوقعات المستقبلية للعلم والتكنولوجيا. وهى أيضا توفر المعارف التقنية والمهارات الضرورية لحل المشاكل التي تسمح بمواجهة التحديات المستقبلية . وقد حددتالمعايير الأكاديمية المرجعية (ARS)، لبرنامج هندسة الإلكترونيات وتكنولوجيا الاتصالات والمعتمدة من الهيئة القومية للاعتماد وجودة التعليم، الطبعة الأولى يوليو ٢٠١٥، مفاهيما شاملة تمثلا لتوقعات والطموحات العامة بخصوص معايير درجةالبكالوريوس في العلوم الهندسية، كما توضح هذه المفاهيم المواصفات والخصائص التى يتمتع بها خريج البرامج الدراسية الهندسية خاصة:

- منح الدرجة يتفق مع الإطار العام للتعليم الهندسى الحديث.
- الدرجات الهندسية تتوافق مع التوجهات القومية.
- الدرجات الممنوحة تلبى الاحتياجات الفعلية لسوق العمل.

وقد تم تصميم برنامج هندسة الإلكترونيات وتكنولوجيا الإتصالات لإعداد المهندسين المتميزين فى مجالات التصميم الإلكترونى وتكنولوجيا الإتصالات، إضافة إلى هندسة الطاقة الخضراء التى تدرس من خلال مجموعة من إستخدامات الطاقة الشمسية المتميزة والتى تعطى لخريج البرنامج تأهيلا لسد احتياجات سوق العمل.

وقد تم إعداد مواصفات البرنامج بتعاون جاد وأداء احترافى لنخبة متميزة من أعضاء هيئة التدريس المتخصصين فى مجالات مقررات البرنامج.

وقسم هندسة الإلكترونيات وتكنولوجيا الإتصالات إذ يقدم هذه الوثيقة الهامة فإنه يتقدم بالشكر لجميع أعضاء هيئة التدريس الذين تضافرت جهودهم لإنجازها كما يقدم الشكر والتقدير لمكتب الجودة بالأكاديمية الذى وفر الخبرات اللازمة والتدريب والاستشارات لإتمام مواصفات البرنامج.

والله ولى التوفيق،،،

د. مختار عبد الحليم
منسق البرنامج

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Content

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Electronic Engineering and Communication Technology BSc Program Specifications

1. General

1.1 Basic Information

Program Title: Electronic Engineering and Communication Technology BSc program
Program Type: Single
Department: Electrical Engineering Department
Coordinator: Dr. Mokhtar Mahmoud Abd El Haleem.
Assistant Coordinator: Dr.Hany Tawfik Kamel
Dr.Nelly Muhammad Hussein Shafik
External Evaluators: Prof. Mohammed. Abo Zahhad Abo Zaid, Vice Dean for Postgraduate Studies and Research Faculty of Engineering-Assiut University
Academic Standard: The program adopts the Academic Reference Standards (ARS) for Electronic Engineering and Communication Technology BSc program, approved by the National Authority for Quality Assurance and Accreditation in Education, first edition, July 2015.
Program Started on: 2001-2002
Dates of program specifications approval: August 2015

1.2. Staff Members

The Electronic Engineering and Communication Technology B.Sc. Program is taught 29 highly qualified staff members, 26 of them are full time employed and 3 are part time staff members in the Electrical Engineering department, in addition to 21 full time employed staff members teaching the basic science courses. All of the staff members are qualified to teach the courses allocated to them. The staff members are assisted by 65 full time teaching assistants in addition to 19 engineers and 18 technicians.

1.3. External Evaluator(s)

The program was evaluated internally and by an external reviewer. The report of external reviewer showed that the program specification agrees with Academic Reference Standards (ARS) for Electronic Engineering and Communication Technology BSc program, approved by the National Authority for Quality Assurance and Accreditation in Education, first edition, July 2015.

2. Professional Information

2.1. Preamble

Engineers solve real-life problems. They find the best solutions through the application of their knowledge, experience, and skills. Engineers help to define and refine the way of life by providing innovative, higher-performance, safer, cleaner or more comfortable day-use facilities for human beings. They seek improvement through the processes of invention, design, manufacturing, and construction.

The engineering study provides the students with the advanced, effective, technology-based education justifying the expectations of the future of science and technology. It should also provide the technical understanding and problem-solving skills which allow coping with the challenges of tomorrow.

Electronics becomes more and more influential on the human society. The reason for this is that almost all electronic products are produced in huge quantities so interfering with every one's life. In addition, electronic subsystems become part of almost any industrial product nowadays. Beside the basic laws of physical sciences, mathematics, and basic engineering sciences, electronics engineering programs combine electronic engineering principles and traditional computer science with good practice in design and project management applied to technically demanding problems. Graduates will be well qualified to play a disciplined and innovative part in research and development across the IT and Electronics sector.

An electronics engineer should have strong background in basic sciences and basic mathematics and be able to use these tools in their own engineering field. He should employ necessary techniques, hardware, and communication tools for modern engineering applications. He also should be able to work in a multi-disciplinary environment, and follow and contribute to the developments in their own field recognizing the significance of lifelong learning.

2.2. Program Mission and Aims

2.2.1. Program mission

The mission of the Bachelor of Science in Electronic Engineering and Communication Technology program is to prepare innovative graduates able to interact with the challenges in diverse domains of his specialty, locally and regionally. He should satisfy the requirements of the society in governmental authorities and public and private sectors.

2.2.2. Program Aim

The Electronic Engineering and communication Technology program aims at providing future engineers with appropriate theoretical knowledge and technical skills to respond to professional market demands.

2.2.3. The aimed graduate attributes

By the end of the study, the graduates of Electronic Engineering and Communication Technology BSc Engineering program should be able to:

1. Apply knowledge of mathematics, science, and engineering concepts to the solution of engineering problems.
2. Design a system; component and process to meet the required needs within realistic constraints.
3. Design and conduct experiments as well as analyze and interpret data.
4. Identify, formulate, and solve fundamental engineering problems.
5. Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
6. Work effectively within multi-disciplinary teams.

7. Communicate effectively.
8. Consider the impacts of engineering solutions on society and environment.
9. Demonstrate knowledge of contemporary engineering issues.
10. Display professional and ethical responsibilities; and contextual understanding.
11. Engage in self- and life- long learning.
12. Participate in and lead quality improvement projects.
13. Manipulate with the electronic circuits, all the way from the discrete components level, circuits' analysis and design, to the troubleshooting with emphasis on electronic power devices.
14. Apply control theory and measurement principals for industrial variables, signal conversion, conditioning and processing.
15. Deal with the computer's hardware, software, operating systems and interfacing.
16. Design, operate and maintain digital and analog communication, mobile communication, coding, and decoding systems.
17. Adapt to new telecommunication technologies.
18. Analyze, design, and implement telecommunication systems.
19. Deal with high frequency techniques.
20. Analyze and solve problems in antennas, wave propagation, microwave circuits, radars, and Satellites.
21. Planning and analyzing communication networks.

2.2.4. Graduate Career Opportunities

A B.Sc. degree in Electronics and Telecommunications Engineering Technology is designed for students who seek careers as engineers in industry, army, consulting firms and private and governmental agencies. This degree is also appropriate for students who plan to be researchers or who intend to pursue an advanced degree in engineering. A typical program curriculum incorporates analytical tools, creative thought and diversity of skills as well as the state of art of the profession.

The mission of the Bachelor of Science in Electronics and Telecommunications engineering technology program is to prepare innovative graduates able to interact with the challenges in diverse domains of his specialty, locally and regionally. He should satisfy the requirements of the society in governmental authorities and public and private sectors.

The electronics and Telecommunications technology program aims at providing future engineers with appropriate theoretical knowledge and technical skills to respond to professional market demands in the fields of **electronics and telecommunications engineering technology.**

2.3. Intended Learning Outcomes (ILO's)

The academic reference standards represent the general expectations about the qualifications, attributes and capabilities that graduates of the engineering programs should be able to demonstrate.

2.3.1 Knowledge and Understanding:

By the end of the study, the graduates of Electronic Engineering and Communication Technology BSc Engineering program should demonstrate the knowledge and understanding of:

A1. Concepts and theories of mathematics and sciences, appropriate to the discipline.
A2. Basics of information and communication technology (ICT).
A3. Characteristics of engineering materials related to the discipline.
A4. Principles of design including elements design, process and/or a system related to specific disciplines.
A5. Methodologies of solving engineering problems, data collection and interpretation.
A6. Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
A7. Business and management principles relevant to engineering.
A8. Current engineering technologies as related to disciplines.
A9. Topics related to humanitarian interests and moral issues.
A10. Technical language and report writing.
A11. Professional ethics and impacts of engineering solutions on society and environment.
A12. Contemporary engineering topics.
A13. Elementary science underlying electronic engineering systems and information technology;
A13. Basics of design and analyzing electronic engineering systems, while considering the constraints of applying inappropriate technology and the needs of commercial risk evaluation;
A15. Principles of Analyzing and design of electronic circuits and components;
A16. Principles of Analyzing and design of control systems with performance evaluation;
A17. Biomedical instrumentation;
A18. Communication systems
A19. Coding and decoding techniques
A20. Microwave applications
A21. Antenna and wave propagation
A22. Usage of optical fiber
A23. Methods of fabrication of Integrated circuits
A24. Analysis of signal processing
A25. Optical communication systems
A26. Satellite communications.
A27. Wireless communication techniques.
A28. One way and two ways communication systems.
A29. Broadcasting, acoustic engineering, and television engineering.

2.3.2 Intellectual Skills

By the end of the study, the graduates of Electronic Engineering and Communication Technology BSc Engineering program should be able to:

B1. Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
B2. Select appropriate solutions for engineering problems based on analytical thinking.
B3. Think in a creative and innovative way in problem solving and design.
B4. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
B5. Assess and evaluate the characteristics and performance of components, systems and processes.
B6. Investigate the failure of components, systems, and processes.
B7. Solve engineering problems, often on the basis of limited and possibly contradicting information.
B8. Select and appraise appropriate ICT tools to a variety of engineering problems.
B9. Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
B10. Incorporate economic, societal, environmental dimensions and risk management in design.
B11. Analyze results of numerical models and assess their limitations.
B12. Create systematic and methodic approaches when dealing with new and advancing technology.
B13. Develop innovative solutions for the practical industrial problems.
B14. Plan, conduct and write a report on a project or assignment.
B15. Analyze the performance of digital and analog communication, mobile communication, coding, and decoding systems.
B16. Synthesize and integrate electronic systems for certain specific function using the right equipment.
B17. Select appropriate technical methods to solve communication problems.
B18. Analyze different parameters of digital communication systems.
B19. Select optimum frequencies of digital and analog communication systems.

2.3.3 Practical and Professional Skills

By the end of the study, the graduates of Electronic Engineering and Communication Technology BSc Engineering program should be able to:

C1. Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.
C2. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.
C3. Create and/or re-design a process, component or system, and carry out specialized engineering designs.
C4. Practice the neatness and aesthetics in design and approach.
C5. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
C6. Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
C7. Apply numerical modeling methods to engineering problems.
C8. Apply safe systems at work and observe the appropriate steps to manage risks.
C9. Demonstrate basic organizational and project management skills.

C10. Apply quality assurance procedures and follow codes and standards.
C11. Exchange knowledge and skills with engineering community and industry.
C12. Prepare and present technical reports.
C13. Use appropriate mathematical methods or IT tools.
C14. Practice computer programming for the design and diagnostics of digital and analog communication, mobile communication, coding, and decoding systems.
C15. Use relevant laboratory equipment and analyze the results correctly.
C16. Troubleshoot, maintain and repair almost all types of electronic systems using the standard tools.
C17. Identify appropriate specifications for required devices.
C18. Use appropriate tools to measure system performance.
C18. Use appropriate devices to measure different parameters of communication systems.
C20. Use laboratory equipment to design and implement high frequency measurements.
C21. Troubleshoot, maintain, and repair different types of communication systems.

2.3.4 General and Transferable Skills

By the end of the study, the graduates of Electronic Engineering and Communication Technology BSc Engineering program should be able to:

D1 Collaborate effectively within multidisciplinary team.
D2 Work in stressful environment and within constraints.
D3 Communicate effectively.
D4 Demonstrate efficient IT capabilities.
D5 Lead and motivate individuals.
D6 Effectively manage tasks, time, and resources.
D7 Search for information and engage in life-long self-learning discipline.
D8 Acquire entrepreneurial skills.
D9 Refer to relevant literatures.

2.4. Curriculum Structure and Content

The program includes 65 courses of total 180 credit hours. These courses are classified according to the relevant sector NARS requirements to the following subject areas:

1) Humanities and social science
2) Mathematics and basic sciences
3) Basic engineering
4) Applied engineering and design
5) Computer Applications and ICT
6) Projects & training
7) Discretionary

2.4.1. Humanities and social science courses

a) Acquiring knowledge of non-engineering fields that strengthen the consciousness of the engineer of the society and its culture, including business, marketing, wellness, ethics, law, arts, etc.

b) The ability to consider and evaluate the impact of the technology on the society, public health and safety.
c) The ability to appreciate and engage in social and entrepreneurial activities essential to the engineering practice and reflect on the management of the economics and social science
d) The ability to engage in life-long learning and respond effectively to the needs of the society.

Table 1-a Core Human Sciences Courses (12Compulsory credit Hours).

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
GEN141	Contemporary Social Issues	2	2	-	-	Non	2						
GEN142	English Language.	2	2	-	-	Non	2						
GEN143	History of science and Technology.	2	2	-	-	Non	2						
GEN241	Presentation Skills.	2	2	-	-	Non	2						
GEN242	Technical Report Writing.	2	2	-	-	Non	2						
GEN341	Project Management.	2	2	-	-	Non	2						
Total		**12**					**12**						

Table 1-b Elective Human Sciences Courses (4 Credits Elected).

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
GEN 351	Engineering Economy.	2	2	-	-	None	4						
GEN 352	Engineering Laws and Regulations.	2	2	-	-	None							
GEN 353	Management, International Business and Total Quality Management.	2	2	-	-	None							
GEN 354	Sound Systems and Noise Pollution.	2	2	-	-	None							
GEN 355	Standard Calibers for Communications and Information.	2	2	-	-	None							

GEN 451	Computer Systems Implementation.	2	2	-	-	At least 140 credit hr								
GEN 452	Environmental Effects of Electromagnetic Waves.	2	2	-	-	None								
GEN 453	Industrial Psychology.	2	2	-	-	None								
GEN 454	Basics of Engineering Syndicate Works	2	2	-	-	None								
Total		**4***		-	-		4							

*The human courses make a percentage of 8.89% of the total credit sum.

2.4.2. Mathematics and Basic Sciences

Mathematics

Mathematical Courses give the following knowledge and understanding and skills:

a) Acquiring knowledge in mathematical and analytical methods.
b) The ability to reason about and conceptualize engineering components, systems or processes using analytical methods as related to the Manufacturing Engineering and Production Technology.
c) The ability to analyze and model engineering components, systems and processes specific to the Manufacturing Engineering and Production Technology.
d) The skill of using probability and statistical methods

Basic Sciences

Basic sciences Courses give the following knowledge and understanding and skills:

a) Acquiring knowledge of physics, chemistry, mechanics, earth sciences, biological sciences and other specific Courses which focus on understanding the physical world.
b) The ability to select and apply scientific principles in practical problem solving.
c) The ability to analyze, model and reason about engineering components, systems or processes using principles and knowledge of the basic sciences as applicable in each engineering disciplinary context.
d) The ability to adopt scientific evidence-based techniques in problems solving

Table -2-Mathematics & Basic Science Subjects (36 Compulsory Credit Hours)

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
CHE 100	Chemistry.	3	2	1	2	None		3					
MNF 100	Introduction to Engineering Materials.	1	1	-	-	None		1					
MNF 101	Engineering Graphics.	3	1	6	-	None		3					
MEC 101	Mechanics -1.	2	1	3	-	None		2					
MEC102	Mechanics-2.	2	1	3	-	MEC 101		2					
MTH 101	Mathematics-1(Algebra and Calculus).	3	2	2	-	None		3					
MTH 102	Mathematics-2(Integration and Analytic Geometry).	3	2	3	-	MTH 101		3					
PHY 101	Physics-1.	3	2	1	2	None		3					
PHY 102	Physics -2.	3	2	1	2	PHY 101		3					
MNF 102	Principles of Production Engineering.	3	1	-	4	MNF 101		3					
MTH 203	Mathematics -3(Differential Equations and Transforms).	3	2	3	-	MTH 102		3					
MTH 204	Mathematics-4(Advanced Calculus).	3	2	3	-	MTH 101		3					
MTH 305	Mathematics -5(Introduction to Prob. and Statistics)	2	1	3	-	MTH 102		2					
MTH 306	Mathematics -6 (Complex Analysis and P.D.E).	2	1	3	-	MTH 102		2					
Total		**36**						**36**					

Those courses establish (36) credit hours with percentage of 20 % of the total credit hours.

2.4.3. Basic Engineering Courses

Basic Engineering sciences Courses, Table 3. give the following knowledge and understanding and skills:

a) Integrating knowledge and understanding of mathematics and physical sciences to develop basic engineering laws and concepts related to the Manufacturing Engineering and Production Technology.
b) The ability to extend knowledge and develop models and methods and use techniques, principles and laws of engineering sciences in order to lead to engineering applications across disciplinary boundaries.
c) The ability to deal effectively with numbers and concepts to identify/solve complex and open ended engineering problems.

Table 3 Table of Core Basic Engineering Courses (63 Compulsory Credit Hours).

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
CMP 110	Program Design and Computer Languages.	4	2	3	2	None					٤		
ARC 210	Civil Engineering Technology.	3	2	3	-	None			3				
CMP 210	Data Structures and Algorithms.	3	2	2	-	CMP 110					٣		
ELC 211	Electrical Circuit Analysis-1.	3	2	1	2	MTH 102			3				
ELC 212	Electrical Circuit Analysis-2.	3	2	3	–	ELC 211			3				
ELC 213	Electrical Measurements.	3	2	1	2	ELC 215			3				
CMP 211	Logic Design-1.	4	3	1	2	MTH 101			4				
MNF 210	Mechanical Engineering Technology.	3	2	1	2	MEC 102 MNF 100			3				
ELC 214	Modern Theory for Semiconductor Devices.	3	2	1	2	PHY 102			3				
ELC 215	Semiconductors for Microelectronics.	3	2	1	2	ELC 214			3				
CMP 310	Engineering Computer Applications.	3	2	1	2	CMP 110					٣		
CMP 311	Numerical Methods with Computer Applications.	3	2	2	-	None					٣		
ELC 310	Control-1.(Principles of Automatic Control).	4	3	1	2	MTH 203			4				
ELC 311	Communications-1.	3	2	1	2	ELC 315			3				
ELC 312	Microelectronic Circuits-1	3	2	1	2	PHY 102			3				
ELC 313	Microelectronic Circuits-2	3	2	1	2	ELC 312			3				
ELC 314	Electronic Measurements.	3	2	1	2	ELC 215						3	
ELC 315	Signal Analysis.	3	2	2	–	MTH 305			3				
CMP 410	Microprocessor Based -Systems.	3	2	1	2	CMP 211					3		
ELC 410	Electrical Power Engineering.	3	2	1	2	ELC 211			3				
Total		**63**							**44**		**16**	**3**	

These courses need (63) credit hours establishing a percentage of 35% of the total credits.

2.4.4. Applied Engineering and design Courses and Projects

Applied engineering sciences Courses give the following knowledge and understanding and skills:

a) Attaining knowledge of operational practice, engineering codes and design techniques relevant to the Course
b) The ability to apply engineering knowledge and creative, iterative and open-ended procedures when conceiving and developing components, systems and processes.
c) The ability to integrate engineering knowledge, engineering codes, basic and mathematical sciences in designing a component, a system or a process.
d) The ability to work under constraints, taking into account time, economy, health and safety, social and environmental factors and applicable laws.

Table 4-a Core Applied Engineering Courses (34 Compulsory Credit Hours)

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
ELC 420	Control-2(Digital and PLC Control)	4	3	1	2	ELC 310				4			
ELC 421	Communications-2.	4	3	1	2	ELC 311				4			
ELC 422	Digital Signal Processing.	3	2	1	2	MTH 203 CMP 211				3			
ELC 423	Electromagnetic Field Theory	3	2	3	–	PHY 102				3			
ELC 424	Microwave Engineering	4	3	1	2	ELC 423				4			
ELC 521	Antennas and Wave Propagation.	4	3	1	2	ELC 423				4			
ELC 522	Communications-3 (Advanced Communications Systems).	4	3	1	2	ELC 421				4			
ELC 523	Communications-4(Information Theory and Coding).	4	3	1	2	ELC 522				4			
ELC 524	Radio and Television Engineering Systems.	4	3	1	2	ELC 315				4			
Total		**34**								**34**			

Table 4-b Applied Engineering Elective Courses (12 Credits)

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
ELC 431	Acoustics.	3	2	1	2	None							
ELC 432	Optical Fiber Communications.	3	2	1	2	None							
ELC 433	Radar Systems and Remote Sensing	3	2	3	–	ELC 315							
ELC 434	Very Large Scale Integrated Systems (VLSI Systems)	3	2	1	2	ELC 313							
ELC 531	Advanced Topics in Communications-2.	3	3	–	–	ELC 421							
ELC 532	Computer Controlled Systems and Applications to Communications.	3	2	3	– –	CMP 310 ELC 310							12
ELC 533	VHDL	3	2	–	2	ELC 313							
ELC 534	Mobile Communications.	3	2	3	–	ELC 421							
ELC 535	Microwave Circuits and Devices	3	2	1	2	ELC 424							
ELC 536	Advanced Microwave Measurements	3	2	–	2	ELC 424							
ELC 537	Communications Networks.	3	2	3	–	ELC 421							
ELC 538	Satellite Communications	3	2	1	2	ELC 421							
ELC 539	Modern Telephone Central Offices.	3	2	1	2	ELC 311							
Total		**12**											12

Table 4c Computer major courses (3 Credits from Computer Major)

Course Code	Total Credits	L	Contacts Hours		Course Title
			T	P	
CMP 421	3	2	2	-	Computer Architecture
CMP 422	3	2	1	2	Computer Graphics and Man Machine Interface
CMP 423	4	3	2	-	Data Base Management
CMP 425	3	2	2	-	Information Systems
CMP 426	3	2	1	2	Logic Design – 2
Total					

2.4.5. Projects & Training

The projects give the following knowledge and understanding and skills:

a) Gaining the knowledge and experience of applying the different principles and techniques introduced in the program of study.
b) The ability to work within defined constraints, tackle work which lacks a well-defined outcome or which has a wide range of possible solutions and exhibit creativity in dealing with unfamiliar real-life problems.
c) The ability to investigate, plan and execute technical research specific to the Manufacturing Engineering and Production Technology over an extended period of time; meeting deadlines and putting technical work in a social and commercial context.
d) The ability to work in a team, search published sources of information, interprets technical data and analyzes and presents findings in various ways.

Table 4-c Table of Projects and Industrial Training (16 Compulsory Credit Hours).

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
ELC 361	Seminar-1	1	-	1	2	72 Credits				1			
ELC 362	Seminar-2.	1	-	1	2	ELC 361				1			
ELC 461	Project-1.	2	1	1	2	108 Credits						2	
ELC 562	Project-2.	6	2	1	8	ELC 461						6	
ELC 563	Industrial Traning-1.	3	-	-	6	108 Credits						3	
ELC 564	Industrial Training-2.	3	-	-	6	ELC 563						3	
Total		**16**								2		14	

The industrial training is carried out in the third and the fourth summers. The results are included into the 9th and 10th semesters.

The total sum of credit hours devoted to applied engineering and design subjects, projects and industrial training is (65) Credit hours establishing a percentage of 36.11% of the total credit.

Table 5: Credit hours distribution

	Subject Area							Total Credit Hours	Percentage	Requirements of the Engineering Sector Committee
	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary			
Humanitarian Courses	16							**16**	**8.89**	**8-10%**
Mathematics and Basic Science Courses		36						**36**	**20**	**15-20%**
Basic Engineering Courses			44		16	3		**63**	**35**	**30-35%**
Applied Engineering Courses Including Projects & Training				36	3	14	12	**65**	**36.11**	**35-40%**
Total Credit Hours	**16**	**36**	**44**	**36**	**19**	**17**	**12**			
Percentage	**8.89**	**20**	**24.44**	**20**	**10.55**	**9.44**	**6.67**			
NARS Engineering Requirements	**9-12%**	**20-26%**	**20-23%**	**20-22%**	**9-11%**	**8-10%**	**6-8%**			

Table 6 shows the credit hours distribution and the requirements of:

- The engineering sector of the supreme council of higher education.
- The Egyptian NARS, August 2009 edition

It is evident that the current program fulfills the NARS and Engineering sector requirements.

2.4.6. Sample study plan :

Tables 7 thru 16 show a is a sample study plan, where the courses are distributed over ten major semesters.

Table 7 Freshman, First Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
CHE 100	Chemistry.	3	2	1	2
G EN 141	Contemporary Social Issues	2	2	-	-
MNF 101	Engineering Graphics	3	1	6	-
GEN 143	History of Engineering and Technology	2	2	-	-
MEC 101	Mechanics -1.	2	1	3	-
MTH 101	Mathematics -1 (Algebra and Calculus)	3	2	2	-
PHY 101	Physics -1	3	2	1	2
Total		**18**			

Table 8 freshman, Second Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
MNF 100	Introduction to Engineering Materials.	1	1	-	-
GEN 142	English Language.	2	2	-	-
MEC 102	Mechanics-2	2	1	3	-
MTH 102	Mathematics -2(Integration and Analytic Geometry)	3	2	3	-
PHY 102	Physics-2.	3	2	1	2
MNF 102	Principles of Production Engineering	3	1	-	4
CMP 110	Program Design and Computer Languages.	4	2	3	2
Total		**18**			

Table 9 sophomore, Third Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
ARC 210	Civil Engineering Technology.	3	2	3	-
ELC 211	Electrical Circuit Analysis-1	3	2	1	2
CMP 211	Logic Design-1.	4	3	1	2
ELC 214	Modern Theory for Semiconductor Devices	3	2	1	2
MTH 203	Mathematics -3 (Differential Equations and Transforms).	3	2	3	-
GEN 241	Presentation Skills.	2	2	-	-
Total		**18**			

Table 10 Sophomore, Fourth Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
CMP 210	Data Structures and Algorithms.	3	2	2	-
ELC 212	Electrical Circuit Analysis-2	3	2	3	-
ELC 213	Electrical Measurements.	3	2	1	2
MNF 210	Mechanical Engineering Technology.	3	2	1	2
MTH 204	Mathematics -4(Advanced Calculus)	3	2	3	-
GEN 242	Technical Report Writing	2	2	-	-
ELC 215	Semiconductors for Microelectronics	3	2	1	2
Total		**20**			

Table 11 Junior, Fifth Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
GEN 341	Project Management.	2	2	-	-
ELC 310	Control-1 (Principles of Automatic Control).	4	3	1	2
ELC 312	Microelectronic Circuits-1	3	2	1	2
ELC 314	Electronic Measurements	3	2	1	2
MTH 305	Mathematics -5 (Introduction to Probability. and Statistics).	2	1	3	-
ELC 315	Signal Analysis	3	2	2	-
ELC 361	Seminar-1	1	-	1	2
Total		**18**			

Table 12 Junior, Sixth Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
CMP 310	Engineering Computer Applications	3	2	1	2
CMP 311	Numerical Methods with Computer Applications.	3	2	2	-
ELC 311	Communications -1	3	2	1	2
ELC 362	Seminar-2.	1	-	1	2
ELC 313	Microelectronic Circuit-2	3	2	1	2
MTH 306	Mathematics -6(Complex Analysis and P.D.E)	2	1	3	-
GEN 35*	Elective Humanities No.1.	2	2	-	-
Total		**17**			

Table 13 Senior 1, Seventh Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
ELC 421	Communications-2.	4	3	1	2
ELC 423	Electromagnetic Field Theory.	3	2	3	-
CMP 410	Microprocessor Based Systems.	3	2	1	2
ELC 410	Electrical Power Engineering.	3	2	1	2
ELC 43*	Elective Communications No.1.	3			
GEN 45*	Elective Humanities No.2.	2	2	-	-
Total		**18**			

Table 14 Senior 1, Eighth Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
ELC 420	Control-2(Digital and PLC Control)	4	3	1	2
ELC 422	Digital Signal Processing.	3	2	1	2
ELC 424	Microwave Engineering.	4	3	1	2
ELC 461	Project-1	2	1	1	2
CMP 43*	Elective Computer. (Table 4-b p. 27)	3			
ELC 43*	Elective Communications No.2.	3			
Total		**19**			

Table 15 Senior 2, Ninth Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
ELC 522	Communications-3 (Advanced Communications Systems)	4	3	1	2
ELC 562	Project-2.(First Stage)	3	1	1	4
ELC 524	Radio and Television Engineering Systems.	4	3	1	2
ELC 563	Industrial Training-1	3	-	-	6
ELC 53*	Elective Communications No.3.	3			
Total		**17**			

Table 16 Senior 2, Tenth Semester

Code	Subject	Total Credits	L	Contact Hours	
				T	P
ELC 521	Antennas and Wave Propagation.	4	3	1	2
ELC 523	Communications-4(Inf. Theory and Coding)	4	3	1	2
ELC 562	Project-2 (Second Stage).	3	1	1	4
ELC 564	Industrial Tranning-2	3	-	-	6
ELC 53*	Elective Communications No.4	3			
Total		**17**			

2.5. Curriculum Mapping

The contribution of the individual courses to the program Intended Learning Outcomes are marked in the courses specifications and revised following the evaluation of the mapping matrix. Therefore, the courses specifications are approved by the department scientific council following the program specification approval.

Appendix 1 shows the curriculum mapping matrix, developed on the basis of the courses specifications. The mapping matrix shows that the program courses present balanced contribution to the program ILO's includes also two tables summarizing the program ILO's contributed by the individual courses and the courses contributing to the individual ILO's.

2.6. Courses Specifications

The detailed program courses specifications are given in **Appendix 2.** These courses specifications were revised and approved on **November 2013**. The contribution of each course to the program ILO's were considered during this revision.

3. Program Admission Requirements

- Admission is fully organized by the admission office of the Ministry of Higher Education.
- Secondary School Certificate Graduates of other countries are eligible to join this program if they met the minimum grades set by Admission Office of the Ministry of Higher Education.
- The study begins with a preparatory year for all students before specialization. Students' departmental allocation is in accordance with the Academy Council regulations.

4. Regulations for Progression and Program Completion

1) Attendance of program is on full-time basis.
2) The study follows the credit hour system with two major semesters, 15-week each and one, 8-week- semesters per year.
3) A minimum of 75 % student attendance to lectures, tutorials and laboratory exercises per course is conditional for taking the final exams of the course, in accordance with the Departmental Board

recommendation approved by the Faculty Council; otherwise students would be deprived from taking their final exam(s).

4) If a course includes written and oral / lab tests, the course evaluation is made according to the total mark of all tests in addition to the academic standing throughout the semester.
5) No mark is recorded for the student who fails to appear in the written examination.

The details of program progression and grades evaluation are explained by **Appendix 3**.

5. Student Assessment (Methods and rules for student assessment)

Table17 Students assessment methods

Method (tool)	Assessed ILO's
1- Written exam	A, B & C
2- Quizzes and reports	A, B & C
3- Oral exams	A, B & C
4- Practical	A &C
5- Project applied on a practical field problem	A, B, C & D
6- Other assessment methods	As stated in the courses specifications

Where:

A includes the program knowledge and understanding
B includes the intellectual skills
C includes the professional applied skills
D includes the general transferrable skills

6. Program Evaluation

Table 18 Program Evaluation

Evaluator	Tool	Periodicity
1- Students	Questionnaires	Annual
2- Alumni	Questionnaires	Bi-annual
3- Stakeholders	Questionnaires	Each 5 years
4- External Evaluator(s) (External Examiner (s))	Reports	Each 5 years
5- Other societal parties	Questionnaires	On request

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Appendix 1

Curriculum Mapping

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Appendix 1
Curriculum Mapping

The curriculum mapping was carried out according to the following procedures:

1) Extract the program ILO's covered by each course from the courses specifications and arrange them in a convenient table.
2) Develop four matrices for the courses with each of the four categories of program ILO's.
3) Study the developed matrices and find the needed tuning of courses specifications to insure balanced covering of the courses to program ILO's.
4) Carryout the required tuning process and prepare the final program specifications including the final mapping matrix.
5) Present the program specifications to the academic council for approval.
6) Carry out the necessary courses specifications tuning and present the courses specifications to the concerned academic council for approval.

A1.1 Program ILO.s covered by the individual courses

Table A1-1 carries the program ILO's covered by the individual courses.

Table A1-1 Program ILO's covered by the program courses

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
CHE 100	Chemistry	A1, A3, A4, A5, A6, A8,A11, A12	B1, B2, B3, B4, B6, B8, B10, B12	C1, C2, C3, C5, C8, C12	D1, D2, D3, D4, D5, D7
GEN 141	Contemporary Social Issues	A9, A10	B4, B9, B12	C1, C5	D1, D3, D7, D9
MNF 100	Introduction to engineering materials	A3, A4, A18	B1, B2, B5, B13,B15,B17	C1, C2	D1, D3, D7, D9
GEN 143	History of Engineering & Technology	A1, A8, A9, A11, A14	B1, B2, B6, B7	C1, C5	D1,D7, D8
MEC 101	Mechanics – (1)	A1, A3, A4	B1, B2	C1, C13	D1, D2
MTH 101	Mathematics – (1)	A1, A5	B1, B2, B3, B7	C1, C13	D3, D7
PHY 101	Physics (1)	A1, A3, A4, A13	B1, B2, B3, B7 B17, B20	C1, C6, C12, C16, C17	D1, D2, D3, D4, D5, D6, D7,D8,D9
MNF 101	Engineering Graphics	A4, A8, A10	B3, B5 ,B7 ,B8,B9	C2, C2, C4 ,C11	D1, D3 ,D9
GEN 142	English language	A9, A10	B4	C11, C12	D1, D2, D3, D4, D6, D7, D8

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
MEC 102	Mechanics – (2)	A1, A4, A5	B1, B2, B5, B13, B15	C1,C13	D1, D2
MTH 102	Mathematics – (2)	A1, A5	B1, B2, B3, B4, B7, B11	C1, C12	D1, D3, D7
PHY 102	Physics (2)	A1, , A3, , A5	B2, B3, B4, B5,	C1, C5, C12	D5, D7
MNF 102	Principles of production Engineering	A1, A4	B2,B3,B10,B18	C1,C3,C7	D1, D3 ,D7 ,D9
MTH203	Mathematics -3	A1, A5	B1, B2, B3, B7	C1, C13	D3, D7
MTH204	Mathematics-4	A1, A5	B1, B2, B3, B7	C1, C13	D3, D4
MTH 305	Mathematics-5	A1, A5	B1, B2, B3, B7, B11	C1, C13	D3, D7
MTH 306	Mathematics-6	A1, A5	B1, B2, B3, B4, B7	C1, C13	D1, D3, D7
GEN241	Presentation Skills	A9, A10, A12	B14	C11	D1, D2, D3, D5, D7
GEN 242	Technical Report Writing	A 4, A10, A11	B4	C2, C12	D3, D4, D7, D9
GEN 341	Project Management	A1, A3, A4, A10	B9	C12	D1, D3 , D6, D7, D9
GEN 353	Management, International Business, and Total Quality Management	A6, A7, A10, A12	B3, B4, B5, B9, B10	C1, C5	D1, D3, D7, D9
ARC 210	Civil Engineering Technology	A7, A14	B9, B16	C1, C2	D3, D8
ELC211	Electrical Circuit Analysis-1	A1, A4, A5, A8, A15	B1, B2, B4, B5, B6, B7	C1, C3, C5, C6, C9, C10, C11	D1, D2, D3, D6, D7, D9
ELC212	Electrical Circuit Analysis-2	A1, A2, , A4, A5, A23	B1, B2, B3, B4, B5, B6, B7	C1, C2	D1, D2, D3, D7, D9
ELC 213	Electrical Measurements	A1, A4, A14,&A15	B1,B3,B5,B6,B7 ,B9,B10,B11,B13, & B14	C2,C3,C5,C15, C16,C17,C18,& C20	D1,D3,D6,D8,& D9
ELC214	Modern Theory for Semiconductor Devices	A1, A2, A3, A4, A8, A9	B1, B2, B4, B5, B6, B7, B8, B9, B11, B12	C1, C2,C3, C4, C7, C8, C11, C12	D1, D3, D4, D7, D9
ELC215	Semiconductor for Microelectronics	A1, A2, A3, A4	B1, B2, B4, B5, B6, B7, B8, B9, B11, B12	C1, C2,C3, C4, C7, C8, C11, C12	D1, D3, D4, D7, D9
ELC310	Control- I	A1,A4,A5,A16	B1,B2,B5,B7,B13	C1,C2,C3,C5, C11,C12,C14,C17	D1,D3,D7,D9

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
ELC311	Communications-1	A18, A24, A27	B7, B15.	C19, C20.	D3, D5, D6, D7.
ELC312	Microelectronics Circuits-1	A3, A4 , A8 , A13, A23	B2 , B5 , B7	C3 , C17	D3, D5 , D6 ,D7
ELC313	Microelectronics Circuits-2	A1, A3,A4,A15, A23	B2,B3,B5	C1,C7,C15,C18	D2,D3,D6,D7 ,D9
ELC314	Electronic Measurements1	A5,A10,A15	B2, B3 ,B12	C3, C12 , C15, C20	D4 ,D6 ,D7
ELC315	Signal Analysis	A5, A24	B2, B11	C1, C13	D3, D6, D7, D9.
ELC361	Seminar-1	A10, A12	B14	C5, C8, C12, C15, C18	D1, D2, D3, D5, D7
ELC362	Seminar-2	A10, A12	B14	C5, C8, C12, C15, C18	D1, D2, D3, D5, D7
ELC 410	Electrical Machines and Power	A1, A3, A4,A5, A6, A7, A8, A11, A13, A14, A15, A16	B1, B2, B3, B6, B9, B11	C1, C2, C4, C5, C8	D2, D3, D6, D7, D8
ELC 420	Control- 2	,A4,A5,A8,&A16	B1,B2,B3,B5,B7, B12,&B13	C1,C2,C3,C5,C6 ,C11,C12,C13, C14,&C17	D1,D3,D7,&D9
ELC421	Communications-2	A18, A24, A26, A27	B15, B19	C19, C20	D3, D6, D7
ELC 422	Digital Signal Processing	A2, A5, A8, A10 & A24	B1, B3, B7, B11, B14 & B15	C2, C5, C6, C12, C14 & C15	D3, D4 & D7
ELC423	Electromagnetic Field Theory	A1, A21	B1, B2	C1, C13	D6
ELC424	Microwave Engineering	A20,A21	B15,B16,B18	C17,C20	D6, D9
ELC432	Optical Fiber Communications	A22, A24, A25	B2, B12, B17	C15, C18	D2, D6, D7
ELC433	Radar System and Remote Sensing	A1,A2,A4,A18, A20,A21,A24,A28	B2,B4,B5,B15 ,B17	C1, C2	D1,D4,D7,D9
ELC 434	Very Large Scale Integrated Systems	A5, A8, A10, A12, A15, A23	B1, B3, B9, B12	C1, C2, C3, C5, C9, C12, C15, C18	D3, D4, D7
ELC 461	Project 1	A1, A2, A4, A8, A14, A15	B2, B3, B5, B6, B19	C2, C3, C12, C14, C15, C18, C20	D1, D2, D3, D5, D6, D7, D8
ELC 521	Antennas and Wave Propagation	A1, A2, A21, A29, A26	B1, B2, B7., B19	C1, C2, C5, C14, C20	(D2, D6)

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
ELC522	Communications -3	A18, A26, A27	B2, B15, B18	C15, C18, C19	D3, D6, D7
ELC523	Communications-4	A2, A4, A17, A18	B1, B2, B3, B11, B14	C5, C6, C12, C13	D3, D6, D7
ELC 533	VHDL (Advanced Digital Electronic)	A8, A13, A15, A16, A19, A29	B1, B2, B3, B4, B8,B9,B11,B12, B13,B15,B17,B18, B19	C1, C3, C7,C10, C14,C15,C19, C20, C21	1, D3, D7, D9
ELC524	Radio and Television Engineering Systems	A18, A24, A27, A26, A29	B5, B15	C15, C17, C19	D3, D6, D7
ELC 534	Mobile communication	A27, A28	B15, B19	C1, C13	D4, D7, D9
ELC535	Microwave Circuit and Devices	A15,A20	B16,B17	C15,C17,C20	D7, D9
ELC٥٣٧	Communications Networks	A2, A5, A13, A18, A19, A27, A28	B9, B15, B18	C1, C13	D1, D2, D3, D4, D7, D9
ELC562	Project-2	A2, A4, A6, A7, A8, A9, A10, A11, A12, A14, A15, A16, A17	B1, B3, B4, B5, B7, B8, B9, B12, B13, B14, B15, B16	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16, C17	D1, D2, D3, D4, D5, D6, D7, D8, D9
ELC563	Industrial Training -1	A2, A4, A6, A7, A8, A9, A10, A11, A12, A14, A15, A16, A17	B1, B3, B4, B5, B7, B8, B9, B12, B13, B14, B15, B16	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16, C17	D1, D2, D3, D4, D5, D6, D7, D8, D9
ELC564	Industrial Training -2	A2, A4, A6, A7, A8, A9, A10, A11, A12, A14, A15, A16, A17	B1, B3, B4, B5, B7, B8, B9, B12, B13, B14, B15, B16	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16, C17	D1, D2, D3, D4, D5, D6, D7, D8, D9
CMP 110	Program Design and Computer Languages	A1,A4,A5,A8,A13,A15,A16, A18	B1,B2,B3,B4,B7,B13, B14, B17, B18 , B19,	C1,C2,C3,C4, C5,C6 , C13, C14, C15	D1, D2 ,D3, D4, D5, D7, D9
CMP 210	Data Structures and Algorithms	A1, A4, A5, A9, A12, A16,A18	B1, B2, B4, B8, B12, B14, B17, B18	C13	D1, D2, D3, D4, D6, D7
CMP 211	Logic Design-1	A1, A5, A14	B1, B2, B3, B4, B8, B12, B14	C1, C2, C3, C5, C6	D3, D4, D5, D6, D7, D9
CMP 310	Engineering Computer Applications	A1, A5, A12, A13, A16	B1, B2, B3, B5, B7, B13, B14, B17,B18	C1, C2,C3,C4,C5, C6, C7,C14,C15	D1, D3, D4, D5,D7, D9
CMP 311	Numerical Methods with Computer Applications	A1,A5 A8, A12, A13, A16	B1, B2, B3, B8, B13	C1, C13	D1, D3, D4, D5,D7,D9
CMP 410	Microprocessor Based-Systems	A4, A9, A14, A15, A16, A18	B1, B2, B3, B4, B5, B6, B9, B11, B12, B13, B16, B17	C5, C6, C12, C14, C15	D3, D5, D7, D9

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
CMP 421	Computer Architecture	A1, A4, A5, A8, A10,A13, A15	B1,B2,B3,B4,B5, B6,B7,B12,B13 B17	C2, C3	D1,D3,D4,D5,D6, D7,D9
CMP 422	Computer Graphics and Man-Machine Interface	A1, A2, A4, A8, A12, A15, A16	B1,B2, B3, B7, B8, B10,B13	C1, C2, C3,C4, C5,C6,C7, C11,C13, C15	D1, D3, D4,D6, D7, D8, D9
CMP423	Database Management	A1, A2, A4, A13, A15, A16, A17	B2, B3, B7, B8, B9, B12, B15, B17	C13	D1, D3, D4, D7, D9
CMP 425	Information Systems	A1, A2, A7,,A8, A 9, A12 A18, A19, A20	B1,B2,B3,B4, B12,B14 ,B18. B19	C13	D1, D3, D4, D5,D6,D7, D9
CMP 426	Logic Design-2	A1, A2, A4, A9, A14	B1, B3, B4, B6, B7,B8, B12, B14, B17	C1, C2, C3, C4, C5, C6	D1, D2, D3, D4, D5, D6, D7, D9

A1.2 Curriculum Mapping Matrices

Table A1-2 Program Mapping Matrix; Courses/Knowledge and Understanding (A's)

Code	Subject	Knowledge and understanding																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
CHE 00	Chemistry	1		1	1	1	1		1			1	1																	
PHY101	Physics (1)	١		١	١									1																
PHY102	Physics (2)	١		١		١																								
MTH101	Mathematics – (1)	١				١																								
MEC102	Mechanics – (2)	١			١	١																								
MTH203	Mathematics – (3)	1				1																								
MTH 204	Mathematics – (4)	1				1																								
MTH305	Mathematics – (5)	1				1																								
MTH306	Mathematics – (6)	1				1																								
MEC101	Mechanics – (1)	١		١	١																									
MTH102	Mathematics – (2)	١		1		١																								
GEN141	Contemporary Social Iss.									1	1																			
GEN142	English language									1	1																			
GEN143	History of Engineering & Technology	١				1			١	١		١			١															
GEN241	Presentation Skills									1	1		1																	
GEN242	Technical Report Writing				1						1	1																		
GEN341	Project Management	1		1	1						1																			
GEN353	Management, International Business, and Total Quality Management						1	1			1		1																	
MNF100	Introduction to engineering materials			1	1														1											

Code	Subject	Knowledge and understanding																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
MNF101	Engineering Graphics				1	1			1		1																			
MNF102	Principles of Prod. Eng.	1			1																									
ARC210	Civil Engineering Technology							1							1															
ELC211	Electrical Circuit Analysis-1	1			1	1			1							1														
ELC 212	Electrical Circuit Analysis-2	1	1		1	1																		1						
ELC 213	Electrical Measurements	1			1										1	1														
ELC 214	Modern Theory for Semiconductor Devices	1	1	1	1				1	1																				
ELC 215	Semiconductor for Microelectronics	1	1	1	1																									
ELC 310	Control – I	1			1	1											1													
ELC 311	Communications-1																		1						1			1		
ELC 312	Microelectronics Circuits-1			1	1				1					1										1						
ELC 313	Microelectronics Circuits-2	1		1	1											1								1						
ELC 314	Electronic Measurements					1					1					1														
ELC 315	Signal Analysis					1																			1					
ELC 361	Seminar-1									1		1																		
ELC 362	Seminar-2									1		1																		
ELC 410	Electrical Machines and Power ngineering	1		1	1	1	1	1	1			1		1	1	1	1													
ELC 420	Control –2	1			1	1			1								1													
ELC 421	Communications-2																		1						1			1		
ELC 422	Digital Signal Processing		1			1			1		1														1					

Code	Subject	Knowledge and understanding																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
ELC 423	Electromagnetic Field Theory	1																				1								
ELC 424	Microwave Engineering																				1	1								
ELC 432	Optical Fiber Communications																						1		1	1				
ELC 433	Radar System and Remote Sensing	1	1		1														1			1			1				1	
ELC 434	Very Large Scale Integrated Systems					1			1		1		1			1								1						
ELC 461	Project 1	1	1		1				1						1	1														
ELC 521	Antenna and Wave Propagation	1	1			1																1								1
ELC 522	Communications -3																	1	1								1	1		
ELC 523	Communications -4		1		1														1	1								1		
ELC 524	Radio and Television Engineering Systems																		1						1		1	1		1
ELC 533	VHDL (Advanced Digital Electronic)								1					1		1	1			1										1
ELC 534	Mobile communication																											1	1	
ELC 535	Microwave Circuit and Devices															1					1									
ELC 537	Communications Networks		1			1								1					1	1								1	1	
ELC 562	Project -2		1		1		1	1	1	1	1	1	1		1	1	1	1												
ELC 563	Industrial Training -1		1		1		1	1	1	1	1	1	1		1	1	1	1												
ELC 564	Industrial Training -2		1		1		1	1	1	1	1	1	1		1	1	1	1												
CMP 110	Program Dgn.& Comp. Lan.	1			١	١			١					1		1	1		1											
CMP210	Data Structures and Algorithms	1		1	1	1				1			1				1		1											
CMP211	Logic Design-1	1		1	1	1									1															

Code	Subject	Knowledge and understanding																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
CMP310	Engineering Computer Applications	1				1							1	1			1													
CMP311	Numerical Methods with Computer Applications	1				1			1								1	1												
CMP410	Microprocessor Based-Systems				1					1					1	1	1		1											
CMP421	Computer Architecture	1			1	1			1		1			1		1														
CM 422	Computer Graphics and Man-Machine Interface	1	1		1				1				1			1	1													
CMP423	Database Management	1	1		1									1		1	1													
CMP424	Data Transmission and Computer Networks	1	1				1		1				1			1		1		1	1									
CMP425	Information Systems	1	1					1	1	1			1						1	1	1									
CM 426	Logic Design-2	1	1		1					1					1															

Table A1-3 Program Mapping Matrix; Courses/Intellectual Skills (B's)

Code	Subject	Intellectual skills																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CHE 100	Chemistry	1	1	1	1		1		1		1		1							
PHY 101	Physics (1)	1	1	1				1										1		
PHY 102	Physics (2)		1	1	1	1														
MTH 101	Mathematics – (1)	1	1	1				1												
MTH 102	Mathematics – (2)	1	1	1	1			1				1								
MTH 203	Mathematics – (3)	1	1	1				1												
MTH 204	Mathematics – (4)	1	1	1				1												
MTH 305	Mathematics – (5)	1	1	1				1				1								
MTH 306	Mathematics – (6)	1	1	1				1				1								
MEC 101	Mechanics – (1)	1	1																	
MEC 102	Mechanics – (2)	1	1			1								1						
GEN 141	Contemporary Social Iss.				1					1			1							
GEN 142	English language				1															
GEN 143	History of Engineering & Technology	1	1				1	1												
GEN 241	Presentation Skills														1					
GEN 242	Technical Report Writing				1															
GEN 341	Project Management									1										
GEN 353	Management, International Business, and Total Quality Management			1	1	1				1	1									
MNF 100	Introduction to engineering materials	1	1			1								1		1		1		
MNF 101	Engineering Graphics			1		1		1	1	1										
MNF 102	Principles of Prod. Eng.		1	1							1								1	

Code	Subject	Intellectual skills																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ARC 210	Civil Engineering Technology									1							1			
ELC 211	Electrical Circuit Analysis-1	1	1		1	1	1	1												
ELC 212	Electrical Circuit Analysis-2	1	1	1	1	1	1	1												
ELC 213	Electrical Measurements	1		1		1	1	1		1	1	1		1	1					
ELC 214	Modern Theory for Semiconductor Devices	1	1		1	1	1	1	1	1		1	1							
ELC 215	Semiconductor for Microelectronics	1	1		1	1	1	1	1	1		1	1							
ELC 310	Control – I	1	1			1		1						1						
ELC 311	Communications-1							1								1				
ELC 312	Microelectronics Circuits-1		1			1		1												
ELC 313	Microelectronics Circuits-2		1	1		1														
ELC 314	Electronic Measurements		1	1									1							
ELC 315	Signal Analysis		1									1								
ELC 361	Seminar-1														1					
ELC 362	Seminar-2														1					
ELC 410	Electrical Machines and Power Engineering	1	1	1			1			1		1								
ELC 420	Control –2	1	1	1		1		1					1	1						
ELC 421	Communications-2															1				1
ELC 422	Digital Signal Processing	1		1				1				1			1	1				
ELC 423	Electromagnetic Field Theory	1	1																	
ELC 424	Microwave Engineering															1	1		1	
ELC 432	Optical Fiber Communications		1										1					1		
ELC 433	Radar System and Remote Sensing		1		1	1									1		1			
ELC 434	Very Large Scale Integrated Systems	1		1						1			1							

Code	Subject	Intellectual skills																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ELC 461	Project 1		1	1		1	1													1
ELC 521	Antenna and Wave Propagation	1	1					1												1
ELC 522	Communications -3		1													1			1	
ELC 523	Communications -4		1	1								1				1				
ELC 524	Radio and Television Engineering Systems					1										1				
ELC 533	VHDL (Advanced Digital Electronic)	1	1	1	1				1	1		1	1	1		1		1	1	1
ELC 534	Mobile communication															1				1
ELC 535	Microwave Circuit and Devices																1	1		
ELC 537	Communications Networks									1						1			1	
ELC 562	Project -2	1		1	1	1		1	1	1			1	1	1	1	1			
ELC 563	Industrial Training - 1	1		1	1	1		1	1	1			1	1	1	1	1			
ELC 564	Industrial Training - 2	1		1	1	1		1	1	1			1	1	1	1	1			
CMP 110	Program Dgn.& Comp.Lan.	١	١	١	١			١						١	١			١	١	١
CMP 210	Data Structures and Algorithms	١	١		١				١				١		١			١	١	
CMP 211	Logic Design-1	١	١	١	١				١				١		١					
CMP 310	Engineering Computer Applications	1	1	1		1		1						1	1			1	1	
CMP 311	Numerical Methods with Computer Applications	1	1	1					1					1						
CMP 410	Microprocessor Based-Systems	1	1	1	1	1	1			1		1	1	1			1	1		
CMP 421	Computer Architecture	1	1	1	1	1	1	1					1	1				1		
CMP 422	Computer Graphics and Man-Machine Interface	1	1	1				1	1		1			1						
CMP 423	Database Management		1	1				1	1	1			1			1		1		
CMP 425	Information Systems	1	1	1	1								1		1				1	1
CMP 426	Logic Design-2	1		1	1		1	1	1				1		1			1		

Table A1-4 Program Mapping Matrix; Courses/ Professional and practical skills (C's)

Code	Subject	Professional and practical skills																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
CHE 100	Chemistry	1	1	1		1			1				1									
PHY 101	Physics (1)	1					1						1				1	1				
PHY 102	Physics (2)	1				1							1									
MTH 101	Mathematics – (1)	1												1								
MTH 102	Mathematics – (2)	1												1								
MTH 203	Mathematics – (3)	1												1								
MTH 204	Mathematics – (4)	1												1								
MTH 305	Mathematics – (5)	1												1								
MTH 306	Mathematics – (6)	1												1								
MEC 101	Mechanics – (1)	1												1								
MEC 102	Mechanics – (2)	1												1								
GEN 141	Contemporary Social Iss.	1				1																
GEN 142	English language											1	1									
GEN 143	History of Engineering & Technology	1				1																
GEN 241	Presentation Skills											1										
GEN 242	Technical Report Writing		1										1									
GEN 341	Project Management												1									
GEN 353	Management, International Business, and Total Quality Management	1				1																
MNF 100	Introduction to engineering materials	1	1																			
MNF 101	Engineering Graphics		1	1	1							1										

Code	Subject	Professional and practical skills																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MNF 102	Principles of Prod. Eng.	1		1				1														
ARC 210	Civil Engineering Technology	1	1																			
ELC 211	Electrical Circuit Analysis-1	1		1		1	1			1	1	1										
ELC 212	Electrical Circuit Analysis-2	1	1																			
ELC 213	Electrical Measurements		1	1		1										1	1	1	1		1	
ELC 214	Modern Theory for Semiconductor Devices	1	1	1	1			1	1			1	1									
ELC 215	Semiconductor for Microelectronics	1	1	1	1			1	1			1	1									
ELC 310	Control – I	1	1	1		1						1	1		1			1				
ELC 311	Communications-1																			1	1	
ELC 312	Microelectronics Circuits-1			1														1				
ELC 313	Microelectronics Circuits-2	1						1								1			1			
ELC 314	Electronic Measurements			1									1			1					1	
ELC 315	Signal Analysis	1												1								
ELC 361	Seminar-1					1			1				1			1			1			
ELC 362	Seminar-2					1			1				1			1			1			
ELC 410	Electrical Machines and Power Engineering	1	1		1	1			1													
ELC 420	Control –2	1	1	1		1	1					1	1	1	1			1				
ELC 421	Communications-2																			1	1	
ELC 422	Digital Signal Processing		1			1	1						1		1	1						
ELC 423	Electromagnetic Field Theory	1	1																			
ELC 424	Microwave Engineering																	1			1	
ELC 432	Optical Fiber Communications															1			1			

Code	Subject	Professional and practical skills																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ELC 433	Radar System and Remote Sensing	1	1																			
ELC 434	Very Large Scale Integrated Systems	1	1	1		1				1			1			1			1			
ELC 461	Project 1		1	1									1		1	1			1		1	
ELC 521	Antenna and Wave Propagation	1	1			1									1						1	
ELC 522	Communications -3															1			1	1		
ELC 523	Communications -4												1	1	1							
ELC 524	Radio and Television Engineering Systems															1		1		1		
ELC 533	VHDL (Advanced Digital Electronic)	1		1				1			1				1	1				1	1	1
ELC 534	Mobile communication	1												1								
ELC 535	Microwave Circuit and Devices															1		1			1	
ELC 537	Communications Networks	1												1								
ELC 562	Project -2	1	1	1	1	1	1	1	1	1		1				1	1	1				
ELC 563	Industrial Training -1	1	1	1	1	1	1	1	1	1		1				1	1	1				
ELC 564	Industrial Training -2	1	1	1	1	1	1	1	1	1		1				1	1	1				
CMP 110	Program Dgn.& Comp.Lan.	1	1	1	1	1	1							1	1	1						
CMP 210	Data Structures and Algorithms													1								
CMP 211	Logic Design-1	١	١	١		١	١															
CMP 310	Engineering Computer Applications	1	1	1	1	1	1	1							1	1						
CMP 311	Numerical Methods with Computer Applications	1												1								
CMP 410	Microprocessor Based-Systems					1	1						1		1	1						
CMP 421	Computer Architecture		1	1																		

Code	Subject	Professional and practical skills																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
CMP 422	Computer Graphics and Man-Machine Interface	1	1	1	1	1	1	1				1		1		1						
CMP 423	Database Management													1								
CMP 425	Information Systems													1								
CMP 426	Logic Design-2	1	1	1	1	1	1															

Table A1-5 Program Mapping Matrix; Courses/ General and transferable skills (D's)

Code	Subject	General and transferable skills								
		1	2	3	4	5	6	7	8	9
CHE 100	Chemistry	1	1	1	1	1		1		
PHY 101	Physics (1)	1	1	1	1	1	1	1	1	1
PHY 102	Physics (2)					1		1		
MTH 101	Mathematics – (1)			1				1		
MTH 102	Mathematics – (2)	1		1				1		
MTH 203	Mathematics – (3)			1				1		
MTH 204	Mathematics – (4)			1	1					
MTH 305	Mathematics – (5)			1				1		
MTH 306	Mathematics – (6)	1		1				1		
MEC 101	Mechanics – (1)	1	1							
MEC 102	Mechanics – (2)	1	1							
GEN 141	Contemporary Social Issues	1		1				1		1
GEN 142	English language	1	1	1	1		1	1	1	
GEN 143	History of Engineering & Technology	1						1	1	
GEN 241	Presentation Skills	1	1	1		1		1		
GEN 242	Technical Report Writing			1	1			1		1
GEN 341	Project Management	1		1			1	1		1
GEN 353	Management, International Business, and Total Quality	1		1				1		1
MNF 100	Introduction to engineering materials	1		1				1		1
MNF 101	Engineering Graphics	1		1						1
MNF 102	Principles of production Engineering	1		1				1		1
ARC 210	Civil Engineering Technology			1					1	
ELC 211	Electrical Circuit Analysis-1	1	1	1			1	1		1
ELC 212	Electrical Circuit Analysis-2	1	1	1				1		1
ELC 213	Electrical Measurements	1		1			1		1	1

Code	Subject	General and transferable skills								
		1	2	3	4	5	6	7	8	9
ELC 214	Modern Theory for Semiconductor Devices	1		1	1			1		1
ELC 215	Semiconductor for Microelectronics	1		1	1			1		1
ELC 310	Control – I	1		1				1		1
ELC 311	Communications-1			1		1	1	1		
ELC 312	Microelectronics Circuits-1			1		1	1	1		
ELC 313	Microelectronics Circuits-2		1	1			1	1		1
ELC 314	Electronic Measurements				1		1	1		
ELC 315	Signal Analysis			1			1	1		1
ELC 361	Seminar-1	1	1	1		1		1		
ELC 362	Seminar-2	1	1	1		1		1		
ELC 410	Electrical Machines and Power Engineering		1	1			1	1	1	
ELC 420	Control –2	1		1				1		1
ELC 421	Communications-2			1			1	1		
ELC 422	Digital Signal Processing			1	1			1		
ELC 423	Electromagnetic Field Theory						1			
ELC 424	Microwave Engineering						1			1
ELC 432	Optical Fiber Communications		1				1	1		
ELC 433	Radar System and Remote Sensing	1			1			1		1
ELC 434	Very Large Scale Integrated Systems			1	1			1		
ELC 461	Project 1	1	1	1		1	1	1	1	
ELC 521	Antenna and Wave Propagation		1				1			
ELC 522	Communications -3			1			1	1		
ELC 523	Communications -4			1			1	1		
ELC 524	Radio and Television Engineering Systems			1			1	1		
ELC 533	VHDL (Advanced Digital Electronic)	1		1				1		1
ELC 534	Mobile communication				1			1		1

Code	Subject	General and transferable skills								
		1	2	3	4	5	6	7	8	9
ELC 535	Microwave Circuit and Devices							1		1
ELC 537	Communications Networks	1	1	1	1			1		1
ELC 562	Project -2	1	1	1	1	1	1	1	1	1
ELC 563	Industrial Training -1	1	1	1	1	1	1	1	1	1
ELC 564	Industrial Training -2	1	1	1	1	1	1	1	1	1
CMP 110	Program Design and Computer Languages	1	1	1	1	1		1		1
CMP 210	Data Structures and Algorithms	1	1	1	1		1	1		
CMP 211	Logic Design-1			١	١	١	١	١		١
CMP 310	Engineering Computer Applications	1		1	1	1		1		1
CMP 311	Numerical Methods with Computer Applications	1		1	1	1		1		1
CMP 410	Microprocessor Based-Systems			1		1		1		1
CMP 421	Computer Architecture	1		1	1	1	1	1		1
CMP 422	Computer Graphics and Man-Machine Interface	1		1	1		1	1	1	1
CMP 423	Database Management	1		1	1			1		1
CMP 425	Information Systems	1		1	1	1	1	1		1
CMP 426	Logic Design-2	1	1	1	1	1	1	1		1

The preceding four tables includes the mapping matrix relating the program courses with the program ILO's. The program ILO's contributed by each course were determined in the course specification, **Appendix 2**. These tables showed that the program courses gave balanced coverage of the program ILO's.

Appendix 2

Courses Specifications

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The courses of the Electronics and Telecommunications Technology BSc Program are given in Table A2-1, Followed by the courses description.

Table A2-1 Electronics and Telecommunications Technology BSc Program Courses

Course Code	**Course Title**	**No. of Credit Hours**
CHE 100	Chemistry	3
PHY101	Physics-1	3
PHY102	Physics-2	3
MTH 101	Mathematics-1	2
MTH 102	Mathematics-2	3
MTH 203	Mathematics-3	3
MTH 204	Mathematics-4	3
MTH 305	Mathematics-5	2
MTH 306	Mathematics-6	2
MEC 101	Mechanics-1	2
MEC 102	Mechanics-2	2
GEN 141	Contemporary Social Issues	2
GEN 142	English Language	2
GEN 143	History of science and Technology	2
GEN 241	Presentation Skills	2
GEN 242	Technical Report Writing	2
GEN 341	Project Management	2
GEN 353	Management, International Business, and Total Quality Management	1
MNF 100	Introduction to Engineering Materials	1
MNF 101	Engineering Graphics	3
MNF 102	Principle of Production Engineering	3
ARC 210	Civil Engineering Technology	3
ELC 211	Electrical Circuit Analysis-1	3
ELC 212	Electrical Circuit Analysis-2	3
ELC 213	Electrical Measurements	3
ELC 214	Modern Theory for Semiconductor Devices	3
ELC 215	Semiconductor for Microelectronics	3
ELC 310	Control – I	4
ELC 311	Communications-1	3
ELC312	Microelectronics Circuits-1	3
ELC 313	Microelectronics Circuits-2	3
ELC 314	Electronic Measurements	3
ELC 315	Signal Analysis	3
ELC 361	Seminar-1	1
ELC 362	Seminar-2	1
ELC 410	Electrical Power Engineering	3
ELC 420	Control –2	4

Course Code	Course Title	No. of Credit Hours
ELC 421	Communications-2	4
ELC 422	Digital Signal Processing	3
ELC 423	Electromagnetic Field Theory	3
ELC 42٤	Microwave Engineering	4
ELC 432	Optical Fiber Communications	3
ELC 433	Radar System and Remote Sensing	3
ELC 434	Very Large Scale Integrated Systems	3
ELC 461	Project 1	2
ELC 521	Antenna and Wave Propagation	4
ELC 522	Communications -3	4
ELC 523	Communications -4	4
ELC 524	Radio and Television Engineering Systems	4
ELC 533	VHDL (Advanced Digital Electronic)	3
ELC 534	Mobile communication	3
ELC 535	Microwave Circuit and Devices	3
ELC 537	Communications Networks	3
ELC 538	Satellite communication	3
ELC 562	Project -2	3
ELC 563	Industrial Training -1	3
ELC 56٤	Industrial Training -٢	3
CMP 110	Program Design and Computer Languages	4
CMP 210	Data Structures and Algorithms	3
CMP 211	Logic Design-1	4
CMP 310	Engineering Computer Applications	3
CMP 311	Numerical Methods with Computer Applications	3
CMP 410	Microprocessor Based-Systems	3

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

CHE 100: Chemistry

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Electrical Engineering Department Architecture Engineering Department Mechanical Engineering Department
Department offering the course:	Basic Science Department.
Date of specifications approval:	September 2015

B - Basic information

Title: Chemistry	Code: CHE 100	Level: Freshman, First Semester	
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 1	Practical: 2
	Pre-requisite: non		

C - Professional information

1 - Course Learning Objectives:

By the end of this course the students should be able to demonstrate the knowledge and understanding of the basic concepts of engineering chemistry and its applications in industrial fields.

2 - Intended Learning Outcome

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

By the end of the course the student should demonstrate knowledge and understanding of:

a1- Key facts, concepts, principles and techniques of Gas and Liquid states of Matter. (A1,A3)

a2- Theories relevant to Electrochemistry, solutions and thermo chemistry.(A1,A3,A5,A4,A8,A11,A12)

a3- Some chemical industries in different fields such as eng. practices and regulatory farm works in chem.. Eng. Industry. (A3,A4,A5,A6, A11,A12)

a4- Technology Supporting water treatments and Desalination Techniques.(A4,A6,A11)

a5- Scientific principles of petroleum extraction and refining(A1,A3.A4.A7).

a6- Basic principles for fuel classification and knowing its optimum characteristics, also identify advantage and disadvantage of them (A1,A5,A6,A11,A12).

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Apply chem. Principles and analytical thinking to problems of Gases, Liquids and electrochemistry and determine its effective solutions.(B1,B2,B8,B12)

b2- Select and develop appropriate Some petrochemical Technologies.(B6)

b3- Exercise professional judgment with respect to commercial and technical risks.(B1)
b4- Overlap different scientific subjects to reach a new scientific systems with a better quality. (B1,B3.B4,B12,B10)
b5-Think in a creative new scientific ideas which are not exist in present time to be used in the fee ten line the field of development of energy recourses, pollution problem, new industrial products.(B3, B12)
b6- Select appropriate solutions for corrosion problems based on analytical thinking.(B1,B2,B6,B8)
b7- Consider the applicability, economy and risk management.(B4)
b8-Maintain a systematic and methodic approach in dealing with new advanced industrial products.(B1)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1-Apply knowledge of scientific equipment and instrumentation competently to determine known concentration and solve its problem.(C1,C5)
c2- Employ computational facilities, measuring instruments, Laboratory tools and equipment to design an experiment to treat underground water and make it safe for Human use. (C1,C5)
c3- Improve plan and execute project work including the preparation of descriptive and interpretative technical reports.(C2,C3,C5,C8)
c4- Create and design for a certain system using the subject information given during.(C2,C3,C8)
c5- Improve the designed system to be compatible with Eng. Conditions.(C2,C3,C8)
c6- Apply experimental facilities to investigate the system performance.(pH and water hardness degree).(C2,C3,C5,C8)
c7- Prepare and present technical materials.(Soaps, detergents, and some polymeric samples).(C2)
c8- Observe, record and analyze data in lab. As well as in Field.(Lab Fresh water and underground water).(C5)
c9- Use appropriate tools to measure system performance.(C5)
c10- Present work both in written and oral form.(C12)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Improving own learning and performance, personal skills, working with others.(D1,D2,D3)
d2- Search for information from references, journals and internet.(D3)
d3- Write technical reports and prepare convenient presentations.(D5)
d4- Use the E-mail for communication.(D3,D4,D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A3,A4,A5,A6,A8,A11,A12
B	Intellectual skills	B1,B2,B3,B4,B6,B8,B10,B12
C	Professional and practical skills	C1,C2,C3,C5,C8,C12
D	General and transferable skills	D1,D2,D3,D4,D5,D7

Topic	Lecture hours	Tutorial hours	Practical hours
Gas law and gas liquefaction.	4	2	-
Liquid state, Refrigeration & heat pump.	4	2	-
Electrochemistry &Metallic corrosion.	4	1	-
Solution & Antifreezes.	2	1	-
Thermo chemistry & solar heat, Rocket.	2	1	-
Pollution.	2	1	-
Water treatment and destitution	2	1	10
Polymer and Industry	2	1	-
Fuels and combustion	2	1	-
Chemistry and tech. of petroleum new trends in energy resource.	2	1	-
Industrial detergents chemistry such cement , lubricants , soap	2	1	4
Acid - base titration	-	10	-
Revision and sheets	**2**	**2**	**6**
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1		1					1				1		1	1				
	a2	1			1											1		1	1	1			
	a3	1			1											1		1	1	1			
	a4	1	1	1	1	1	1					1				1		1	1	1			
	a5	1					1									1	1	1	1	1			

	a6	1										1				1			1	1			
Intellectual Skills	b1	1			1											1		1		1			
	b2	1			1	1										1		1	1	1			
	b3	1	1	1	1		1					1				1	1		1				
	b4	1	1		1		1					1				1	1	1	1	1			
	b5	1																					
	b6	1																					
	b7	1																					
	b8	1										**1**				1							
Applied Professional Skills	c1	1	1		1	1	1									1	1	1	1	1			
	c2	1			1											1		1	1	1			
	c3	1		1		1						1	1						1	1			
	c4	1			1	1											1		1	1			
	c5						1										1						
	c6						1										1	1					
	c7																1	1					
	c8																						
	c9																1	1					
	c10																						
General Tran. Skills	d1			1		1						1							1				
	d2		1	1								1	1						1				
	d3	1	1									1							1	1			
	d4	1	1	1								1											

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	8-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		**100**

6- List of references:

6-1 Course notes:

Chemistry for engineering & applied sciences.

6-2 Required books:

W. Steedman, R. B. Snadden, Iain Howe Anderson, (1980) Chemistry for the engineering and applied sciences, Pergamon Press.

6-4 Recommended books: Non

6-4 Periodicals, Web sites, etc

www.seciensedaily.com & www.encyclopedia.com & www.nasa,com
www.science.com

7- Facilities required for teaching and learning:

- Chemistry lab.
- Computer, Data show.
- Computer programs

Course coordinator: Dr. Shaban Ragab Gouda
Head of the Department: Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

PHY 101 : Physics I

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology Department
Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department
Architecture Engineering and Building Technology Department

Department offering the course: Basic Sciences Department.

Date of specifications approval: September 2015

B - Basic information

Title: Physics I. **Code:** PHY101 **Level:** Freshman, First Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

This course will enable the student to have a clear presentation of the basic concepts and principles of fundamental topics in classical physics. Concerning properties of matter, heat and waves.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- the basic principles of rotational motion, application of rotational motion. (A1,A2,A3)

a2- laws of planetary motion derived from the law of gravity and driving a general expression for gravitational potential energy. (A1,A2,A3)

a3- how objects deform under load condition and defining of several elastic constants for different types of deformation. (A1,A2,A3)

a4- fluid in motion and its description by using a model with certain simplifying assumptions. (A1,A2,A4)

a5- Bernoulli's equation and its Application. (A1,A2)

a6- description of thermal phenomena through important terms; temperature, heat & internal energy. (A1 ,A2)

a7- the concept of internal energy and the process by which energy is transferred. (A1 ,A2,A13)

a8- the first law of thermodynamic and some important applications of this law. (A1,A2,A3)

a9- the kinetic theory of gas, entropy and engine efficiency. (A1,A2,A3)

a10- fundamental of wave motion and sound wave. (A1,A2)

B - Intellectual skills

On successful completion of the course, the student 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. (B1,B2,B3)

b2- predict the different laws that governing the motion of the body (Newton's laws, gravity law, and kepler's law). (B1,B2 ,B7)

b3- analyze the characteristics of elastic materials. (B17)

b4- deduce models for fluid flow and analyze some practical situation. (B7,B13)

b5- differentiate and compare the different types of heat transfer in different walls. (B7,B13)

b6- identify the heat system's internal energy changes by an energy transfer or by work done. (B1,B2,B7)

b7- differentiate and compare the different types of waves. (B1,B2,B20).

C - Professional and practical skills

On successful completion of the course, the student should be able to:

c1- analyze physical phenomena and solve problems depending on the gained background and concepts. (C1)

c2- validate the concepts of some of the studied physical phenomena.(C1,C12,C16)

c3- determine different dimensions using vernier calipers, micrometer and spherometer.(C16,C17)

c4- use experimental facilities to measure the acceleration due to gravity and the force constant. (C6,C12,C16,C17)

c5- perform experiments on heat to get practically the specific heat of different materials, the expansion coefficient of a solid, and the viscosity of a viscous liquid.(C1,C16,C17)

c6- determine the velocity of sound in air using resonance tube. (C1,C16,C17)

c7- use experimental facilities to verify the inverse square law of radiation. (C1,C16,C17)

D - General and transferable skills

On successful completion of the course, the student should be able to:

d1. communicate and interact effectively with other people and in a small group.(D1,D3,D5)

d2. use computing and information technology, and synthesize information.(D4,D7,D8)

d3. develop reasoned and scientific arguments.(D2,D6)

d4. manage resources and time, and work within a deadline.(D2,D6)

d5- search for information's in references and in internet. .(D7,D8,D9)

d6- practice self-learning.(D5,D6,D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4, A13
B	Intellectual skills	B1, B2, B3, B7, B17, B20
C	Professional and practical skills	C1, C6, C12, C16, C17
D	General and transferable skills	D1, D2, D3, D4, D5,D6,D7,D8,D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Rotational motion, angular displacement, velocity, acceleration.	2		
➢ Relation between linear and angular quantities.	1	2	4
➢ Applications on rotational motion.	2	1	
➢ Universal gravitational law.	1	1	2
➢ Kepler's laws.	2	1	
➢ Gravitational energy.	1		
➢ Escape speed and orbital energy.	1	1	
➢ Elasticity: Linear, and shear deformation.	1		2
➢ Bulk deformation, and energy stored in a wire.	2	2	4
➢ Characteristics of fluids and stream lines.	1	1	2
➢ Fundamental laws of fluid	2	1	
➢ Applications on Bernoulli's equation.	2	1	2
➢ Viscosity and Poiseulli's law.	1	1	2
➢ Heat transfer by convection.	1		
➢ Heat transfer by conduction.	2	1	2
➢ Work and heat in thermodynamic system.	1		
➢ First law of thermodynamic.	1		
➢ Isothermal expansion of gases and Molar specific heat.	2	1	4
➢ Mathematical representation of waves and speed of transverse waves.	2		2
➢ The principle of superposition.	1		
➢ Standing waves and Sound waves.	2	1	4
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge	a1	1		1	1	1	1					1				1	1	1	1	1			
	a2	1		1	1	1	1					1				1	1	1	1	1			
	a3	1		1	1	1	1					1				1	1	1	1	1			
	a4	1		1	1	1	1					1				1	1	1	1	1			

	a5	1		1	1	1	1					1				1	1	1	1	1			
	a6	1		1	1	1	1					1				1	1	1	1	1			
	a7	1		1	1	1	1					1				1	1	1	1	1			
	a8	1		1	1	1	1					1				1	1	1	1	1			
	a9	1		1	1	1	1					1				1	1	1	1	1			
	a10	1		1	1	1	1					1				1	1	1	1	1			
Intellectual	b1	1		1	1	1	1					1				1	1	1	1	1			
	b2	1		1	1	1	1					1				1	1	1	1	1			
	b3	1		1	1	1	1					1				1	1	1	1	1			
	b4	1		1	1	1	1					1				1	1	1	1	1			
	b5	1		1	1	1	1					1				1	1	1	1	1			
	b6	1		1	1	1	1					1				1	1	1	1	1			
	b7	1		1	1	1	1					1				1	1	1	1	1			
Applied	c1			1	1	1	1					1				1	1	1	1	1			
	c2						1										1			1			
	c3						1										1						
	c4						1										1						
	c5						1										1						
	c6						1										1						
	c7						1										1						
General	d1	1	1	1			1					1											
	d2		1	1		1						1								1			
	d3	1		1		1	1					1							1	1			
	d4					1										1	1	1		1			
	d5			1		1						1							1				
	d6					1						1				1	1	1	1	1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes:

- PHY 101, Physics I.
- Physics Lab (1) Note.

6-2 Required books

Physics for Scientists and Engineers, Raymond A. Serway, Thomson Brooks, 2004; 6th Edition.

6-3 Recommended books:

Halliday, David, Robert Resnick, Jearl Walker. Fundamentals of Physics, 7th ed. Hoboken, N.J.: John Wiley and Sons. 2005.

6-4 Periodicals, Web sites, etc.

- http.www.saunderscollege.cpm/physics
- http://en.wikipedia.org/wiki/Bernoul/principle
- http://www.physicsclassroom.com/calcpad/circgrav/
- http://physicsworld.com/
- http://www.britannica.com/science/wave-motion
- http://physics.info/

7- Facilities required for teaching and learning:

1. Library
2. Computer, Internet, and Data Show
3. Laboratories.

Course coordinator: Dr. Mohamed Eltawab

Head of the Department: Prof. Dr. Laila Soliman
Date: September, 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

PHY 102:Physics 2

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Mechanical Engineering Department
Electrical Engineering Department
Architectural Engineering Department

Department offering the course: Basic Science Department

Date of specifications approval: September, 2015

B - Basic information

Title: Physics 2 **Code:** PHY102 **Level:** First. Semester: Second.

Credit Hours 3 hrs Lectures 2 hrs Tutorial 1 hr Practical 2 hrs

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the fundamental concepts of the electricity and magnetism learn the main laws of electromagnetism, understanding how to connect the actual phenomena with the theory, and learn the fundamentals of physical optics.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Fundamental and basic law of applications in electricity, magnetism and electromagnetism (A1 , A3) .
a2- Gausses law in electricity for different type of charged bodies (A1 , A3).
a3- Laws of electric capacitors and effect of dielectric (A5).
a4- Direct current, resistance and solution of simple electric circuits and kerchief's laws (A5)
a5- Analogy between magnetic field and electric field., and application of Ampere's law, Gausse's law in magnetism (A3) .
a6- Magnetic properties of matter (A3, A5).
a7- Fundamental theories of Electro-magnetic waves and main physical phenomena of physical optics (interference, diffraction and polarization) (A5) .

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Investigate electric force and electric field (using Gauss's law) and select the proper manner to solve problem (B2, B3, B4).
b2- Study of capacitors' and dielectric effect, uses of capacitors, and use Kirchoff's laws to solve simple electric circuits (B3,B4).
b3- Investigate and compare electric field, magnetic field, and magnetic force using Gauss law in magnetism and Ampere's law; studying the nature of each, and identify magnetic properties and studying electromagnetic wave (B3,B4, B5).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Identify ohms law practically, and comparison between two nearly equal resistance by carry-foster bridge (C1, C5,C12).

c2- Determine time constant for (Rc) circuits (C1, C5, C12).

c3- Determine power, focal length for lenses and mirrors (convex and concave) (C1, C5, C12).

c4- Perform a physical experiment (Absorption co-efficient, polarization and Newton's rings) (C1,C5, C12).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Write technical reports(D5)

d2- Use libraries information's in subjects (D7)

d3- search for information's in references and in internet(D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A3, A5
B	Intellectual skills	B2,B3, B4, B5
C	Professional and practical skills	C1, C5, C12
D	General and transferable skills	D5, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Charge and Matter, The Electric Field, Gauss' law	2	1	2
➢ Gauss's law, Electric Potential	2	1	2
➢ Gauss's law applications	2	1	2
➢ Capacitors and Dielectric	2	1	2
➢ Current and Resistance, Electromotive force and Circuits	2	1	2
➢ The Magnetic Field, Ampere's Law	2	1	2
➢ Ampere's law, Inductance	2	1	2
➢ Magnetic Properties of matter	2	1	2
➢ Magnetic Properties of matter, Electromagnetic Waves	2	1	2
➢ Electromagnetic Waves	2	1	2
➢ Electromagnetic Waves, Physical Optics, Polarization of light	2	1	2
➢ Polarization of light	2	1	2
➢ Interference of light	2	1	2
➢ Interference of light, Diffraction of light	2	1	2
➢ Diffraction of light, Some applications	2	1	2
Total hours	**30**	**15**	**30**

4 – Teaching, Learning and Assessment methods:

Course IL O's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1	1	1	1		1	1	1	1	1
	a2	1			1	1				1		1	1	1
	a3	1			1	1	1			1	1	1	1	1
	a4	1			1	1	1			1	1	1	1	1
	a5	1		1	1	1		1		1			1	1
	a6	1		1	1	1		1		1			1	1
	a7	1		1	1	1	1	1		1	1		1	1
Intellectual	b1	**1**			**1**	**1**				1		1	1	**1**
	b2	**1**			**1**	**1**				1		1	1	**1**
	b3	**1**		**1**	**1**			**1**					1	**1**
Applied	c1	1			1		1	1			1		1	1
	c2	1			1	1	1	1			1		1	1
	c3	1			1		1	1			1		1	1
	c4	1			1		1	1			1		1	1
General	d1	1		1		1		1					1	1
	d2			1				1					1	1
	d3			1				1					1	1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

M. El- Tawab Kamal , Abo- Elyzeed B. Abo- Elyzeed, Marwa Yahia Shoeib and Nagat A. Salam Elmahdy, PHY 102- Physics 2

6-2 Required books:

- Halliday, D., Resnick, R., Wallker, J.(1993) Fundamentals of Physics .John Wiley, New York.
- Serway, R. A. (1990) Physics for Scientists and Engineers with Modern Physics, 3rd ed. Wiely, New Yourk.

6-3 Recommended books

M. El- Tawab Kamal , Abo- Elyzeed B. Abo- Elyzeed, Marwa Yahia Shoeib and Nagat A. Salam Elmahdy, PHY 102- Physics 2

6-4 Periodicals, Web sites, etc.

- www.bookstore.org
- http://2020ok.com/14545.htm
- http://booksgoogle.com/

7- Facilities required for teaching and learning:

- Physics Lab.
- Computer, and Data show

Course coordinator: Dr. M El- Tawab Kamal
Head of the Department: Professor Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

MTH 101: Mathematics-1 (Algebra and calculus)

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Mechanical Engineering Department Electrical Engineering Department Architectural Engineering Department
Department offering the course:	Basic Sciences Department
Date of specifications approval:	September, 2015

B - Basic information

Title: Mathematics-1	Code: MTH101	Level: First	Semester: First
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 2	Practical: -
	Pre-requisite: None		

C - Professional information

1 - Course Learning Objectives:

The main objective of this course is to introduce the main concepts of differential calculus, linear algebra, Taylor expansion and binomial expansion and polar coordinates and their applications.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Rules of limits and continuity of functions of one variable. (A1)
a2- Concepts of differentiation. (A1)
a3- Rules of applications of differential calculus used engineering. (A1)
a4- Basic concepts of Taylor expansion and Binomial expansion. (A1)
a5- Basic concepts matrices and matrices algebra. (A1, A2, A5)
a6- Solutions of systems of linear equations. (A1, A5)
a7- Basic concepts of vectors, vector spaces and vector algebra. (A1)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Solve problems on limits, continuity and differentiate all continuous function. (B1, B2)
b2- Use differential calculus to solve applied Engineering Models. (B1, B2, B7)
b3- Apply infinite series, power series, Taylor and Meclaurin series to applications. (B1, B2)
b4- Apply basic concepts of different methods to discuss solutions of linear systems. (B1, B2, B3)
b5- Solve problems on vectors, vector spaces and vector algebra. (B1, B2)

c - Professional and practical skills:
On successful completion of the course, the student should be able to:
c1- Apply differential calculus in mechanics and electronics. (C1, C13)
c2- Use matrices and vectors to solve engineering problems. (C1, C13)

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- Write technical reports. (D3)
d2- Communicate effectively in written form.(D3)
d3- Search for information's in references and in internet. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5
B	Intellectual skills	B1, B2, B3, B7
C	Professional and practical skills	C1, C13
D	General and transferable skills	D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Functions	3	2	
➢ Differentiation	3	4	
➢ Trigonometric and inverse trigonometric functions	4	4	
➢ Exponential and logarithmic functions	2	2	
➢ Hyperbolic and inverse hyperbolic functions	2	2	
➢ Taylor and binomial expansions	2	2	
➢ Matrices with applications	6	6	
➢ Vectors in the Euclidean space	2	2	
➢ Real vector spaces	2	2	
➢ Polar coordinates	2	2	
➢ Final Revision	2	2	
Total hours	30	30	

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods				Assessment Method				
		Lecture	Discussions and seminars	Tutorials	Problem solving			Researches and Reports	Modeling and Simulation			Written Exam	Quizzes	Assignments		
Knowledge & Understanding	a1	1	1	1	1			1				1	1	1		
	a2	1		1	1			1				1	1	1		
	a3	1		1	1			1				1	1	1		
	a4	1		1	1			1				1	1	1		
	a5	1		1	1			1				1	1	1		
	a6	1		1				1	1			1		1		
	a7	1	1	1	1			1	1			1		1		
Intellectual Skills	b1	1		1	1							1	1	1		
	b2	1						1	1			1				
	b3	1	1		1			1				1				
	b4	1		1	1			1				1	1	1		
	b5			1	1							1	1	1		
Applied Professional Skills	c1	1	1						1							
	c2	1	1						1							
General Tran. Skills	d1		1		1			1						1		
	d2		1	1	1			1						1		
	d3	1						1						1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Quizzes, assignments, term paper	Weekly	15
Mid-Term Exam	7-th Week	15
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Algebra and Calculus By Dr. Sameh Alshenawy and Dr. Sabry Abd El-Aziz

6-2 Required books

E. W. Swokoski, "Calculus", 6-th Edition, PWS Publishing Company, Boston, 1994.
R. E. Larson and B. H. Edwards, "Elementary Linear Algebra", 2-nd Edition, DG Heath and Company, Toronto, 1991.

6-3 Recommended books:

E. Kreyszig, Advanced Engineering Mathematics, 8ed, John Willey & Sons, Inc., 1999

6-4 Periodicals, Web sites, etc.

www.mathwords.com
www.17calculus.com
www.sosmath.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Dr. Sabry Abd El-Aziz
Head of the Department: Prof. Dr. Lila Soliman
Date: September, 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

MTH 102: Mathematics-2 (Integration and analytic geometry)

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Mechanical Engineering Department Electrical Engineering Department Architectural Engineering Department
Department offering the course:	Basic Science Department
Date of specifications approval:	September, 2015

B - Basic information

Title: Mathematics - 2	**Code:** MTH102	**Level:** First	**Semester:** Second
Credit Hours: 3	**Lectures:** 2	**Tutorial:** 3	**Practical:** --
	Pre-requisite: MTH 101		

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should be able to apply, demonstrate the knowledge and understanding of the concepts of integral calculus and analytic geometry with their applications.

2 - Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Definition of anti-derivative, indefinite integral, definite integrals.(A1, A5)

a2. Methods of integration (integration by parts, substitution). (A1, A5)

a3. Integration rules of trigonometric functions, integration of rational functions, improper integrals. (A1, A5)

a4. Basic concepts of convergence of infinite sequences and series. (A1, A3)

a5. Equations of lines, planes and conic sections. (A1, A3)

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Investigate the geometric interpretation of the integration. (B1, B2, B3)

b2. Develop techniques for using basic integration formulas to obtain indefinite integrals of complicated functions.(B1, B2, B3, B7)

b3. Explore some of the geometric applications of the definite integral by using it to compute areas between curves, volumes of solids, arc length and surface area. (B1, B2, B3, B4, B7)

b4. Develop several tests to determine whether a series is convergent or divergent without explicitly

finding its sum. (B1, B2, B3, B4, B7)

b5. Estimate of the sum of the convergent series and the error using various methods. (B1, B11)

b6. Derive the equation and main geometric properties of lines, planes and conic sections. (B2, B3, B4)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1. Use integration to evaluate area between curves, volume of solids with known cross sections, arc length. (C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1. Work in a team and involve in group discussion and seminars (D1, D3).

d2. Communicate effectively and present data and results orally and in written form (D3).

d3. Search for information's in references and in internet (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A5
B	Intellectual skills	B1, B2, B3, B4, B7, B11
C	Professional and practical skills	C1, C13
D	General and transferable skills	D1, D3, D7

	Topic	Lecture hours	Tutorial hours
1	Anti-derivative, indefinite integral	2	2
2	Definite integrals and the fundamental theorem of calculus	2	3
3	Methods of integration (integration by parts, substitution)	4	6
4	Integration of trigonometric functions	2	4
5	Trigonometric Substitutions	2	2
6	Integration of rational functions	2	4
7	Miscellaneous Substitutions, improper integrals	2	4
8	Application of definite integral(area, volume, arc length, surface area)	3	4
9	Sequences, series	4	6
10	Equations of lines, planes and circles	3	4
11	Conic sections (parabola, ellipse, hyperbola)	4	6
	Total hours	**30**	**45**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving						Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1		1	1							1				1		1		1			
	a2	1	1		1	1										1		1		1			
	a3	1			1	1										1		1	1	1			
	a4	1		1	1	1						1				1		1	1	1			
	a5	1	1		1	1						1				1		1	1	1			
Intellectual Skills	b1	1			1	1										1		1		1			
	b2	1			1	1										1		1	1	1			
	b3	1	1	1	1	1						1				1			1	1			
	b4	1			1	1										1				1			
	b5	1			1	1										1			1	1			
	b6	1		1	1	1						1				1			1	1			
Applied Professional Skills	c1	1		1	1	1						1				1				1			
General Tran. Skills	d1			1		1						1							1				
	d2		1	1								1							1				
	d3		1	1								1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Quizzes, assignments, term papers	Weekly	15
Mid-Term Exam	7-th Week	15
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

S. Shenawy and S. Abd-elaziz, Integration and Analytic Geometry, Lecture Notes, 2013

6-2 Required books

W. Briggs, L. Cochran and B. Gillett,

E. W. Swokoski, Calculus, 6ed, PWS Publishing Company, Boston, 1994.

P. H. Selby, Analytic Geomatry, Books for Professional, Inc., 1986

6-3 Recommended books:

E. Kreyszig, Advanced Engineering Mathematics, 8ed, John Willey & Sons, Inc., 1999

6-4 Periodicals, Web sites, etc.

www.sosmath.com

www.17calculus.com

www.mathwords.com

7- Facilities required for teaching and learning:

- Library, Required references
- Computer, Internet
- Data show
- Required Computer programs

Course coordinator: Dr. Sabry Abd El-Aziz
Head of the Department: Prof. Dr. Laila Soliman
Date: September, 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

MTH203: Mathematics -3

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology Department
Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department

Department offering the course: asic Science Department

Date of specifications approval: October, 2013

B - Basic information

Title: Mathematics-3 **Code:**MTH203 **Level:** Sophomore, Third Semester

Credit Hours: 3 **Lectures:**2 **Tutorial/Exercise:**3 **Practical: —**

Pre-requisite: MTH102

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should be able to gain and demonstrate the concepts of the ordinary differential equations (O.D.E) and apply the methods to solve the different types of O.D.E. Furthermore, they should be able to investigate the basic concepts of Laplace transform, Fourier series and Legendre and Bessel functions.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Classification of O.D.E. (A1)
a2- Solution of the O.D.E using suitable methods.(A1,A5)
a3- Rules of Laplace transform.(A1,A2,A5)
a4- Rules of inverse Laplace transform. (A1,A2,A5)
a5- Fourier series and its applications in applied engineering problems. (A1,A2,A5)
a6- Basic concepts of Legendre function.(A1,A5)
a7- Basic concepts of Bessel function.(A1,A5)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Choose the suitable methods for solving O.D.E. (B1,B2,B7)
b2-Apply rules of Laplace transform and its inverse to Solve O.D.E and integral equations. (B1, B2,B3,B7)
b3- Make analysis for electrical problem using Fourier series. (B1, B2)
b4- Solve problems on Legendre and Bessel functions(B1,B2).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- apply O.D.E in electrical and mechanical problems. (C1, C13)

c2- apply Laplace transform in electrical and mechanical problem. (C1, C13)

c3- apply Fourier series in electrical and mechanical problem. (C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate effectively with their colleagues. (D3)

d2- Search for information using internet. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5
B	Intellectual skills	B1, B2, B3, B7
C	Professional and practical skills	C1, C13
D	General and transferable skills	D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Definitions, order, degree.	1	1	—
➢ 1st order differential equations, 2nd order and nth order differential equations with constant coefficients.	6	10	—
➢ Non homogeneous D.E., undetermined coefficient method.	6	10	—
➢ Variation of parameters, Euler equations, piratical D.E.	3	4	—
➢ Laplace transform, 1st and 2nd shifting theorem.	4	6	—
➢ Laplace transforms of derivative and integrals, inverse Laplace transforms, convolution, applications.	4	6	—
➢ Fourier series, half rang expansion, Legendre and Bessel functions.	6	8	—
Total hours	**30**	**45**	—

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching methods				Learning Methods	Assessment Method		
		Lecture	Discussions and seminars	Tutorials	Problem solving	Researches and Reports	Written Exam	Quizzes	Assignments
Knowledge	a1	1	1	1	1				1
	a2	1		1	1	1	1	1	1
	a3	1	1	1	1	1	1	1	1

	a4	1	1	1	1	1	1	1	1
	a5	1		1	1		1	1	1
	a6	1	1	1	1		1	1	1
	a7	1	1	1	1		1	1	1
Intellectual	b1	1	1		1		1	1	1
	b2	1		1	1		1	1	1
	b3	1	1	1	1	1	1	1	1
	b4	1			1	1	1	1	1
Applied	c1	1	1			1	1		
	c2	1	1			1	1		
	c3	1	1		1	1	1		
General	d1		1	1		1			1
	d2	1			1	1			1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	8-th Week	20
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Differential Equations and Transforms, .Dr. Aly.M.Essawi and Dr. Ashraf Taha El-SayedTaha

6-2 Required books

- E.Kreyszig, ***Advanced Engineering Mathematics***, 4th ed., John Wiley, New York,1980.
- C.RayWylie.Louis.Barrett, ***Advanced Engineering Mathematics***, 5thed.,McGraw Hill,1996.

6-3 Recommended books:

Non

6-4 Periodicals, Web sites, etc.

www.mathwords.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Dr. Ashraf Taha EL-Sayed
Head of the Department: Prof.Dr. Lila Soliman
Date: August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification
MTH204: Mathematics-4

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Basic Science Department
Date of specifications approval: October, 2013

B - Basic information

Title: Mathematics-4 **Code:** MTH204 **Level:** Sophomore, Fourth Semester
Credit Hours: 3 **Lectures:**2 **Tutorial/Exercise:**3 **Practical: —**
Pre-requisite: MTH101

C - Professional information

1 – Course Learning Objectives:

A study of this course aims to enable the students to gain, learn and apply the basic concepts in functions of two or more independent variables and its partial derivative with applications and to investigate and apply the concepts of double and triple integrals to integrate function of severed variables in different coordinates.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Rules and theories of partial derivatives.(A1,A5)
a2- Rule of double integral.(A1,A5)
a3- Rule of triple integral.(A1,A5)
a4- Basic concepts of cylindrical coordinates.(A1,A5)
a5- Basic concepts of spherical coordinates.(A1,A5)
a6- Uses of vector calculus analysis in applications. (A1)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Apply applications of partial derivatives to Engineering problems.. (B1, B2)
b2-Choose the right decision by choosing the best kind of multiple Integration in applications. (B1, B2,B3)
b3- Use vector analysis to evaluate line integrals and surface integrals for a vector function. (B2)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- apply multiple Integration in electronics. (C1, C13)
c2- apply vector analysis to find the work done by the force field in electrical problem. (C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate effectively using internet. (D3)

d2- Search for information and references on internet. (D7)

Course Contribution in the Program ILO's

		Program ILO's
A	Knowledge and understanding	A1, A5
B	Intellectual skills	B1, B2, B3, B7
C	Professional and practical skills	C1, C13
D	General and transferable skills	D3, D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Functions of several variables	2	3	—
partial derivatives	3	4	—
Directional derivatives	2	3	—
Taylor polynomials	2	3	—
Lagrange multiplier max, and min. of functions	3	4	—
Double integrals	4	6	—
Triple integrals	4	6	—
Polar coordinates, cylindrical coordinates	2	3	—
spherical coordinates	2	3	—
Vector Calculus	3	6	—
Green's theorem, Gauss's and Stocks theorems.	3	4	—
Total hours	**30**	**45**	—

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods				Learning Methods	Assessment Method		
		Lecture	Discussions and seminars	Tutorials	Problem solving	Researches and Reports	Written Exam	Quizzes	Assignments
Knowledge	a1	1	1	1	1				1
	a2	1	1	1	1	1	1	1	1
	a3	1	1	1	1	1	1	1	1

	a4	1		1	1	1	1	1	1
	a5	1		1	1		1	1	1
	a6	1	1	1	1		1	1	1
Intellectual	b1	**1**	**1**		**1**		1	1	1
	b2	**1**	**1**	**1**	**1**		1	1	1
	b3	**1**	**1**	**1**	**1**	**1**	1	1	1
Applied	c1	1	1			1	1		
	c2	1	1			1	1		
General	d1		1	1		1	1		1
	d2	1			1	1	1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	8-th Week	20
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Advanced Calculus, Prof.Dr. A..M.Essawi, Dr. M. Wafaeeand Dr. A. T. El-Sayed

6-2 Required books

C.RayWylie.Louis.Barrett, ***Advanced Engineering Mathematics,***5thed.,McGraw Hill,1996.

6-3 Recommended books:

None

6-4 Periodicals, Web sites, etc.

www.mathwords.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Dr. Ashraf Taha EL-Sayed

Head of the Department: Prof.Dr. Lila Soliman

Date: August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification
MTH 305: Mathematics-5

A- Affiliation

Relevant program: Computer Engineering and Information Technology BSc Program
Electronic Engineering and Communication Technology BSc Program

Department offering the program: Computer Engineering and Information Technology Department
Electronic Engineering and Communication Technology Department

Department offering the course: asic Sciences Department

Date of specifications approval: June, 2013

B - Basic information

Title: Mathematics-5 **Code:** MTH 305 **Level:** Fifth Semester (Junior)

Credit Hours:2 **Lectures:1** **Tutorial/Exercise:3** **Practical:** -

Pre-requisite: 102

C - Professional information

1 - Course Learning Objectives:

The main objective of this course is to enable the student to gain, investigate and learn the main concepts of introduction sample space, axioms of probability, conditional probability Bay's theorem, discrete and continuous distributions, random variables, binomial distribution, normal distribution, cumulative distribution and standard normal distribution, statistics, measure of location (sample mean), median and mode, measures of variations.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Rules of axioms of probability.(A1, A2).

a2- Rules of addition probability, multiplication probability and conditional probability. (A1, A2).

a3- Rules of discrete and continuous distributions.(A1, A5)

a4- Basic concepts Statistics, measure of location (sample mean), median and mode, measures of variations.(A1, A5)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Solve problems on addition probability, multiplication probability and conditional probability.(B1, B2)

b2-Useto solve applied Engineering Models.(B1, B2, B7)

b3-Apply random variables, binomial distribution, normal distribution, cumulative distribution and standard normal distribution to applications. (B1, B2)

b4- Apply basic concepts of statistics, measure of location (sample mean), median and mode, measures of variations to analyze results of numerical models and assess their limitations. (B1, B2, B3, B11)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- apply probability and statistics methods to engineering problems(C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Write technical reports.(D3)

d2- Communicate effectively in written form.(D3).

d3- Search for information's in references and in internet (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5
B	Intellectual skills	B1, B2, B3, B7,B11
C	Professional and practical skills	C1, C13
D	General and transferable skills	D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Introduction, Sample space, Axioms of probability	2	6	
➢ Conditional probability Bay's theorem	2	6	
➢ Random variables.	1	3	
➢ Binomial distribution.	2	6	
➢ Normal distribution.	1	3	
➢ Cumulative distribution.	1	3	
➢ Standard normal distribution.	1	3	
➢ Introduction to Statistics, measure of location (sample mean)	2	6	
➢ Median and mode.	1	3	
➢ Measures of variations	2	6	
Total hours	**15**	**45**	

Course ILO's		Teaching Methods						Learning Methods				Assessment Method			
		Lecture	Discussions and seminars	Tutorials	Problem solving			Researches and Reports	Modeling and Simulation			Written Exam	Quizzes	Assignments	
Knowledge & Understanding	a1	1	1	1	1			1				1	1	1	
	a2	1		1	1			1				1	1	1	
	a3	1		1	1			1				1	1	1	
	a4	1	1	1	1			1	1			1	1	1	
	a5	1	1	1	1			1	1			1	1	1	

	a6	1	1	1	1			1	1			1	1	1	
Intellectual Skills	b1	1		1	1							1	1	1	
	b2	1						1	1			1			
	b3	1	1		1			1				1			
	b4	1		1	1			1				1	1	1	
	b5	1		1				1				1			
Applied Professional Skills	c1	1	1						1			1			
General Tran. Skills	d1		1		1			1						1	
	d2	1	1	1	1			1						1	
	d3	1						1						1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: quizzes and assignments	Bi-Weekly	15
Mid-Term Exam	8-th Week	15
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Probability and Statistics, Dr. Osama El-Gayar

6-2 Required books

- C. Ray Wylie Louis C. Barrett ,***Advanced Engineering Mathematics***,"5th ed., McGraw Hill International ed.,1996.
- Allan J., ***Mathematics for Engineers and Scientists***, 3rd ed., Billing Ltd.(UK),1985.

6-3 Recommended books:

None

6-4 Periodicals, Web sites, etc.

www.mathwords.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Dr. Osama El-Gayar
Head of the Department: Dr. Lila Soliman
Date: August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification
MTH 306: Mathematics-6

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Basic Science Department

Date of specifications approval: October, 2012

B - Basic information

Title: Mathematics-6 **Code:**MTH306 **Level:** Junior, Sixth Semester

Credit Hours: 2 **Lectures:**1 **Tutorial/Exercise:**3 **Practical:** --

Pre-requisite: MTH 102

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should be able to demonstrate and apply the knowledge and understanding of the concepts of partial differential equations, wave equation, heat equation Laplace equation by their solutions by different methods with their applications and learn complex analysis with their application.

2 - Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1.Comlex numbers, D'Moiver theorem, complex and analytic functions.(A1, A5)
a2. Conformal mappings and bilinear transformation. (A1, A5)
a3. Power series and integration by integration by methods of residues. (A1, A5)
a4. Basic concepts, classification, and canonical form of PDEs. (A1, A3)
a5 .Method of separation of variables for heat, wave and Laplace equations. (A1, A3)
a6. Solution of PDEs using Laplace trans form. (A1, A3)

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Investigate D'Moiver theorem, complex and analytic functions.(B1, B2, B3)
b2. Explore and recognize conformal mappings and bilinear transformation.(B1, B2, B3, B7)
b3. Expand and integrate complex functions using different methods.(B1, B2, B3, B4, B7)
b4. Develop several methods for solving PDEs. (B1, B2, B3, B4, B7)
b5. Apply the method of separation of variables to solve heat, wave and Laplace equations. (B1, B3, B4)
b6. Solve PDEs using Laplace transform. (B2, B3, B4)

c - Professional and practical skills:

c1. Solve partial differential equations describing real systems(C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1. Work in a team and involve in group discussion and seminars(D1, D3).

d2. Communicate effectively and present data and results orally and in written form(D3).
d3.Search for information's in references and in internet(D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5
B	Intellectual skills	B1, B2, B3, B4, B7
C	Professional and practical skills	C1, C13
D	General and transferable skills	D1, D3, D7

3 – Contents:

	Topic	Lecture hours	Tutorial hours
1	Complex numbers, arithmetic operations, polar forms	1	3
2	D'Moiver theorem, complex functions. Analytic function	1	3
3	Elementary functions of complex variables	1	3
4	Mapping, and conformal mapping.	1	3
5	Bilinear transformation, complex integrals.	1	3
6	Power series (Taylor and Laurent series).	1	3
7	Integration by method of residues.	1	3
8	Introduction to PDEs, Basic concepts of PDEs	1	3
9	Classifications and conical forms of 2nd order linear PDEs.	1	3
10	Method of separation of variables for heat equation.	2	6
11	Wave and Laplace equations. D'Alembert solution of wave equation.	2	6
12	Solution of PDEs using Laplace transforms.	2	6
	Total hours	**15**	**45**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving						Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1		1	1							1				1		1		1			
	a2	1	1		1	1										1		1		1			
	a3	1			1	1										1		1	1	1			
	a4	1		1	1	1						1				1		1	1	1			
	a5	1	1		1	1						1				1		1	1	1			
	a6	1										1				1		1		1			

Intellectual Skills	b1	1			1	1									1		1		1			
	b2	1			1	1									1		1	1	1			
	b3	1	1	1	1	1					1				1			1	1			
	b4	1			1	1									1				1			
	b5	1			1	1									1			1	1			
	b6	1		1	1	1					1				1			1	1			
Applied Professional Skills	C1	1		1		1					1				1			1	1			
General Tran. Skills	d1			1		1					1							1				
	d2		1	1							1							1				
	d3		1	1							1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Quizzes, assignments, term papers	Weekly	15
Mid-Term Exam	6-th Week	15
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Non

6-2 Required books

E. Kreyszig, ***Advanced Engineering Mathematics***, 8ed, John Willey & Sons, Inc., 1999

6-3 Recommended books:

E. Kreyszig, ***Advanced Engineering Mathematics***, 8ed, John Willey & Sons, Inc., 1999

6-4 Periodicals, Web sites, etc.

www.sosmath.com

7- Facilities required for teaching and learning:

- Library, Required references
- Computer, Internet
- Data show
- Required Computer programs

Course coordinator: Dr. S. Shenawy
Head of the Department: Dr. Laila Soliman
Date: August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

MEC 101: Mechanics-1

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Mechanical Engineering Department
Electrical Engineering Department
Architectural Engineering Department

Department offering the course: Basic Science Department

Date of specifications approval: September, 2015

B - Basic information

Title: Mechanics-1 **Code:** MEC 101 **Level:** Senior 2. Semester: Second.

Hours Credit/Total 3 hrs Lectures 2 hrs Tutorial 2 hrs Practical non

C - Professional information

1 – Course Learning Objectives:

A study of this course will introduce the basic concepts of statics in plane and space: (force resultant equilibrium analysis of structures).

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- knowledge of the basic of statics in plane and space(A1,A2).

a2- knowledge the difference between the moment of force in plane and space(A2,A4).

a3- classification the support reaction in plane and in space(A1,A2).

a4- understanding the structural analysis in plane(A3,A4).

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- analyze and classify between equilibrium in plane and equilibrium in space(B1, B2).

b2- classify and compare the different between equilibrium of a single rigid body and all forces involved were external to the rigid body(B1,B2) .

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- solve the equations of equilibrium to get three unknowns (C1,C13).

c2- solve the trusses to get the value of the forces in the structural by joints and by section methods (C1,C13).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1-work in a team to solve problem as a search (D1).

d2- search for information in references and in internet(D2)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4
B	Intellectual skills	B1, B2
C	Professional and practical skills	C1,C13
D	General and transferable skills	D1, D2

3 – Contents

Topic	Lecture hours	Tutorial hours
➢ Basic Concepts of statics.	1	2
➢ Resultant of concurrent forces in plane	1	3
➢ Resultant of concurrent forces in space	1	4
➢ Equilibrium of a particle (in plane and in space)	2	4
➢ Different types of support in plane	1	3
➢ Distributed loads	1	3
➢ Equilibrium of rigid body in plane	1	2
➢ Different types of supports in space	1	4
➢ Equilibrium of rigid body in space	2	4
➢ Special cases of two, three and four force members	1	4
➢ Analysis of Trusses by the method of joints	1	4
➢ Analysis of Trusses by the method of section	1	4
➢ Final revision	1	4
Total hours	**15**	**45**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge	a1	1			1	1						1				1		1	1	1			
	a2	1			1	1										1		1	1	1			
	a3	1			1	1						1				1		1	1	1			
	a4	1			1	1						1				1		1	1	1			
Intellectual	b1	**1**			**1**											1		1		**1**			
	b2	**1**			**1**	**1**										1		1	**1**	**1**			

Applied	c1	1			1	1									1		1	1	1			
	c2	1			1										1		1	1	1			
General	d1					1					1							1				
	d2										1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Written Exam	Fifteen week	70
	Total	100

6- List of references:

6-1 Course notes: found

6-2 Required books : Beer and Johnston, Vector Mechanics for Engineers- Statics, 8th Edition in SI Units, ISBN 978-007-125765-7, U.S.A., 2007)

6-2 Recommended books

Beer and Johnston, Vector Mechanics for Engineers- Statics, 8th Edition in SI Units, ISBN 978-007-125765-7, U.S.A., 2007.

6-4 Periodicals, Web sites, etc.

Basic of mechanical engineering, enginerring mechanics statics and dynamics, statics and dynamics hibbeler 12th edition.

Course coordinator: Professor Dr Hassan Awad
Head of the Department: Dr Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification
MEC 102: Mechanics-2

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Mechanical Engineering Department
Electrical Engineering Department
Architectural Engineering Department

Department offering the course: Basic Science Department

Date of specifications approval: September, 2015

B - Basic information

Title: Mechanics-2 **Code:** MEC 102 **Level:** First/Second. Semester: First / Second

Hours Credit/Total 3 hrs Lectures 2 hrs Tutorial 2 hrs

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding the geometry of motion to relate displacement, velocity, acceleration and time without reference to the cause of the motion. The study of the relation existing between the forces acting on a body to determine the forces required to produce a given motion. The end of this course the students should demonstrate the knowledge that the equation of motion together with the principle of kinetics to obtain the two additional methods of analysis the method of the work and energy and the method of impulse and momentum.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- basic of dynamics like velocity, acceleration, total distance, average velocity and average speed(A1, A2).
a2- definition of differentiation and integration (A1)
a3- classification the particle's motion in straight line and in curved path and it's applications (A3,A5)
a4- understanding the dynamics system and the effect of forces on the system in different coordinates (A5).
a5- classification of two methods of kinetics, namely, the method of work and energy and method of impulse and momentum. (A4, A5)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- analyze and classify between the force acting on the system to get it's value and the principle of work and energy to get the velocity of the particle (B1, B2)
b2- classify and compare the different between the average velocity and average speed (B5, B13).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- solve the equation of motion to get velocity, acceleration and total distance traveled at any time. (C1,C13)

c2- calculate the time of flight of projectile to get a target. (C1, C13).

c3- solve the equation of motion graphically. (C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- work in a team to solve problem as a search.(D1,D2)

d2- search for information in references and in internet (D2).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A5
B	Intellectual skills	B1, B2, B5, B13, B15
C	Professional and practical skills	C1, C13
D	General and transferable skills	D1, D2

3 – Contents

Topic	Lecture hours	Tutorial hours
➢ Rectilinear Motion of particles.	1	4
➢ Determination of the motion of a particle.	1	4
➢ Graphical Solution of Rectilinear Motion.	1	4
➢ Curvilinear Motion of particle, Free Flight Motion.	2	4
➢ Curvilinear Motion of particle:		
➢ Normal and Tangential.	1	4
➢ Plane Curvilinear Motion.	1	4
➢ Polar Coordinates.	1	4
➢ Kinetics of Particles, Force and acceleration.	2	4
➢ Kinetics of Particles Energy and Momentum Methods	2	4
➢ Motion under a conservative central force.	1	4
➢ Principle of Impulse and Momentum for particle.	2	5
Total hours	**15**	**45**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge	a1	1			1	1						1				1		1	1	1			
	a2	1			1	1										1		1	1	1			
	a3	1			1	1						1				1		1	1	1			
	a4	1			1	1						1				1		1	1	1			
	a5	1			1											1		1	1	1			
Intellectual	b1	**1**			**1**											1		1		**1**			
	b2	**1**			**1**	**1**										1		1	**1**	**1**			
Applied	c1	1			1	1										1		1	1	1			
	c2	1			1											1		1	1	1			
	c3	1			1	1													1	1			
General	d1					1						1							1				
	d2											1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes: Found

6-2 Required books:

F. Beer and Johnston Vector mechanics for Engineers, Dynamics, McGraw-Hill.

R.C. Hibbeler Engineering mechanics, Dynamics.

6-3 Recommended books:
Basic of mechanical engineering, enginerring mechanics statics and dynamics, statics and dynamics hibbeler 12th edition.

6-4 Periodicals, Web sites, etc.

Course coordinator:	Professor Dr Hassan Awad
Head of the Department:	Dr Laila Soliman
Date:	September 2015

Modern Academy for Engineering & Technology
Basic Science Department
Course Specification
GEN 141: Contemporary Social Issues

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the course: Basic science department
Date of specifications approval: September 2015

B - Basic information

Title Contemporary Social Issues: **Code: GEN 141** **Level:** freshman, First Semester

Credit Hours: 2 **Lectures:** 2 **Tutorial/Exercise:** - **Practical:** -
Pre-requisite: non

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should be able to gain and analyze and apply the knowledge and understanding of

الانتماءوأهميته وأصول المجتمع وبناء الأسرة و تكوينها والمكونات الاجتماعية والاقتصادية للمجتمع وأساليب القيادة وكذلك أساليب ترشيد الموارد وتجديدها و أساليب تقييم المشروعات وكذلك مهارات العمل الجماعي وأهمية الفارق بين العمل الجماعي والفريقى و كيفية إعداد القادة و كذلك الضغوط والمؤثرات المعوقة والنظريات المفسرة للعمل الفريقى.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- الانتماء و أهميته و أصول المجتمع و العادات والتقاليد المرعية (A9, A10)
a2- بناء الأسرة و تكوينها و التنشئة الاجتماعية (A9, A10)
a3- العمل الجماعي و أهمية عمل الفريق و الفارق بين العمل الجماعي والفريقى و كيفية إعداد القادة (A9, A10)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- ان يتعلم الطالب مفهوم الانتماء والعادات والتقاليد واصول المجتمع (B4, B9, B12)
b2- ان يدرك الطالب علي اهمية الاسره والتنشئه الاجتماعيه (B4, B9)
b3- ان يتعلم مهارات العمل الجماعي واهمية عمل الفريق والفرق بين العمل الجماعي والفردي (B4, B12)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- أن يمارس الطالب مهارات العمل الجماعى والفردى خلال الدراسة.(C1,C5)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion and seminars (D1, D3).

d2- Search for information's in references and in internet (D7).

d3- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A9, A10
B	Intellectual Skills	B4, B9, B12
C	Professional and practical skills	C1, C5
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
الانتماء: أهميته - أصول المجتمع - العادات والتقاليد المرعية – المواطنة - العوامل المحفزة لحب الوطن (الحرية - احترام الرأي الآخر - عدم التمييز العنصري - الديمقراطية).	6		
النمو والتكامل الاقتصادي: المكونات الاجتماعية والاقتصادية للمجتمع- أساليب القيادة - أساليب ترشيد الموارد - الابتكار وتجديد الموارد - الحوافز الخاصة بأفراد المجتمع - أساليب تقييم المشروعات).	10		
بناء الأسرة: تكوين الأسرة - التنشئة الاجتماعية - النسق الأسرى والأنساق الأخرى - المؤسسات التقليدية والحديثة الخاصة بالأسرة).	6		
مهارات العمل الجماعي : أهمية عمل الفريق-الفارق بين العمل الجماعي والفريقى – كيفية إعداد القادة	4		
الضغوط والمؤثرات المعوقة-النظريات المفسرة للعمل الفريقى.	4		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1								1				1		1					
	a2	1				1										1		1		1			
	a3	1														1		1		1			
Intellectual Skills	b1	**1**														1		1		**1**			
	b2	**1**				**1**										1		1		**1**			
	b3	**1**	**1**	**1**								**1**				1							

General Tran. Skills	d1	1		1		1						1											
	d2	1	1	1																			
	d3	1	1																	1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
quizzes assignments	Bi-Weekly	15
Mid-Term Exam	6-th Week	15
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes: قضايا اجتماعية معاصرة (٢٠١٥).

6-2 Required books

Nasef, S. (2007)"Contemporary Social Issues"

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.: Google search

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs

Course coordinator: Dr. Shimaa Nabih Ebrahim Esmail
Head of the Department: Professor Dr Laila Solaiman
Date: September 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

GEN 142: English Language

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the course: Basic Sciences Department
Date of specifications approval: September, 2015

B - Basic information

Title: English Language **Code:**GEN142 **Level:** 1ST. Year, 1ST Semester
Credit Hours: 2 **Lectures:**2 **Tutorial:** **Practical:**
Pre-requisite: -

C - Professional information

1 – Course Learning Objectives:

This course is designed for students of the pre-intermediate to upper-intermediate level of English. The course aims at developing students' reading, writing, speaking and listening skills with regard to the related topics. It is also designed to consolidate and extend Students' knowledge of situations of every day life. The course offers realistic and informative original situations introducing students to key concepts of different topics.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1) Identifying the most frequent words, phrases and grammar rules in everyday conversation. (A9), (A10)
a2) how to communicate effectively, even at the very beginning levels. (A9), (A10)
a3) how to differentiate between tenses. (A9)

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1) Enhance class interaction in terms of speaking, reading, listening and writing. (B4)
b2) Personalize the learning experience by offering students interesting topics relevant to their interests and experiences. (B4)
b3) Employ tasks which encourage students to take an active role in learning and using new vocabulary. (B4)
b4) Use different tenses in conversation. (B4)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c 1) Write paragraphs and peer edit them using error detection. (C12)
c 2) communicate with each other and with the professor. (C11)
c 3) Use different tenses in conversation. (C11)
c 4) Brainstorm ideas for homework writing. (C12)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion. (D1), (D2), (D3)
d2- Communicate effectively and present data and results orally and in written form. (D1), (D2), (D3), (D6)
d3- communicate effectively in written and oral forms.(D3), (D7)
d4- Search for information's in references and in internet. (D4), (D7)
d5- Practice self-learning. (D4), (D7), (D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A9, A10
B	Intellectual skills	B4
C	Professional and practical skills	C11, C12
D	General and transferable skills	D1, D2, D3, D4, D6, D7, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Computer Hackers	2		
At the Doctor's Reviewing tenses Reading	2		
At the Doctor's(to be continued) Grammar: perfect tenses& prefixes	2		
Global Warming Reading Speaking : English communication skills Suffixes & adj.&adv.	2		
Computer Addiction Reading: 53-55 Seaking: discussing the topic Grammar: adjectives	2		
Earthquake Reading: 59-61 Grammar: Suffixes	2		
Words and their Stories Reading Grammar: wh-questions and negatives	2		
Revision **7th week Exam**	2		
Describing People &Things	2		

Reading : **Grammar:** adj.& adv			
Describing People &Things (to be contiued) **Reading :** **Grammar : relative clauses**	2		
Qualities and Flaws Speak**:** dicussing qualities and flaws of each one (pair work **Grammar:** Possession Pronouns+ Adjectives	2		
Qualities and Flaws (to be continued) **List. & Speak:**dicussing the topic	2		
People Idioms **Grammar:**gerund "& to infinitive & adjectives with prepositions	2		
English proverbs **Grammar: problem verbs**	2		
Revision	2		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Warming up	Discussions	Tutorials	Problem solving						Researches and Reports	Modeling and Simulation			Written Exam	Class work	Quizzes	Class participation	Assignments			
Knowledge & Understanding	a1	1	1	1								1				1	1	1	1	1			
	a2	1	1	1								1				1	1	1	1	1			
	a3	1	1	1								1				1	1	1	1	1			
Intellectual Skills	b1	1	1	1								1				1	1	1	1	1			
	b2	1	1	1								1				1	1	1	1	1			
	b3	1	1	1								1				1	1		1	1			
	b4	1	1	1								1				1	1	1	1	1			
Applied Professional Skills	c1	1	1	1								1				1	1	1	1	1			
	c2	1	1	1								1				1	1	1	1	1			
	c3	1	1	1								1				1	1	1	1	1			
	c4	1	1	1								1				1	1	1	1	1			

General Tran. Skills	d1	1	1	1								1				1			1				
	d2		1	1								1							1				
	d3	1	1	1								1							1	1			
	d4	1	1	1								1											
	d5											1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: quizzes, assignments and class participation	Bi-Weekly	20
Mid-Term Exam	7-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

The English Language Book by Dr Neveen Samir , 2015

6-2 Required books

Shelton, James, Handbook for technical writing, NTC publishing Group, Illinois, USA, 1998.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.:

- http://www.bbc.co.uk/learningenglish
- http://www.rong-chang.com
- http://legacy.australianetwork.com/studyenglish

7- Facilities required for teaching and learning:

Library and Internet

Course coordinator: Dr. Neveen Samir
Head of the Department: Prof. Layla Solaiman
Date: Sept., 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

GEN143: History of science and Technology

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic science department
Date of specifications approval:	October, 2013

B - Basic information

Title:: History of science and Technology **Code:**GEN143 **Level:** Level 1 , First semester
Credit Hours: 2 **Lectures:**2 **Tutorial/Exercise:** 0 **Practical:** 0
Pre-requisite: --

C - Professional information

1 – Course Learning Objectives:

يهدف هذا المقرر الى اكساب الطالب المعارف والمهارات التى تمكنه من فهم تاريخ الهندسة والتكنولوجيا فى مختلف العصور والفرق بين كل من العلم و الهندسه و التكنولوجيا – نقل التكنولوجيا – نشاطات العمل الهندسى ومسئوليات المهندس- امثله عن تطور اوجه النشاط الهندسى والتكنولوجى وكذا اشهر علماء الهندسه كنماذج يحتذى بها.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- مفهوم العلم و الهندسه و التكنولوجيا و علاقتهم ببعضهم البعض و كيفيه ابتكار معدات و منظومات تحقق احتياجات المجتمع (A1, A11, A14,) طبقا لتلك المفاهيم,

a2- المعلومات التاريخيه عن مهنه الهندسه والتكنولوجيا وكذا العلاقه بين مسمى المعهد او الكليه وبين ما يتم دراسته (A9, A1)

a3 مفهوم التعليم الهندسى ومجالات العمل للمهندسين وكيفيه القيد والتسجيل بنقابه المهندسين وكذا حقوق وواجبات المهندس (A9, A1)

a4- تطور اوجه النشاط الهندسى و التكنولوجى وايضا التعرف علي الطرق المختلفة لنقلالتكنولوجيا (A8, A5)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- ان يكتسب الطالب مهارات توظيف النظريات و المعارف و البيانات و الافكار لابتكار معدات و منظومات متطورة (B1, B2)

b2- ان يستخدم الطالب المنهج العلمى في التفكير وصولا للتصميم و تركيب الفروض (B2)

b3- ان يستطيع الطالب التفكيرفي حل مشكله ما من خلال تفهمه لموضوعات الهندسه العكسيه (B7)

b4- ان يستطيع الطالب اتخاذ القرار السليم واختيار انسب الحلول من خلال دراسته لنماذج وامثله من المشاكل الهندسيه وعرض الحلول الممكنه لها. (B6)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- ان يتمكن الطالب من توظيف المعلومات التاريخية والمعرفية فى الابتكارات الهندسية (C1,C5)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- الماما الطالب بمعايير الجوده ونظم الامان فى استخدام المنظومات الهندسيه D1

d2- تدريب الطالب على التفكير وايجاد التصميمات اللازمه لخلق كل ماهو جديد D7, D8

d3- اكساب الطالب الخبره فى ايجاد حلول عمليه تخدم برامج خارج تخصصيه D7

d4- اكساب الطالب كيفيه وضع المعايير اللازمه لتكوين فريق بحثى متكامل قادر على وضع تصميم لمنظومه علميه جديده او ايجاد تصميم لتعديل وتطوير منظومه علميه بما يتلاءم مجتمعنا D1.

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A5,A8,A9,A11,A14
B	Intellectual skills	B1, B2. B6, B7.
C	Professional and Practical Skills	C1, C5
D	General and transferable skills	D1,D7, D8.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
العلم والهندسه والتكنولوجيا	2		
الهندسه والبحث العلمى – منظومه البحث العلمى	2		
عناصر ومتطلبات البحث العلمى	2		
الهندسه وخريطه البحث اللعمى – مراحل البحث العلمى	2		
تاريخ الهندسه والتكنولوجيا فى مختلف العصور	4		
نقل التكنولوجيا	2		
نشاطات العمل الهندسى ومسئوليات المهندس	2		
التعليم الهندسى	2		
نقابه المهندسين المصريه – جمعيه المهندسين المصريه	4		
تطور اوجه النشاط الهندسى والتكنولوجى	4		
اشهر علماء الهندسه والتكنولوجيا	2		
مراجعه عامة	2		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1									1						1	1	1			
	a2	1	1	1								1				1		1		1			
	a3	1	1									1				1		1	1	1			
	a4	1	1	1								1				1		1		1			
Intellectual Skills	b1	1	1									1				1		1		1			
	b2	1	1									1				1		1		1			
	b3	1	1									1				1		1		1			
	b4	1	1									1				1							
General Tran. Skills	d1		1	1								1											
	d2		1	1								1											
	d3		1	1								1											
	d4		1	1								1											

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	15
Mid-Term Exam	6-th Week	15
Written Exam	Sixteenth week	70
Total		100

6- List of references:

تاريخ العلوم والتكنولوجياالهندسية المولف احمد علي العريان الناشر عالم الكتب رقم تسلسلي عالمي .8-090-232-997

6-1 Course notes:

None

6-2 Required books:

None

7- Facilities required for teaching and learning:

Data show – computer

Course coordinator: ادا/ شعبان رجب

Head of the Department: ا. د/ ليلى ابراهيم سليمان

Date: August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification
GEN241: Presentation Skills

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic Sciences Department.
Academic level:	Sophomore
Date of specifications approval:	October, 2013

B - Basic information

Title: Presentation Skills **Code:** GEN241 **Level:** Sophomore ,Third semester

Credit Hours: 2 **Lectures:** 2 **Tutorial:**-

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

This is a public speaking course that requires the student to combine both written knowledge with oral performance criteria. The course gives practical advice on the different modes of communication, including formal writing, CV writing, body language, art of listening, leadership, speeches, negotiation and face-to-face interactions, and examines how to design and deliver an effective presentation. Students will become more confident and less fearful, more skillful and less clumsy, more understanding of others and less threatened by them. Students will practice different modes of communication, and examine how to design and deliver an effective attractive presentation.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Topics related to humanitarian interests and moral issues (A9)

a2- Technical language and report writing (A10)

a3- Contemporary engineering topics (A12)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Plan, conduct and write a report on a project or assignment. (B14)

C-Practical and Professional Skills:

On successful completion of the course, the student should be able to

c1-Prepare and present technical reports. (C11)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Collaborate effectively within multidisciplinary team (D1)
d2-Work in stressful environment and within constraints (D2)
d3-Communicate effectively (D3)
d4- Lead and motivate individuals (D5)
d5- Search for information and adopt life-long self learning (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A9, A10, A12
B	Intellectual skills	B14
C	Professional and practical skills	C11
D	General and transferable skills	D1, D2, D3, D5, D7

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1- Preparation of short talks.	2		
2-Fundamentals of preparing an attractive style for a short talk, techniques for using slides and projector for better interpretation. Using the power point technique for achieving and ideal short talk through a lab top and a data show / Seminar training.	6		
2- To improve the student communications skills / Seminar training	6		
3- To develop the student acquiring power of leadership	2		
4-. Training on active listening and negotiation.	4		
5- To understand and practice what's body language.	2		
6- How to write a technical report.	2		
7- C.V Writing	2		
8- Preparation of an attractive C.V. containing personal data qualifications, posts, and publications. - Interview Preparations.	2		
Total hours	**28**		

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	X	X											X	
	a2	X								X			X		
	a3		X	X											
Intellectual Skills	b1	X	X	X				X	X	X			X	X	
Applied Professional Skills															
General Tran. Skills	d1		X	X				X		X	X				
	d2		X	X										X	
	d3		X	X				X						X	
	d4		X	X				X						X	
	d5	X	X							X	X		X	X	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, assignments and reports	All over session	18
Midterm	7th week	12
Written Exam	16th week	70
Total		100

6- List of references:

6-1 Course notes

Presentation and Communication Skills "*Theoretical part*"

6-2 Required books

Anderson, Paul, ***Technical Communication: A Reader-Centered Approach***, 5th. Edition MacMillan Publishing., 2003.

6-3 Recommended books

1. Strunck, William, Jr.; and white, E. B., ***The Elements of style***, 3rd edition", MacMillan Co., 2000
2. Gerson Sharon J. and Gerson Steven M., ***Technical Communication Process and Product***, 7th edition, Prentice Hall, 2012.
3. Riordan Daniel G. ***Technical Report Writing Today,*** 9th edition", Houghton Mifflin, 2005.
4. Stephen Lucas, ***The Art of Public Speaking***, 9th edition, McGraw Hill. 2007.
5. Julius Fast, ***Body Language***, MJF books, 1970.

7- Facilities required for teaching and learning:

Lectures room equipped with and data show facility.

Course coordinator:	Dr. Lubna Fekry
Head of the Department:	Prof. Dr. Mokhtar Abd El- Haleem
Date:	August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

GEN 242: Technical Report Writing

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology Department
Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department
Architecture Engineering and Building Technology Department

Department offering the course: Manufacturing Engineering and Production Technology Department

Date of specifications approval: October, 2012

B - Basic information

Title: Technical Report Writing **Code:** GEN 242 **Level:** junior, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**2 **Practical: -**
Pre-requisite: NON

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to enable the students to introduce the basic concepts of writing technical reports, resume's, CVs and research papers.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

By the end of the course the student should gain the following knowledge:
a1- Different rhetorical models of writing.[A10]
a2- The art of communicating information.[A11]
a3- Implementation of information and communication technology in his future job.[A11]
b4- Methods of analyzing the engineering data.[A4]
b5- The art of writing report of projects and experiments.[A4]

b - Intellectual skills:

By the end of the course the student should be able to:
b1- Develop clear understanding of the effects of word choice, sentence structure, organization and document design on the meaning and effectiveness of documents.[B4]
b2- Recognize the elements of technical reports.[B4]
b3- Appreciate the methods of engineering writing.[B4]
b4- Use the correct expressions and analytical reading.[B4]

c - Professional and practical skills:

By the end of the course the student should be able to:
c1- Use the technical writing tools. [C2, C12]

c2- Interact professionally with other writers and their writing.[C2, C12]
c3- communicate effectively his knowledge and scientific findings with other people. [C2, C12]

d - General and transferable skills:
By the end of the course the student should be able to:
d1- Perform report and manual writing.[D6]
d2- Present findings of scientific research in seminars and workshops.[D8]
d3- Collaborative effectively with the group work and publishing strategies.[D6], [D8]

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A 4, A10, A11
B	Intellectual skills	B4
C	Professional and practical skills	C2, C12
D	General and transferable skills	D3, D4, D7, D9

3 – Contents

	Lecture hours	Tutorial hours	Practical hours
• Introduction: Paper Presentation	2	2	-
• Steps to a Successful Writing Assignment	2	2	-
• The Writing Process	2	2	-
• Mechanics	4	4	-
• Research Papers and Reports	2	2	-
• Technical Report Writing	4	4	-
• Resumes and Cover Letters	2	2	-
• Using Words Correctly	2	2	-
• Report and Thesis Layout	2	2	-
• Technical Writing Ethics	2	2	-
• A Structured Approach to Presenting Postgraduate Research Theses	2	2	-
• Publishing from the thesis	2	2	-
• Writing a research paper (Isn't it a bit early)	2	2	-
Total Hours	30	**30**	-

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving						Researches and Reports	Modeling and Simulation			Written Exam		Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1							1				1		1	1				
	a2	1			1											1		1	1	1			
	a3	1			1											1		1	1	1			
	a4	1	1	1	1	1						1				1		1	1	1			
	a5	1														1		1	1	1			
	a6	1										1							1	1			
	a7	1		1	1	1						1							1				
Intellectual Skills	b1	1			1											1		1		1			
	b2	1			1	1										1		1	1	1			
	b3	1	1	1	1							1				1			1				
	b4	1	1		1							1				1		1	1	1			
Applied Prof. Skills	c1	1			1											1		1		1			
	c2	1			1											1		1		1			
	c3	1			1											1		1		1			
General Tran. Skills	d1			1		1						1							1				
	d2		1	1								1							1				
	d3	1	1									1							1	1			
	d4	1	1	1								1											
	d5											1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-weekly	20 points
Mid-Term Exam	Eighth week	10 points
Written Exam	Sixteenth week	70 points
Total		100 points

6- List of references:

6-1 Course notes:

Gadallah Nabil, ***Technical Report Writing***, Modern Academy for Engineering and Technology, Cairo, Egypt, 2005

6-2 Required books

- Deborah, C.A. & Margaret D. Blickle, ***Technical Writing, Principles and Forms***, 2nd. Ed., MacMillan Publishing., 2001.

6-3 Recommended books:

1. Douglas Godfrey, ***ASLE Author's Guide***, Jan. ,1977

And in Arabic:

2. نبيل جادالله ، "البحوث وكتابة التقارير" ، القاهرة ، ٢٠٠١/٢٠٠٢.

6-4 Periodicals, Web sites, etc.

www.technical-writing.com

7- Facilities required for teaching and learning:

Internet educational lab, Computer and Data show

Course coordinator:	Prof. Dr. Nabil Gadallah
Head of the Department:	Dr. Abdelmegid Abdellatif
Date:	August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

GEN 341: Project Management

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology Department
Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department
Architecture Engineering and Building Technology Department

Department offering the course: Manufacturing Engineering &Production Technology Dpt.

Date of specifications approval: October, 2012

B - Basic information

Title: Project Management **Code:** GEN 341 **Year/level:** junior , 5th semester

Credit Hours: 2 hours **Lectures:** 2 **Tutorial:** **Practical:** none

Pre-requisite:

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to enable the students to manage a new project by giving them knowledge and skills to do this.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- What is meant by feasibility study (A3)
a2- definition of a project , project management (A3)
a3- phases of a project, steps of managing a project (A3).
a4- body knowledge of the project management
a5- Roll of the project manager (A1, A4).
a6- Planning the project (A10).

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Evaluate the feasibility study of a new project (B9)
b2-manage a project (B9)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Carry out a feasibility study for a new project (C12)
c2- Manage a project (C12).
c3- Solve an operational research problems using different techniques (C12)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate with others; work in a team and involvement in group discussion and seminars (D3, D1).

d2- Present data and results orally and in written form (D3, D9).

d2- Effectively manage tasks , time, and resources (D6)

d3- Search for information's in references and in internet (D7).

d4- Practice self-learning (D7).

Course Contribution in Program ILO s

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A3, A4, A10
B	Intellectual skills	B9
C	Professional and practical skill	C12
D	General and transferable skills	D1, D3 , D6, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Introduction	2	-	
➢ Feasibility study	-	-	
• Market study	2		
• Technical study	2		
• Financial & Economic study	2		
• Environmental study	2		
• Project management	-	-	
• Phases of a project & steps of managing a project	2		
• The project management body of knowledge	2		
• The roll of the project manager	2		
• Planning of a project	2		
• Developing a mission, vision , goals and objective for the project	2		
• Linear Programming	2	-	
• Transportation Problems	2	-	
• Assignment Problems (A project)	6	-	
Total hours	**30**	**-**	**-**

4 - Teaching and Learning and Assessment methods:

Course ILO's	Teaching Methods										Learning Methods				Assessment Method							
	Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	1		1									1					1	1		1		1
Intellectual Skills	1		1									1					1	1		1		1
Applied Professional Skills	1		1															1		1		1
General Tran. Skills	1		1									1					1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes & Reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam		
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes: Printed lecture

6-2 Required books

James P. Lewis, ***Fundamentals of Project Management***, AMACOM 3 rd Edition McGraw-Hill, NY, 2007.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc. AMACOM publications

7- Facilities required for teaching and learning:

- Lecturing room

Course coordinator: Dr. Ahmed Sarhan
Head of the Department: Dr. Abd El Mageed Abdullah
Date: August 2015

Modern Academy for Engineering & Technology
Basic Science Department
Course Specification
GEN 353: Management, International Business, and Total Quality Management

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Basic Science Department

Date of specifications approval: October, 2013

B - Basic information

Title: Management, International Business, and Total Quality Management

Code:GEN353 **Level:** Tenth Semester (Senior-2)

Credit Hours: 2 **Lectures:**2 **Tutorial/Exercise:** - **Practical:** -

Pre-requisite: non

C - Professional information

1 – Course Learning Objectives:

مع نهاية تدريس هذا المقرر يكون الطالب قد اكتسب مهارات الإدارة والتخطيط وكيفية صياغة واتخاذ القرارات الإدارية وكذلك التنظيم الإدارى وبناء الهياكل التنظيمية وايضا مفهوم وكيفية تفعيل كلا من التوجيه والقياده والرقابه والإلمام بإدارة الأعمال الدولية وايضا استيعاب وتطبيق مفهوم إدارة الجوده الشامله.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- الإدارة والتخطيط و صياغة واتخاذ القرارات الإدارية(A٧, A10)

a2- التنظيم الإدارای وبناء الهياكل التنظيميه(A٧)

a3- التوجيه والقياده والرقابه وإدارة الاعمال الدولية وإدارة الجوده الشامله (A٦, A٧, A12)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- ان يتعلم الطالب مفهوم الإدارة والتخطيط وكيفيه صياغة واتخاذ القرارات الإدارية (B3, B4, B9)

b2- ان يدرك الطالب اهمية و كذا تفعيل التنظيم الإدارى وبناء الهياكل (B5, B10)

b3- ان يتعلم الطالب كيفية التوجيه والقياده والرقابه وإدارة الأعمال الدولية و إدارة الجوده الشامله (B4, B٥, B9, B10)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- ان يمارس الطالب مهارات القيادة لفريق من زملائة اثناء الدراسة.(C1,C5)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion and seminars (D1, D3).

d2- Search for information's in references and in internet (D7).

d3- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A6, A7, A10, A12
B	Intellectual Skills	B3, B4, B5, B9, B10
C	Professional and practical skills	C1, C5
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
مفهوم الإدارة والتخطيط .	٤		
صياغة واتخاذ القرارات الإداريه .	٤		
التنظيم الإدارى وبناء الهياكل التنظيمية.	٦		
التوجيه والقياده والرقابه .	٨		
مدخل إلى إدارة الأعمال الدولية وإدارة الجوده الشامله .	٨		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1		1		1						1				1		1	1	1			
	a2	1	1	1												1		1	1	1			
	a3	1		1		1						1				1		1	1				

Intellectual Skills	b1	1														1		1	1	1			
	b2	1				1										1		1	1	1			
	b3	1	1	1								1				1			1	1			
General Tran. Skills	d1	1		1		1													1	1			
	d2			1		1													1	1			
	d3			1															1	1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
quizzes assignments	Bi-Weekly	15
Mid-Term Exam	6-th Week	15
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

None

6-2 Required books

- Robbins & coulter, ***Management***, 7th edition, 2003.
- Michael R. Czinkota, ***International Business***, 7th edition, 2005.

6-3 Recommended books:

None

6-4 Periodicals, Web sites, etc.:

None

7- Facilities required for teaching and learning:

- Computer, Datashow and Projector.

Course coordinator: Dr. Marwa Shoeib
Head of the Department: Prof. Dr. Laila Solaiman
Date: August 2015

Modern Academy for Engineering & Technology

Manufacturing Engineering and Production Technology Department

Course Specification

MNF100: Introduction to Engineering Materials

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Mechanical Engineering Department Electrical Engineering Department Architecture Engineering Department
Department offering the course:	Mechanical Engineering Department.
Date of specifications approval:	September 2015

B - Basic Information

Title: Introduction to Engineering Materials **Code:**MNF100 **Level:** Freshman, First Semester

Credit Hours: 1 **Lectures:** 1 **Tutorial/Exercise:**- **Practical:** -

Pre-requisite: -

C - Professional Information

1 – Course Learning Objectives:

By the end of this course, the students should demonstrate the knowledge and understanding of the engineering materials, materials classification and material properties. They should be able to differentiate between materials according to their physical, thermal, magnetic, mechanical properties and how to select the suitable material.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Basic information of atomic structure (A2)

a2- Characteristics of engineering materials related to the discipline (A3).

a3- Principles of ferrous and non-ferrous alloys (A4)

a4- Basic properties of copper and aluminum alloys (A3).

a5- Engineering design principles for selection of material (A4).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Investigate the required properties to choose the material (B1)

b2- Select appropriate solutions for engineering problems based on analytical thinking (B2)

b3- Assess and evaluate the characteristics and performance of component material (B5)

b4- Use the principle of engineering science in selection of the required properties (B15,B17).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Solve some simple production problems related to material and process selection (C1, C2)

c2- Apply knowledge of materials to determine the suitable used materials (C1, C2).
c3- professionally merge the engineering knowledge to improve material properties (C1, C2).

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- Work in a team and involve in group discussion and seminars (D1, D3).
d2- Communicate effectively and present data and results orally and in written form (D3).
d3- Search for information's in references and in internet (D7).
d4- Practice self-learning through preparing reports (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A4, A18
B	Intellectual skills	B1, B2, B5, B13, B15, B17
C	Professional and practical skills	C1, C2
D	General and transferable skills	D1, D3, D7, D9

Topic	Lecture hours
1- Introduction	1
• Types of engineering materials	
• Properties of materials, material testing principles	3
2- Ferrous alloys and their properties	
2-1 Steel; types and uses	
2-2 Cast iron; types and uses	8
3- Non-ferrous alloys and their properties	
3-1 Copper and its alloys	
3-2 Aluminum and its alloys	
4- Other engineering alloys	3
5- Selection of Materials	
Total hours	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1	1	1	1				1	1				
	a2	1	1	1	1			1		1				1
	a3	1	1		1				1	1		1		1
	a4	1	1	1	1			1		1		1		1
	a5	1	1	1	1			1		1			1	
Intellectual Skills	b1	1	1	1	1					1		1		1
	b2	1	1	1	1			1		1			1	1
	b3	1	1	1				1		1			1	
	b4	1	1	1	1			1		1				
Applied Prof. Skills	c1	1	1	1	1			1		1				
	c2	1	1	1	1			1		1				
	c3	1	1	1	1			1		1				
General Tran. Skills	d1			1				1						
	d2		1	1				1						
	d3			1				1						
	d4		1	1				1						

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	8-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Introduction to Engineering Material (Lecture Notes)

6-2 Required books :

David G. Rethwisch, "Fundamentals of Materials Science and Engineering", Wiley, Asia,2013

6-3 Recommended books:

William D. Callister**, "**Fundamentals of Materials Science and Engineering", Wiley, USA, 2005

6-4 Periodicals, Web sites, etc.

http://simple.wikipedia.org/wiki/Materials_science
http://www.matsci.com/
http://www.homework-help-secrets.com/atomic-structure.html

7- Facilities required for teaching and learning:

- Lecture Room
- Computer, Data show.

Course coordinator: Dr. Abdelrady Okasha
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September, 2015

Modern Academy for Engineering & Technology

Manufacturing Engineering and Production Technology Department

Course Specification
MNF101: Engineering Graphics

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering & Communication Tech. BSc Program
Computer Engineering and Information Tech. BSc. Program.
Architecture engineering and Building technology BSc. Prog.

Department offering the program: Mechanical Engineering Department.
Electrical Engineering Department.
Architecture Engineering Department.

Department offering the course: Mechanical Engineering Department

Date of specifications approval: September 2015

B - Basic Information

Title: Engineering Graphics **Code:** MNF101 **Year/level:** freshman, first semester

Credit Hours:3 **Lectures:** 1 **Tutorial:**6 **Practical:** -

Pre-requisite: Non

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to read and draw components in different drawing kinds, namely orthogonal, perspective and/or section drawings. The students will be able to apply the dimensioning principles on the drawings.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- The basic information in engineering graphics.[A2]
a2- The principles of geometrical construction in engineering graphics.[A4]
a3- Methodology of solving problems in orthographic and in successive views.[A5]
a4- The basics of developments and intersections.[A4]
a5- Section views. Methodology of solving problems in sectional views. .[A5]
a6- Conventional way of drawings. .[A8]
a7- The correct rules for dimensioning. .[A10]

B - Intellectual skills

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

b1- Solve and communicate problems in orthographic views. [B7]
b2- Solve and communicate problems in isometric and oblique drawings. [B7]
b3- Consider the benefits of solving problems of developments and intersections. .[B5]

b4- Draw different problems in sectional views. [B7]
b5- Select the proper section for each component. [B8]
b6- Draw dimensions for components from production point of view. [B3]

C - Professional and practical skills

By the end of the course the student should be able to:
c1- Produce orthographic views from 3D models. [C2]
c2- Read and understand orthographic drawing. [C3]
c3- Prepare and interpret engineering drawing. [C4]
c4- Read orthographic drawing with sectional views. [C4], [C11]
c5- Make necessary views using sections and dimensioning. [C4]
c6- Communicate by graphic language. [C4]

D - General and transferable skills

By the end of the course the student should be able to:
d1- Communicate effectively with other discipline using the graphical language. [D3]
d2- Expand their creative talents and to communicate their ideas in a meaningful manner. [D9]
d3- Search for information and engage in life – long sell learning discipline. [D1]
d4- Communicate graphically effectively. [D9]
d5- Refer to relevant literature. [D9]

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	4, 8, 10
B	Intellectual skills	3, 5, 7, 8,9
C	Professional and practical skills	2, 3, 4, 11
D	General and transferable skills	1, 3, 9

3 – Contents

Topic	Lecture hours	Tutorial hours
Drawing instruments , Draw sheets ; Scales; Folding Lettering	1	6
Geometric Construction	1	6
Alphabet of lines	1	6
Theory of orthographic projection: Projection of point ; line and plane Projection of geometric solids	1	6
Multi view drawing (of Vertical and Horizontal Surfaces)	1	6
Multi view drawing (of inclined Surfaces)	1	6
Multi view drawing (of cylindrical Surfaces)	1	6
Pictorial drawing (isometric) , Pictorial drawing (oblique)	1	6
Isometric drawing (of Vertical, Horizontal & inclined Surfaces)	1	6
Isometric drawing (of cylindrical Surfaces)	1	6
Conventional practice in ED	1	6

Importance of drawing sections ; Basic types of sections: Full sections : longitudinal ,cross – section	1	6
Off set ; Aligned sections ; Half-section ;Partial S.; Revolved & Auxiliary sections.	1	6
Dimensioning – Arrangements of dimensions – Rules for dimensions of circles ; radii ; angles ; plain holes	1	6
Revision	1	6
Total hours	**15**	**90**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method						
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiment	Modeling	Self-learning	Homework	Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1	1		1					1		1		1		1
	a2	1	1		1					1		1		1		1
	a3	1	1		1					1		1		1		1
	a4	1	1		1					1		1		1		1
	a5	1	1		1					1		1		1		1
	a6	1	1		1					1		1		1		1
	a7	1			1					1		1				1
Intellectual Skills	b1	1	1		1	1				1		1		1		1
	b2	1			1	1				1		1		1		1
	b3	1	1		1	1				1		1		1		1
	b4	1			1	1				1		1				1
	b5	1			1	1				1		1				1
	b6	1			1	1				1		1				1
Applied Professional Skills	c1	1	1		1	1				1		1		1		1
	c2	1			1	1				1		1		1		1
	c3	1			1	1				1		1		1		1
	c4	1			1	1				1		1		1		1
	c5	1	1		1	1				1		1				1
	c6	1			1	1				1						1
General Tran. Skills	d1	1	1		1	1				1						
	d2	1	1		1	1				1				1		1
	d3	1			1	1				1						
	d4	1	1		1	1				1				1		1
	d5	1			1	1				1						

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Assignments and Home works	Weekly	20
Mid-Term Exam	6th. Week	10
Written Exam	16th. week	70
Total		100

6- List of references:

6-1 Course notes

Engineering Drawing by : Prof. Mamdouh Saber

6-2 Required books

James H.Earle, Graphics For Engineering, Addison Wesley Publishing Company 1991.

6-3 Recommended books Non

6-4 Periodicals, Web sites etc . Non

7- Facilities required for teaching and learning:

- Overhead projector and screen
- Models and prototype as teaching aids

Course coordinator: Dr. Nabil Gadallah
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology

Manufacturing Engineering and Production Technology Department

Course Specification
MNF102: Principle of Production Engineering

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering & Communication Tech. BSc Program Computer Engineering and Information Tech. BSc. Program. Architecture engineering and Building technology BSc. Program.
Department offering the program:	Manufacturing Engineering and Production Technology BSc Department Electronic Engineering & Communication Tech. BSc Department Computer Engineering and Information Tech. BSc. Department. Architecture engineering and Building technology BSc. Department
Department offering the course:	Manufacturing Engineering and Production Technology BSc Department
Date of specifications approval:	September 2015

B - Basic Information

Title: Principle of Production Engineering | **Code:** MNF 102 | **Year/level:** Fresh man Second Semester

Credit Hours: 3 | **Lectures:** 1 | **Tutorial/Exercise:**-

Practical: 4 | **Total:** 3

Pre-requisite: MNF 101

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the production system and different methods of production by cutting and non-cutting processes theoretically and practically.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Basic production methods related to casting, metal forming processes, welding and metal cutting (A1)

a2- Design pattern, allowances in casting & solidification (A4).

a3- Fundamental of centrifugal casting process (A2)

a4- Classification of welding process (A1).

a5- Basic methods of hot and cold forming (A1)

a6- Applications of metal cutting processes (A1)

B - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Select the proper manufacturing process for a specific product (B2)
b2- Design the pattern for sand casting (B3)
b3- Choose the suitable welding method or different joining (B8)
b4- Use the principle of production engineering in producing good quality cheap product (B10, B2)

C - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Solve some simple production problems related to method of production selection (C3)
c2- Use the studied manufacturing methods in producing prototypes during practical hours (C7).
c3- Collect, record and submitting data about production engineering (C1).

D - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion (D1, D3).
d2- Communicate effectively and present data and results orally (D3, D9).
d3- Search for information's in references and in internet (D7).
d4- Practice self-learning.(D7,D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, ,A4.
B	Intellectual skills	B2,B3,B10,B18.
C	Professional and practical skills	C1, C3,C7.
D	General and transferable skills	D1,D3,D7,D9.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Role of production engineering, production system objective, types of industries, classification of manufacturing processes .	2		
➢ Properties of materials and testing principles	2		4
➢ Sand casting, melting of metal & furnaces. Solidification, pattern allowances, sand molding & gating system. Die casting, centrifugal & investment casting.	2		8
➢ Types of welding, oxy- acetylene welding, electric- arc welding, submerged arc welding, MIG, TIG, resistance welding, soldering & brazing	2		8
➢ Hot & cold forming, rolling, extrusion, wire drawing & sheet metal forming	3		10
➢ Metal cutting processes (Turning, milling, shaping, grinding and drilling)	4		30
Total hours	**15**		**60**

4 - Teaching and Learning and Assessment methods:

Course IL O's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1	1	1	1					1	1	1	1	1
	a2	1	1	1	1				1	1	1	1	1	1
	a3	1	1	1	1	1		1	1	1	1	1	1	1
	a4	1	1	1					1	1	1	1	1	1
	a5	1	1	1	1	1		1	1	1	1	1	1	
	a6	1	1	1	1				1	1	1	1	1	
Intellectual Skills	b1	1	1	1	1					1	1	1	1	1
	b2	1	1	1	1				1	1	1	1	1	1
	b3	1	1	1	1		1			1	1	1	1	1
	b4	1	1	1	1		1			1		1	1	
Applied Prof. Skills	c1			1			1			1	1			1
	c2	1	1		1	1				1	1			1
	c3	1	1		1					1			1	1
General	d1		1	1				1						
	d2			1				1				1		
	d3												1	
	d4							1			1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Lecture notes & workshop training notes

6-2 Required books: Serope Kalpakjiam," Manufacturing Engineering and technology", prentice hall, 2010

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.:

http://www.sme.org/manufacturingengineering/
http://www.chalmers.se/en/education/programmes/masters-info/Pages/Production-Engineering.aspx
http://w3bin.com/websites/production-engineering

7- Facilities required for teaching and learning:

- Lecture room , and workshops

Course coordinator:	Prof. Dr. Ahmed Kohail
	Dr. Maher Khalifa
Head of the Department:	Dr. Abdelmagid Abdelatif
Date:	September 2015

Modern Academy for Engineering & Technology

Architecture Engineering and Building Technology Department

Course Specification

ARC 210: Civil Engineering Technology

A- Affiliation

Relevant programs:	Computer Engineering & Information Technology B.Sc. Program Electronic Engineering &communication Technology B.Sc. Program
Departments offering the programs:	Computer Engineering & Information Technology B.Sc. Program Electronic Engineering &communication Technology B.Sc. Program
Department offering the course:	Architecture Engineering and Building Technology Department
Date of specifications approval:	October, 2013

B - Basic information

Title: Civil Engineering Technology **Code:** ARC 210 **level:** sophomore, Third Semester
Credit Hours:3 **Lectures: 2** **Tutorial: 2**
Pre-requisite: None

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:

- Study the different branches of civil engineering.
- Study civil engineering applications on different constructions.
- Study civil engineering applications on different infrastructures (highways- water supply- drainage).
- To be helpful to the students in their work that is related to civil work.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

By the end of the course the student should gain the following knowledge:
a1- how to calculate quantities of earth excavation and fill. (A2)
a2- the concept of leveling earth's surface. (A2)
a3- the usage of maps and the way of drawing it. (A7)
a4- how to compute quantities of civil construction works. (A14)

B - Intellectual skills

By the end of the course the student should be able to:
b1- Analyze similar construction projects. (B9)
b2- Take the right decision and choose the suitable solution from different alternatives. (B16)

C - Professional and practical skills

By the end of the course the student should be able to:
c1- Perform longitudinal and transverse leveling. (C1, C2)
c2- Compute quantities of civil works. (C1, C2)
c3- Draw contour maps. (C1, C2)

c4- Calculate quantities of earth excavation and fill. (C1, C2)

D - General and transferable skills

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

d1- Search for information and engage in life-long self- learning discipline. (D3)

d2- Refer to relevant literatures (D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A7, A14
B	Intellectual skills	B9, B16
C	Professional and practical skills	C1, C2
D	General and transferable skills	D3, D8

3 – Contents

Topic	Lecture hours	Practical hours	Tutorial hours
• Introduction	2		2
• Fundamentals of surveying	2		2
• Measurement of areas from maps and measurement of angles	2		2
• Leveling	2		2
• Computation of volumes	2		2
• Soil mechanics	2		2
• Highway and airports engineering	2		2
• Railway engineering	2		2
• Environmental engineering	2		2
• Building construction	2		2
• Foundations	2		2
• Building materials	2		2
• Quantities and specifications	2		2
• Isolating layers	2		2
• General revision	2		2
Total hours	**30**		**30**

4- Teaching and Learning Methods

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Brain storming					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1			1					1				1		1	1				
	a2	1			1											1		1	1	1			
	a3	1														1		1	1	1			
	a4	1		1		1																	
Intellectual Skills	b1	**1**			**1**											1		1		**1**			
	b2	**1**			**1**	**1**										1		1	**1**	**1**			
Applied Professional Skills	C1	**1**			**1**	**1**										1		1	**1**	**1**			
General Tran. Skills	d1			1	1							1								1			
	d2			1								1								1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	8-th Week	10
Written Exam	Fifteenth week	70
Total		100

6- List of References

6-1 Course notes

Civil Engineering Technology, Adham Elalfy,

6-2 Required books

المواد الهندسيه، د. كريم محمد عطا، دار الكتب، ١٩٩٥

6-3 Recommended books

Civil engineering books in the library

6-4 Periodicals, Web sites, etc.

www.ACI.com

7- Facilities Required for Teaching and Learning

- Blackboard / whiteboard / OHP / Data Show.
- Survey lab.

Course coordinator: Prof. Dr. Adham ElAlfy
Head of the Department: Prof. Dr. Ayman Nour
Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC211: Electrical Circuit Analysis-1

A- Affiliation

Relevant program:	Electronic Engineering & Communication Technology BSc Program. Computer Engineering & Information Technology B.Sc. Program
Department offering the program:	Electronic Engineering & Communication Technology BSc Program. Computer Engineering & Information Technology B.Sc. Program
Department offering the course:	Electronic Engineering & Communication Technology Department.
Date of specifications approval:	October, 2013.

B - Basic information

Title: Electrical Circuit Analysis-1 **Code:** ELC211 **Level:** Sophomore, Third Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2

Pre-requisite:MTH102

C - Professional information

1 – Course Learning Objectives:

The main objective of this Course is to introduce the basic concepts and theories of circuit analysis, operational amplifiers, natural response of RL and RC circuits, step response of first order RL and RC circuits, natural and step responses of RLC circuits, and sinusoidal steady - state power calculations.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Basic concepts, ideas and laws of electrical circuit analysis. (A1)

a2-Voltage, current, and power calculation for a simple resistive circuits. (A1, A5)

a3- Applications of Ohm's and Kirchhoff's Laws. (A1, A5)

a4- Series, parallel, and delta-star connections principles. (A1, A5)

a5- Different techniques of circuit analysis. (A1, A15)

a6- Operational-amplifier characteristics and applications. (A1, A15)

a7- Characteristics of a sinusoidal current and voltage. (A1, A8)

a8- Basic concepts of RL and RC circuits. (A1, A5)

a9- Basic concepts of RLC circuits. (A1, A5)

.

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1-Apply the Ohm's and K's laws. (B1, B2)

b2- Apply the powerful techniques of circuit analysis. (B1, B2, B4)

b3- Use the operational-amplifier in different applications. (B5, B6, B7)

b4- Apply Thevenin's theorem. (B1, B2, B4)

b5- Apply the maximum power transfer theory. (B1, B2, B4)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Use different types of basic hand tools and different types of switches to construct a circuit. (C3, C5)

c2- Identify all types of electrical lamps and primary cells (Batteries) that are used in numerous circuits applications. (C1, C3, C5)

c3- Read and determine the value of the resistance and capacitance using color code. (C1, C5, C10)

c4- Use different symbols of circuits. (C1, C3, C5)

c5- Use and read the measured values shown by oscilloscopes, and laws principles. (C1, C6, C10)

c6- Construct simple circuits applying the learned laws and principles given in lectures. (C9, C10, C11)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate effectively through reports and e-mails. (D1, D2, D3)

d2- Effectively manage tasks, time, and resources. (D2, D6)

d3- Search for information and engage in life-long self-learning discipline. (D3, D7, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A5, A8, A15
B	Intellectual skills	B1, B2, B4, B5, B6, B7
C	Professional and practical skills	C1, C3, C5, C6, C9, C10, C11
D	General and transferable skills	D1, D2, D3, D6, D7, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1. Units Dimensions and Standards.	2	1	2
2. Circuit Variables and elements.	2	1	2
3. Simple Resistive Circuit.	4	2	4
4. Node Voltage Method.	2	1	2
5. Mesh Current method	2	1	2
6. Source Transformation and Supper Position Principle.	4	2	4
7. Thevenin's Theorem.	4	2	4
8. Operational Amplifiers.	4	2	4
9. Inductance, Capacitance and Mutual Impedances.	2	1	2
10. Response of RL and RLC Circuits.	4	2	4
Total hours	30	15	30

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory &Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1				1		1			1		1	1	
	a2	1				1		1			1		1	1	
	a3	1				1		1			1		1	1	
	a4	1	1			1		1			1	1	1	1	
	a5	1				1		1			1		1	1	
	a6	1	1	1		1		1					1	1	
	a7	1	1	1		1		1				1	1	1	
	a8	1		1		1		1		1			1	1	
	a9	1		1		1		1		1			1	1	
Intellectual Skills	b1				1	1		1			1		1	1	
	b2				1	1		1			1		1	1	
	b3				1	1		1				1	1	1	
	b4				1	1		1					1	1	
	b5				1	1		1					1	1	
Applied Professional Skills	c1						1								1
	c2						1								1
	c3						1								1
	c4						1								1
	c5						1								1
	c6						1								1
General Tran. Skills	d1						1								
	d2						1								
	d3						1								

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1- Electrical Circuit Analysis-1 "*Theoretical part*".

2-Electrical Circuit Analysis-1 "*Practical part*".

6-2 Required books

1. Boylestad, ***Introductory Circuit Analysis***, Tenth Edition, 2003.
2. David E. Jonson, ***Electrical Circuit Analysis***, Prentice Hall, USA, 1999.

6-3 Recommended books

James W. Nilsson, and Susan A. Riedel, ***Electric Circuits***, Pearson Education Inc., 8thEdition, 2008.

6-4 Periodicals, Web sites, etc.

- https://en.wikiversity.org/wiki/Electric_Circuit_Analysis.
- https://en.wikibooks.org/wiki/Electronics/DC_Circuit_Analysis.

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer lab installed by MATLAB and ORCAD software.

Course coordinator: *Prof. Dr. Said Refai.*
Dr. Haytham Gamal.
Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem.*
Date: 1 / 7 / 2015.

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC212: Electrical Circuit Analysis-2

A- Affiliation

Relevant program:	Electronic Engineering & Communication Technology BSc Program
Department offering the program:	Electronic Engineering & Communication Technology Department
Department offering the course:	Electronic Engineering & Communication Technology Department.
Academic level:	Sophomore
Date of specifications approval:	October, 2013

B - Basic information

Title: Electrical Circuit Analysis-2 **Code:** ELC212 **Level:** Sophomore, Fourth Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial:**3 **Practical: –**

Pre-requisite: ELC211

C - Professional information

1 – Course Learning Objectives:

The main Objective of this course is to introduce the basic concepts and theories of power calculations in sinusoidal steady state, balanced three-phase circuits, mutual inductance, Laplace transform and its applications in circuit analysis, transfer function and two-port circuits.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Basic concepts of power calculations in sinusoidal steady state. (A1, A5)
a2- Basic concepts of the balanced three-phase circuits. (A1, A2, A3)
a3- Principles of mutual inductance. (A1, A3)
a4- Principles of series and parallel resonance. (A1, A2)
a5- Laplace transforms theory. (A4, A5)
a6- Transfer function. (A3, A5, A6)
a7- Principles of the two-port circuits. (A2, A6)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Use the principles of the balanced three-phase circuits. (B1,B2)
b2-Apply the principles of series and parallel resonance. (B3, B4)
b3- Apply the Laplace transformation technique to circuit analysis. (B5, B6, B7)
b4- Use the transfer function. (B1, B4)
b5- Apply the principles of two-port circuits in circuit's analysis. (B1, B4)

c - Professional and practical skills:

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

c1- Estimate the cost of the electricity bill. (C1, C2)
c2- Improve the power factor for companies and industrial factors. (C1, C2)

c3- Implement the achieved knowledge to recognize 3-phase balanced circuits and its analysis. (C1, C2)
c4- Analyze the given realized circuits excited by other than simusoidal sources. (C1, C2)
c5- Design the frequency- selective circuit. (C1, C2)
c6- Implement the techniques of two- port terminated network and anlyze it to obtain its charachteristics. (C1, C2)

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1- Communicate effectively through reports and e- mails. (D1, D2, D3)
d2- Effectively manage tasks, time, and resources. (D2, D7)
d3- Search for information and engage in life-long self-learning discipline. (D7, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	**Knowledge and understanding**	A1, A2, A4, A5, A23
B	**Intellectual skills**	B1, B2, B3, B4, B5, B6, B7
C	**Professional and practical skills**	C1, C2
D	**General and transferable skills**	D1, D2, D3, D7, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Sinusoidal steady- state analysis.	2	3	-
2-Techniques of circuit analysis in AC.	4	6	-
3- Sinusoidal steady- state power calculation.	4	6	-
4-Balanced three- phase circuit.	4	6	-
5- Introduction to Laplace- Transform.	2	3	-
6- Laplace- Transform circuit analysis.	4	6	-
7- Techniques of circuit analysis using Laplace- Transform.	4	6	-
8- Frequency selective circuits.	4	6	-
9- Two- ports networks.	2	3	-
Total hours	**30**	**45**	

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1				1		1			1		1	1	
	a2	1				1		1			1		1	1	
	a3	1	1			1		1			1		1	1	
	a4	1				1		1				1	1	1	
	a5	1				1		1					1	1	
	a6	1	1	1		1		1		1		1	1	1	
	a7	1		1		1		1		1			1	1	
	a8	1		1		1		1		1			1	1	
Intellectual Skills	b1				1	1		1			1		1	1	
	b2				1	1		1			1	1	1	1	
	b3				1	1		1					1	1	
	b4				1	1		1					1	1	
	b5				1	1		1					1	1	
	b6				1	1		1					1	1	
Applied Professional Skills	c1	1		1		1		1		1			1	1	1
	c2	1		1		1		1		1			1	1	1
	c3	1		1		1		1		1			1	1	1
	c4	1		1		1		1		1			1	1	1
	c5	1		1		1		1		1			1	1	1
	c6	1		1		1		1		1			1	1	1
General Tran. Skills	d1									1					
	d2			1	1										
	d3								1						

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	-
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1- Electrical Circuit Analysis-2 "*Theoretical part*".

6-2 Required books

- Boylestad, ***Introductory Circuit Analysis***, Tenth Edition, 2003.
- David E. Jonson, ***Electrical Circuit Analysis***, Prentice Hall, USA, 1999.

6-3 Recommended books

James W. Nilsson, and Susan A. Riedel, ***Electric Circuits***, Pearson Education Inc., 8thEdition, 2008.

6-4 Periodicals, Web sites, etc.

http://www.freebookcentre.net/Electronics/Basic-Electronics-Books.html.

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer lab installed by MATLAB and ORCAD software.

Course coordinator: *Prof. Dr. Said Refai.*
Dr. Haytham Gamal.
Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem.*
Date: 1 / 7 / 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC 213: Electrical Measurements

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program, Computer Engineering and Information Technology BSc Program.
Department offering the program: Electronic Engineering and Communication Technology Department.
Department offering the course: Electronic Engineering and Communication Technology Department.
Date of specifications approval: October, 2012.

B - Basic information

Title: Electrical Measurements **Code:** ELC 213 **Level:** Sophomore, Fourth Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: ELC 211

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand and analyze the different types of errors of the electrical measurements. They should understand the construction, basic concepts, and operation of the different electrical measuring instruments such as: Voltmeters, ammeters, wattmeter, Ohmmeter, galvanometers….etc. Also it enables the students to understand the Principles of design, procedures, and error analysis of different methods used for measuring electrical quantities (such as power, resistors, and storage elements).

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Concepts of different system of units, analysis of measurement errors, accuracy classes and standards of measuring instruments (A1).
a2- Construction of analog measuring instruments (A4).
a3- Principles of operation, and performance of analog measuring instruments (A14,A15).
a4- Principles of design, properties, procedures, and error analysis of different methods used for measuring electrical quantities (such as power, resistors, and storage elements) (A4,A15).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Select, and analyze the more appropriate electrical measuring circuit and instruments for a given electric measurement (V, I, P, R, or Z) (B3,B5,B7).
b2- Deduce the torque equation of the electrical measuring instruments (B1,B3).
b3- Evaluate the properties of the electrical measuring instruments (B5,B13).
b4- Investigate the effect of the measuring instruments on the accuracy of electrical measurements (B6,B10,B14).
b5-Analyze the resulting error of the electrical measurements (B5, B9, B11).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Design, assemble, and operate the most suitable electrical measuring circuit diagram from the measuring errors point of view (C3,C16,C17).

c2- Calculate, and analyze the resulting systematic errors (C2,C5,C18).

c3- Use relevant electrical laboratory equipment and analyze the results correctly (C15,C20).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate with others, work in a team and involvement in group discussion (D1,D3).

d2- Present data and results orally and in written form (D6).

d3- Prepare and present technical reports (D8,D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A14,&A15
B	Intellectual skills	B1,B3,B5,B6,B7,B9,B10,B11,B13,&B14
C	Professional and practical skills	C2,C3,C5,C15,C16,C17,C18,&C20
D	General and transferable skills	D1,D3,D6,D8,&D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Units, Dimensions, and Standards.		1	
➢ Types and Analysis of Errors in Electrical Measurements.	2	1	2
➢ Fundamentals of Analogue Electrical Measuring Instruments.	2	1	2
➢ Deflection Type Permanent Magnet Moving Coil and Electro-dynamic	4	2	2
➢ Galvanometers, and DC Multi-Range Voltmeters, and Ammeters.	4	2	4
➢ AC Rectifier Type Voltmeters and Ammeters.	2		2
➢ Series and Multi-Range Ohmmeters.	2	1	2
➢ DC and AC Electro-dynamic Voltmeters, Ammeters, and Wattmeters.	4	2	4
➢ DC and AC Power Measurements.			2
➢ Accurate measurements of very low, low, High, and very High Resistances.	4	2	4
➢ Capacitance and Inductance Measurements Using AC Bridges.	4	2	4
➢ Impedance measurements using resonance method.	2	1	2
Total hours	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods					Assessment Method						
		Lecture	Tutorials	Problem solving	Laboratory &Experiments			Researches and Reports	Self learning				Written Exam	Practical Exam	Quizzes	Mid-Term Exam	Assignments		
Knowledge & Understanding	a1	1	1	1				1	1				1		1	1	1		
	a2	1	1	1					1				1		1	1	1		
	a3	1	1	1	1			1					1	1	1	1	1		
	a4	1	1	1	1			1					1	1	1				
Intellectual Skills	b1	1			1			1					1	1					
	b2	1	1	1				1	1				1		1	1	1		
	b3	1	1	1				1					1		1	1	1		
	b4	1	1	1	1				1				1	1	1	1	1		
	b5	1	1	1	1			1	1				1	1	1	1	1		
Applied Prof. Skills	c1	1	1	1	1			1					1	1	1	1			
	c2	1	1	1	1				1				1	1	1	1			
	c3	1	1	1	1			1						1	1	1			
General Trans. Skills	d1	1			1			1	1										
	d2	1	1	1	1			1	1					1	1		1		
	d3	1	1	1	1			1	1					1	1		1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments, reports & Quizzes	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes:

- Shouman E.I. SHOUMAN, ELC 213, ***Electrical Measurements***, Cairo, 2013.
- Shouman E.I. SHOUMAN, ELC 213: ***Electrical Measurements (Lab.)***, Cairo, 2013

6-2 Required books

- Albert D. Hefrick, and William D. Cooper, ***Modern Electronic Instrumentation and Measurement Techniques***, Prentice- Hall International, Inc., London UK, 2009.
- Robert A. Witte, Electronic Test Instruments; ***Analog and Digital Measurements***, Prentice Hall PTR USA, 2002.

6-3 Recommended books:

- David A Bell, ***Electronic Instrumentation and Measurements***, Oxford univ. press, 1997.
- Larry D. Jones, and A. Foster Chin, ***Electronic Instruments and Measurements***, Prentice- Hall International, Inc., London UK, 1991.

7- Facilities required for teaching and learning:

Electrical and Electronic Lab.

Course coordinator:	Prof. Dr. Shouman E.I. SHOUMAN
Head of the Department:	Prof. Dr. Mokhtar Abd-ElHalim
Date:	August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC214: Modern Theory for Semiconductor Devices

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Basic Science department

Date of specifications approval: October, 2012

B - Basic information

Title: Modern Theory for Semiconductor Devices **Code:**ELC214 **Level:** Third Semester (Sophomore)

Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2

Pre-requisite: PHY 102

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the particle-wave duality, photoelectric effect and Compton scattering. They should understand basic concepts of quantum mechanics, application of infinite potential well, simple harmonic oscillator and the tunnel effect. They can be having a good learning about inductor atomic structure and electronic configuration of elements, energy stats and spectra of molecules and solids. They also should understand the energy bands of solids, theory and structure electrical conduction of metals, insulator, and semiconductors.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1-Understand of the particle- wave duality and photoelectric effect (A3, A8,A9).
a2- Compton scattering (A8,A9).
a3- Application of infinite potential well, simple harmonic oscillator and the tunnel effect (A1, A2).
a4- Inductor atomic structure and electronic configuration of elements (A1, A3).
a5- Energy stats and spectra of molecules and solids (A1, A3).
a6- The energy bands of solids (A1, A3).
a7- Theory and structure electrical conduction of metals, insulator and semiconductors. (A1,A2,A3,A4,A5, A8, A9).

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Applications on the photoelectric effect and Compton scattering (B4, B6, B7).
b2-Deduce mathematical relations describing the energy of photon and electron (B1, B2,B12).
b3- Deduce relations describing the collision between photon and electron (B4, B5. B7, B8, B9).
b4- Classify and compare the different ways of the conductivity of elements (, B5, B7, B8, B11,B12).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Design, operate, test and maintain photocell (C1, C2, C3, C4, C12)

c2- Calculate the energy of electron and photon(C1, C2, C3, C4, C11).

c3- Use the light to introduce electric current (C7).

c4-Desine amplifiers and transformers (C1, C2,C4).

c5-Make current and voltage rectification (C1, C11, C12).

c6- Use experimental facilities to assemble and operate electronic circuits (C1:C4, C7, C8, C11, C12).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion and seminars(D1, D3).

d2- Communicate effectively and present data and results orally and in written form(D3).

d3- Use ICT facilities in presentations (D4).

d4- Search for information's in references and in internet(D7).

d5- Practice self-learning(D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A8, A9
B	Intellectual skills	B1, B2, B4, B5, B6, B7, B8, B9, B11, B12
C	Professional and practical skills	C1, C2,C3, C4, C7, C8, C11, C12
D	General and transferable skills	D1, D3, D4, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to quantum physics	1		
Classical and modern theory of light	1		1
Plank's explanation for black body radiation	1	2	2
Photo electric effect	1	2	2
Compton experiment	1	2	2
Compton scattering	2	2	
Particles behaving as a wave and particle wave complementarily	1	2	2
Introduction to wave mechanics	2	2	1
The uncertainty principle	2	2	1
Wave function for free particle	1		
Wave function of the particle	3	2	1
The simple harmonic oscillator	2	2	1
Scanning tunneling microscopy	2	2	
Introduction to atomic physics	1		
Models of atoms	2	2	1
Bonding mechanisms	2	4	1
Bonding in solids	3	2	
Classical free electron model of metals	3	2	
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1		1	1	1	1					1				1		1	1	1			
	a2	1		1	1	1	1									1		1	1	1			
	a3	1		1	1	1	1									1		1	1	1			
	a4	1	1	1	1	1	1					1				1		1	1	1			
	a5	1		1	1	1	1									1	1	1	1	1			
	a6	1		1		1	1					1				1			1	1			
	a7	1		1	1	1	1					1				1			1	1			
Intellectual Skills	b1	1		1	1	1	1									1		1		1			
	b2	1		1	1	1	1									1		1	1	1			
	b3	1	1	1	1	1	1					1				1	1		1	1			
	b4	1	1	1	1	1	1					1				1	1	1	1	1			
Applied Professional Skills	c1	1	1	1	1	1	1									1	1	1	1	1			
	c2	1		1	1											1		1	1	1			
	c3	1		1		1						1				1			1	1			
	c4	1		1	1	1										1	1		1	1			
	c5			1		1	1									1	1		1	1			
	c6			1		1	1									1	1		1	1			
General Tran. Skills	d1	1		1		1	1					1							1				
	d2	1	1	1			1					1							1				
	d3	1	1				1					1							1	1			
	d4	1	1	1		1	1					1											
	d5	1				1	1					1							1				

Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-2 Weeks	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:
6-1 Course notes:
None

6-2 Required books
Peter Y. Yu, Manuel Cardona, Fundamentals of Semiconductors: Physics and Materials Properties, Springer, 2010.

6-3 Recommended books: Non
6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

- Modern and Semiconductor Physics Lab.

Course coordinator:	Prof. Dr. Laila Soliman
Head of the Department:	Prof. Dr. Laila Soliman
Date:	August 2015

Modern Academy for Engineering & Technology

Basic Science Department

Course Specification

ELC215: Semiconductor for Microelectronics

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Basic Science department

Date of specifications approval: October, 2012

B - Basic information

Title: Semiconductor for Microelectronics **Code:**ELC215 **Level:** Sophomore, Fourth Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: ELC214

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the properties of semiconductor materials. They have to understand the crystal structure and band structure of semiconductors. They have to able to make comparison between intrinsic and doped semiconductor carriers transport. They have to understand the structures, characteristics, principal of operation and applications of PN junction (diode). They have to study the characteristics (forward and reversible) of zener and tunnel diodes. They have to study Scotty, Ohmic contact, heterojunction, bipolar junction transistor (BJT), junction field effect transistor (JFET), metal oxide semiconductor transistor (MOSFT). They have to study physical structure, basic configuration, and I-V characteristic.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1-Understand of the properties of semiconductor materials (A3, A8,A9).
a2- The crystal structure and band structure of semiconductors (A8,A9).
a3- make comparison between intrinsic and doped semiconductor carriers transport (A1, A2).
a4- understand the structures, characteristics, principal of operation and applications of PN junction (diode (A1, A3).
a5- the characteristics (forward and reversible) of zener and tunnel diodes (A1, A3).
a6- Scotty, Ohmic contact, hetero junction, bipolar junction transistor (BJT), junction field effect transistor (JFET), metal oxide semiconductor transistor (MOSFT) (A1, A3).
a7- physical structure, basic configuration and I-V characteristic. (A1, A2, A3, A4, A5, A8, A9).

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Develop Applications on intrinsic and doped semiconductor(B4, B6, B7).
b2-Deduce mathematical relations describing the conductivity of different types of semiconductors (B1, B2,B12).
b3- Deduce relations describing the connection between P-type and N-type semiconductors (B4, B5. B7, B8, B9).

b4- Classify and compare between different types of diodes and transistors(, B5, B7, B8, B11,B12).

c - Professional and practical skills:
On successful completion of the course, the student should be able to:
c1- Design, operate, test and maintain solar cell (C1, C2, C3, C4, C12)
c2- Calculate the conductivity of different types of semiconductors(C1, C2, C3, C4, C11).
c3- Use the light to introduce electric current (C7).
c4-Design amplifiers and transformers (C1, C2,C4).
c5- Make current and voltage rectification (C1, C11, C12).
c6- Use experimental facilities to assemble and operate electronic circuits (C1:C4, C7, C8, C11, C12).

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- Work in a team and involve in group discussion and seminars(D1, D3).
d2- Communicate effectively and present data and results orally and in written form(D3).
d3- Use ICT facilities in presentations (D4).
d4- Search for information's in references and in internet(D7).
d5- Practice self-learning(D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4
B	Intellectual skills	B1, B2, B4, B5, B6, B7, B8, B9, B11, B12
C	Professional and practical skills	C1, C2,C3, C4, C7, C8, C11, C12
D	General and transferable skills	D1, D3, D4, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to semiconductors	1		
Classify different types of semiconductors	1		1
Crystal structure and band structure of semiconductor	1	2	2
Conduction in different types of semiconductor	2	2	2
P-N junction	1	2	2
Forward and reveres bias and breakdown	2	2	
Diode	1	2	2
Zener diode	2	2	1
Tunnel diode	2	2	1
Solar cell	1		
Application of diodes	3	2	1
Scotty diode	2	2	1
Tunnel diode	2	2	
Bipolar junction transistor (BJT)	2	2	1
Junction field effect transistor (JFET)	2	4	1
Metal oxide semiconductor transistor(MOSFT)	3	2	
Physical structure, basic configuration and I-V characteristics	3	2	
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1	1	1					1				1		1	1	1			
	a2	1	1	1	1	1	1									1		1	1	1			
	a3	1	1	1	1	1	1									1		1	1	1			
	a4	1	1	1	1	1	1					1				1		1	1	1			
	a5	1	1	1	1	1	1									1	1	1	1	1			
	a6	1	1	1		1	1					1				1			1	1			
	a7	1	1	1	1	1	1					1				1			1	1			
Intellectual Skills	b1	1		1	1	1	1									1		1		1			
	b2	1		1	1	1	1									1		1	1	1			
	b3	1	1	1	1	1	1					1				1	1		1	1			
	b4	1	1	1	1	1	1					1				1	1	1	1	1			
Applied Professional Skills	c1	1	1	1	1	1	1									1	1	1	1	1			
	c2	1		1	1											1		1	1	1			
	c3	1		1		1						1				1			1	1			
	c4	1		1	1	1										1	1		1	1			
	c5			1		1	1									1	1		1	1			
	c6			1		1	1									1	1		1	1			
General Tran. Skills	d1	1		1		1	1					1							1				
	d2	1	1	1			1					1							1				
	d3	1	1				1					1							1	1			
	d4	1	1	1		1	1					1											
	d5	1				1	1					1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-2 Weeks	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:
6-1 Course notes: Non
6-2 Required books:
Peter Y. Yu, Manuel Cardona, *Fundamentals of Semiconductors: Physics and Materials Properties, Springer, 2010.*

6-3 Recommended books: Non
6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:
- Semiconductor Physics Lab.

Course coordinator:	Prof. Dr. Laila Soliman
Head of the Department:	Prof. Dr. Laila Soliman
Date:	August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC310:Control- I (Principles of Automatic Control)

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the course: Electronic Engineering & Communication Technology BSc Department

Date of specifications approval: September, 2015

B - Basic information

Title: Control - I **Code:ELC310** **Year/Level:** Junior , Fifth semester

Credit Hours: 4 **Lectures:**3 **Tutorial:**1 **Practical:**2

Pre-requisite:MTH203

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of how to model , analyze the performance of linear F.B. control systems and design appropriate controllers to achieve the required performance either in time or in frequency domains using the classical control theory tools .

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Theoretical background needed to develop and solve the mathematical model of physical systems (A1)

a2- Concept of transfer function of linear system and block diagram algebra (A1,A5)

a3-Time domain analysis and performance evaluation of F.B. control system: transient response, steady state error" accuracy", and stability (A16).

a4- Procedures of design of controllers "P,PI,PID" to improve the system performance (A4,A16).

a5- Procedure of constructing and using the Root-Loci in analysis and design of control system (A1, A16).

a6- Frequency domain analysis& design of control systems (A4,A16).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Deduce the mathematical models, transfer functions, and state-space model for typical electrical and mechanical systems (B1,B13).

b2- Investigate transient response, steady state error, and stability of linear F.B. system (B1,B2,B13).

b3- Investigate how to improve the feedback system performance (transient response, steady state error, stability) by designing of an appropriate controller (B5,B7).

b4- construct and Investigate the control system performance using root locus method (B1,B13).

b5- deduce the frequency response plots of control systems and investigation of different types of system compensators (B1,B2,B7).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- construct, test, and investigate the performance characteristics of open and closed loop control system (C1, C12).

c2- calculate the transient parameters and steady state values of control system response (C1, C12).

c3- design of proper controller to achieve certain performance of a given control system (C1, C2, C3, C12).

c4- carry out practical testing of the performance of servo system with P, PI and PID controllers (C5, C11, C14, C17).

c5- use experimental facilities to investigate the control system (open loop & closed loop) performance (C5, C11, C14, C17).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- search for information in reference and internet (D7).

d2- present data and results orally and in written form (D3, D9).

d3- communicate with others, work in a team and involvement in group discussion and seminars (D1,D3).

d4- practice self learning (D7,D9).

Course Contribution in the Program ILO's:

ILO's		Program ILO's
A	Knowledge and understanding	A1,A4,A5,A16
B	Intellectual skills	B1,B2,B5,B7,B13
C	Professional and practical skills	C1,C2,C3,C5,C11,C12,C14,C17
D	General and transferable skills	D1,D3,D7,D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Introduction to control system (closed loop versus open loop control).	2		4
➢ Mathematical background for solving of linear time-invariant systems (differential equations & Laplace transform).	3	2	
➢ Transfer function of system, block algebra & Mason's gain formula.	3	1	
➢ Closed loop system subjected to disturbances & errors of system.	2	1	4
➢ State-space representation of dynamic system & state transition matrix& solution of state equation.	4	1	
➢ First order & second order open and closed loop responses.	3	1	4
➢ Effect of roots of the system characteristic equation (poles of system) on the system transient response parameters.	2	1	2
➢ Basic control actions (P, PI, PD and PID), and system performance.	6	2	8
➢ Stability of linear control system (Routh-Hurwitz criterion).	3	1	2
➢ Root locus plots concept and system analysis.	3	2	
➢ Frequency response analysis and Bode diagrams.	4	1	2
➢ The concept of stability in the frequency domain (polar diagram & Nyquist criterion).	6	1	2
➢ Design of control system via root locus and frequency domain.	4	1	2
Total hours	**45**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Methods							
		Lecture	Laboratory & Experiments	Discussions & Seminars	Tutorials	Problem solving						Modeling	Researches & Reports						Quizzes	Assignments	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1			1	1							1						1		1		1
	a2	1			1	1							1						1		1		1
	a3	1	1		1	1						1	1						1		1	1	1
	a4	1	1		1	1						1	1						1	1	1	1	1
	a5	1			1	1							1						1	1	1		1
	a6	1			1	1							1						1		1		1
Intellectual Skills	b1	1			1	1						1	1						1	1	1		1
	b2	1	1		1	1							1						1	1	1	1	1
	b3	1	1		1	1						1	1						1	1	1	1	1
	b4	1			1	1							1						1	1	1		1
	b5	1			1	1							1						1	1	1		1
Applied Professional Skills	c1	1	1		1	1						1	1						1	1	1	1	1
	c2	1			1	1							1						1	1	1		1
	c3	1	1		1	1						1	1						1	1	1	1	1
	c4	1	1		1	1						1	1						1	1	1	1	1
	c5		1		1	1						1	1							1		1	
General Tran. Skills	d1				1	1							1										
	d2	1	1		1								1							1	1	1	1
	d3	1	1										1										
	d4												1							1	1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes& Reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes:

Tantawy, M. (2014) Control - 1 "Principles of Automatic Control" – (Lecture) Cairo: MAM Press
Tantawy, M. (2014) Control - 1 "Principles of Automatic Control" – (Lab.) Cairo: MAM Press

6-2 Required book :

Ogata, K. (2010) Modern Control Engineering.Prentice-Hall,INC.

6-3 Recommended books:

Kuo, B.C.(2010) Automatic Control System. John Wiley& Sons.
Dorf, R. & Bishop, R. (1995) Modern Control Systems. A. Wesley.

6-4 Periodicals, Web sites, etc.

http://www.control.1th.se/Education/DoctorateProgram/linear-systems.htm l

http://engineersevanigm.blogspot.com/2013/09/automatic-control-by-benjamin-c-kuo-ebook-free-pdf-download-read-online.html

http://ocw.mit.edu/courses/aeronautics-and-astronautics/16-06-principles-of-automatic-control-fall-2012/lecture-notes/

7- Facilities required for teaching and learning:

Lectures
Automatic control Lab.

Course coordinator:	Ass. Prof. Dr. Magdy O. Tantawy
Head of the Department:	Dr. Mokhtar Abd El- Haleem
Date:	September 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC311: Communications-1

A- Affiliation

Relevant program:	Electronic Engineering & Communication Technology BSc Program
Department offering the program:	Electronic Engineering & Communication Technology Department
Department offering the course:	Electronic Engineering & Communication Technology Department.
Date of specifications approval:	October, 2013

B - Basic information

Title: Communications-1 **Code:** ELC311 **Year/level:** Junior, Sixth Semester

Credit Hours: **Lectures:** 2 **Tutorial:**1

Practical: 2 **Total:** 3

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to introduce main principles of communication system beginning from old analog communication system tell modern digital communication systems. In addition, main stages of communication system will be explained in details in this course stressing on various types of analog modulation / demodulation techniques,.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Principles of communications system and its stages. (A18).

a2- Classifications of signals, communication channels and media (A24).

a3- Systems and signals representations in communications systems. (A18, A24)

a4- Main concept of information theory. (A2, A17, A18)

a5- Modulation process – comparison between analog and digital modulation – C.W. modulation techniques. (A4, A18, A24, A27)

a6- Different between baseband and band pass modulation. (A24, A27)

a7- Various types of analog modulation techniques. (AM – FM – PM) (A27)

.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Classify electrical signal based on signal waveform. (B7, B15)

b2- Decide which modulation technique suitable for communication user needs among analog techniques. (B7, B15)

b3- Estimate waveform, spectrum and bandwidth at the output of each stage in analog communication system. (B7, B15)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Connect electronic module simulating various stages in communication circuits filters, oscillators and

modulators. (C19, C20)

c2- Observe and record input and output signals obtained by each communication system module using oscilloscopes then comment on results. (C19, C20)

c3- Take measurements for signal voltages and frequency obtained at the output of various types of filters and oscillators. (C19, C20)

c4-Examine simple communication system using various forms of analog modulation/ demodulation modules: DSB-SS, SSB, FM, and PM. (C19, C20)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate with others; work in a team and involvement in group discussion and seminars (D3).

d2- Present data and results orally and in written form (D6).

d3- Search for information's in references and in internet (D7).

d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A18, A24, A27
B	Intellectual skills	B7, B15.
C	Professional and practical skills	C19, C20.
D	General and transferable skills	D3, D5, D6, D7.

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1- Introduction to basic principles of communication systems.	2	2	0
2-Basics of signaling and various sources of information signals.	2	1	4
3- Different forms of communication channels and media.	2	1	4
4- Systems and signals representations in comm. systems.	2	2	2
5- Main concept of information theory.	2	0	2
6- Modulation process – comparison between analog and digital modulation – C.W. modulation techniques.	2	2	2
7- Baseband and band pass modulation.	2	0	4
8- Amplitude modulation and its different forms: AM, DSB-SC, SSB – Amplitude demodulation.	6	2	6
9- Television communication system (transmission and reception) using VSB technique.	2	0	0
10- Frequency modulation and demodulation.	4	3	4
11- Phase modulation and demodulation.	4	2	2
Total hours	**30**	**15**	**30**

4 – Teaching, Learning and Assessment methods:
6- List of references:

Course ILO's		Teaching methods						Learning methods			Assessment method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1		1	1					1	1			1	
	a2	1	1	1	1	1		1	1		1	1	1	1	
	a3	1	1	1	1	1		1			1		1	1	
	a4	1		1		1			1	1	1	1		1	
	a5	1	1		1	1		1	1				1	1	
	a6	1	1		1			1				1	1	1	
	a7	1	1	1	1	1		1	1				1	1	
Intellect. Skills	b1	1			1	1		1			1	1	1	1	
	b2	1	1	1	1	1		1				1	1	1	
	b3				1	1		1				1	1	1	
Applied Professional Skills	c1						1								1
	c2						1								1
	c3						1								1
	c4						1								1
General Tran. Skills	d1			1	1				1						
	d2			1	1				1	1					
	d3			1						1					

Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes& Reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6-1 Course notes

1- Communications (I) "*Theoretical part*"

2- Communications (I) "*Practical part*"

6-2 Required books

1- B. Lathi, ***Modern Digital and Analog communication systems,*** Oxford press 1998.

2- *Electronic Communication systems,* kendey,Davis Mc Graw-Hill Book

6-3 Recommended books

S. Haykin, ***Communication systems***, 4th edition J. W. 2001.

6-4 Recommended Web site

https://en.wikipedia.org/wiki/Communications_system

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator:	*Prof. Dr. Adel El- Sherif*
Head of the Department:	*Prof. Dr. Mokhtar Abd El- Haleem*
Date:	August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC312: Microelectronics Circuits-1

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the course: Electronic Engineering &Communication Technology Department.

Date of specifications approval: October, 2013

B - Basic information

Title: Microelectronics Circuits-1 **Code:** ELC312 **Level:** Junior, Fifth Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2

Pre-requisite: PHY102

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the basic concepts and theory of Micro Electronics circuit and devices and implementation of these circuits.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Identify Linear and non Linear circuits. (A13)

a2- Design different configuration of op-amp circuits. (A4)

a3- Understands the different diode applications. (A3)

a4- Understands the Basic functions of transistors. (A8)

.

B - Intellectual Skills

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

b1- Design the op-amp circuits. (B7)

b2- Give the correct decision and test his solutions. (B2.)

b3- Analyze the technical problems and find a suitable solution. (B2)

b4- Understand the JFET & CMOSFET circuits. (B5)

C - Professional and Practical Skills

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

c1- Develop a system to get a better efficiency (C3)

c2- Establish the power supply circuits using diode rectifiers. (C3)

c3- Use data sheets & read characteristics of different electronic components (C17)

D - General and Transferable Skills

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

d1- Communicate effectively through assignments and e- mails. (D3)
d2- Lead and motivate individuals. (D5)
d3- Effectively manage tasks, time, and resources. (D6)
d4- Search for information and engage in life-long self-learning discipline. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	**Knowledge and understanding**	A3, A4 , A8 , A13, A23
B	**Intellectual skills**	B2 , B5 , B7
C	**Professional and practical skills**	C3 , C17
D	**General and transferable skills**	D3, D5 , D6 ,D7

1 – Course teaching:

Topics	Lecture hours	Tutorial hours	Practical hours	Lecturer
• Operational Amplifiers Configurations	2	1	2	Dr. Hany Tawfik Kamel
Applications of Op-Amps	2	1	2	
Op-Amp Differentiator	2	1	2	
Op-Amp Integrator.	2	1	2	
Design of Op-Amp circuits	2	1	2	
Design of Digital to Analog Converter	2	1	2	
Diode Terminal Characteristic	2	1	2	
Design of Half wave & Full wave rectifier	2	1	2	
Diode circuits	2	1	2	
Dido applications (Clippers-clampers)	2	1	2	
BJT transistor circuits	2	1	2	
JFET Transistors	2	1	2	
JFET Trans- conductance & ac parameters	2	1	2	
CMOSFET Functions	2	1	2	
CMOSFET Applications	2	1	2	
Total hours	**30**	**15**	**30**	

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching methods						Learning methods			Assessment method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory &Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1	1	1	1			1			1		1	1	
	a2	1			1						1	1	1	1	
	a3	1			1									1	
	a4	1	1		1			1	1			1		1	
Intellectual Skills	b1	1						1			1	1	1	1	
	b2	1			1			1			1	1	1	1	
	b3	1			1				1					1	
	b4	1												1	
Applied Professional Skills	c1	1						1			1	1	1	1	
	c2	1			1	1		1			1		1	1	
	c3	1			1	1			1			1		1	
General Tran. Skills	d1			1					1				1		
	d2	1				1									
	d3	1				1			1				1		
	d4			1											

Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1- Microelectronics Circuits-1 "*Theoretical part*"

2- Microelectronics Circuits-1 "*Practical part*"

6-2 Required books

Malvino, ***Electronic Principles***, Macmillan Mc Graw Hill Inc, 1998.

6-3 Recommended books

Sedra-Smith, ***Microelectronics Circuits***, Oxford University Press, 1998.

6-4 Recommended web sites

1. **www.Sedra.com**
2. **www.Floyd.com**
3. **www.Mawino.com**

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer Lab. Installed with MATLAB program.

Course coordinator: *Prof. Dr. Hany Tawfik*
Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*
Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC313: Microelectronics Circuits-2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: October, 2013

B - Basic information

Title: Microelectronics Circuits-2 **Code:** ELC313 **Level:** Junior, Sixth Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:**2 **Practical:** 2
Pre-requisite: ELC312

C - Professional information

1 – Course Learning Objectives:

- Understand the BJT transistor structure and operations
- Understand the transistor biasing
- Analyze the transistor amplifier types.
- Analyze the frequency response at low and high frequencies.
- Analysis the power amplifier
- Understand the basic theory of oscillation.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1-Analysis the biasing methods of any BJT transistor circuit..**(A1, A3, A15)**
a2-Analysis the configurations of BJT. **(A1, A3 , A15)**
a3-Analysis the frequency response of Common emitter amplifiers. (**A1, A3, A4, A15)**
a4-Analysis the power amplifier .**(A1, A3,A4,A15)**
a5- Basic theory of oscillators and function generators.**(A1)**

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Design the bias of simple circuits. **(B2, B3.)**
b2- Deduce the frequency response at low and high frequencies transistor amplifier. **(B2)**
b3-Evaluate the performance of power amplifier. **(B2,B3,B5)**
b4- Identify/describe the oscillation theory. **(B2)**

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Measure the transistor characteristics**. (C1,C15)**
c2-Measure characteristics of transistor amplifier. **(C1,C7,C15)**

c3- Measure the frequency response of amplifiers. **(C1,C15)**
c4- Measure the power amplifier parameters .**(C1,C18)**

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1-Work in stressful environment and within constraints**(D2)**
d2-Communicate effectively through assignments. **(D3)**
d3- Effectively manage tasks, time, and resources. **(D6)**
d4-Search for information and engage in life-long self-learning discipline. **(D7)**
d5- Refer to relevant literatures**(D9)**

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	**Knowledge and understanding**	**A1, A3,A4,A15, A23**
B	**Intellectual skills**	**B2,B3,B5**
C	**Professional and practical skills**	**C1,C7,C15,C18**
D	**General and transferable skills**	**D2,D3,D6,D7,D9**

4- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1- Bipolar Junction Transistors.	1	1	1
2-The I-V curve of BJT.	1	1	٢
3- BJT Operating Regions.	1	1	٢
4-BJT Circuit Configurations**.**	6	4	٦
5- Transistor Amplifier.	8	8	١٠
6- Graphical Analysis.	1	2	٢
7-Frequency Response.	4	2	٢,٥
8-Amplifier Frequency Response.	4	3	١
9- Effect of Internal Transistor Capacitance.	2	4	١
10- Types of power amplifiers	1	1	٠,٥
11-Class A power amplifier.	1.5	2	١
12- Signal Generators& Wave shaping circuits**.**	0.5	1	١
Total hours	**30**	**30**	**30**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching methods						Learning methods			Assessment method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1	1	1		1	1	1	1	1	1		1	1	1
	a2	1	1			1	1	1			1	1	1	1	1
	a3	1	1			1	1						1	1	1
	a4	1	1			1			1			1	1	1	
	a5	1	1			1			1			1	1	1	
Intellectual Skills	b1				1	1	1	1			1		1	1	
	b2				1	1		1					1	1	
	b3				1	1	1	1	1			1	1	1	
	b4				1	1		1					1	1	
	b5				1	1		1					1	1	
Applied Professional Skills	c1						1								1
	c2						1								1
	c3						1								1
	c4						1								1
General Tran. Skills	d1						1								
	d2						1								
	d3						1								

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1- Microelectronics Circuits-2 "*Theoretical part*"

2-Microelectronics Circuits-2 "*Practical part*"

6-2 Required books

- Sedra-Smith, Microelectronics Circuits -6th ed., Oxford University Press, 2009.

6-3 Recommended books

- Jacob Millman, Microelectronics-9th ed, McGraw Hill series Jacob Milman, 2012.

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Electronics Lab.
- Computer Lab. Installed with MATLAB andOrcad programs.

Course coordinator:	*Dr. Eman Mohammed Mahmoud*
Head of the Department:	*Prof. Dr. MokhtarAbd El- Haleem*
Date:	20 / 7 / 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC314: Electronic Measurements

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the program: Electronic Engineering & Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

Department offering the course: Electronic Engineering & Communication Technology Department.

Academic level: Junior

Date of specifications approval: October, 2013

B - Basic information

Title: Electronic Measurements **Code:** ELC314 **Level:** Junior, Fifth Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2

Pre-requisite: ELC215

C - Professional information

1 – Course Learning Objectives:

- Understand the measurement techniques using different equipment
- Be familiar with the oscilloscope & use it to measure phase, voltage & frequency
- Understand the principle of operation of digital measuring equipment.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- The different types of oscilloscopes & electronic analog voltmeters. (A5, A15)

a2- The digital voltmeters circuits. (A5, A15)

a3- The digital frequency meter circuits. (A15)

a4- The distortion meter & spectrum analyzer. (A10, A15)

.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Analyze the technical problems and find a suitable solutions. (B3)

b2- Think in a scientific way to reach a certain imagination and new innovation. (B3)

b3- Give the correct decision and test his solutions. (B2)

b4- Create new ideas. (B12)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Design the special measuring circuits. (C20)

c2-Test electronic circuits using laboratory information. (C12, C15)

c3- Develop a system to get a better efficiency. (C3, C12)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1-Search for information's from references, journals and internet. (D7)

d2-Write technical reports and prepare convenient presentations. (D4)

d3-Use the Email for communication. (D6)

d4- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A5,A10,A15
B	Intellectual skills	B2, B3 ,B12
C	Professional and practical skills	C3, C12 , C15, C20
D	General and transferable skills	D4 ,D6 ,D7

2- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
Basics of digital instruments.	4	2	2
2- Time-base display systems, frequency meter system &measurements.	4	2	2
3- Errors &reciprocal counting, digital volt-meter and digital display.	2	2	2
4- Dual trace oscilloscopes, supplies, performance and testing	10	2	2
5- Signal generators, low frequency, pulses, RF & Frequency synthesizers.	2	2	2
6- Distortion analyzer, the Q-meter spectrum analyzer.	2	2	2
7- Measurement of physical quantities: Transducers, Displacement, Temperature, Photoelectric transducers.	4	2	2
8- Data A question system , A/D converters	2	1	1
Total hours	**30**	**15**	**15**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1	1	1	1		1			1	1		1	1	1
	a2	1	1	1	1	1	1	1			1	1		1	1
	a3	1	1		1	1	1	1					1	1	1
	a4	1	1		1		1		1			1		1	1
Intellectual Skills	b1	1	1	1	1	1	1		1	1	1		1	1	1
	b2	1	1	1	1	1	1	1			1	1		1	1
	b3	1			1		1	1	1				1	1	1
	b4	1			1		1		1			1		1	1
Applied Professional Skills	c1	1		1	1	1	1	1		1	1		1	1	1
	c2	1		1	1	1	1	1			1	1		1	1
	c3	1			1		1		1				1	1	1
General Tran. Skills	d1						1		1						
	d2	1		1			1			1	1		1	1	1
	d3	1		1			1				1	1		1	1
	d4						1		1						

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1- Electronic Measurements "*Theoretical part*"

2- Electronic Measurements "*Practical part*"

6-2 Required books

David A. Bell ,***Instrumentation & Measurement***, 2nd edition , 1994.

6-3 Recommended books

Larray D. Jones A. Foster Chin, ***Electronic Instruments and Measurements***, 2nd edition, Prentice Hall, Inc., 1991.

6-4 Recommended Web Site

www.LarryDJonesA.com

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer Lab. Installed with MATLAB program.
- Complete Lab for Electronic Measurements.

Course coordinator: *Prof. Dr. Hany Tawfik*

Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*

Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC315: Signal Analysis

A- Affiliation

Relevant program:	Electronic Engineering & Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Electronic Engineering & Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the course:	Electronic Engineering &Communication Technology Department.
Academic level:	Junior
Date of specifications approval:	October, 2013

B - Basic information

Title: Signal Analysis **Code:** ELC315 **Level:** Junior, Fifth Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial:**2 **Practical:** -

Pre-requisite: MTH305

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to introduce main principles of electrical signals based and its properties. By the aid of this course some important operations on signals will be discussed such as correlation, power and energy calculations. Fourier operations (series and transform) are vital for time and frequency domains representation of signal therefore, our course should contain both. Finally, random process will be displayed including random variable and random process transmission.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Various types of signal classifications. (A5, A24)

a2- Physical meaning of auto- correlation and cross- correlation between signals. (A5, A24)

a3- Difference between signal mathematical representation in time and frequency domains. (A5, A24)

a4- Properties of Fourier transformation. (A5, A24)

a5- Characteristics of linear system and features of signal distortion over linear and non- channels. (A5, A24)

a6- Basics of random process and random variables. (A5, A24)

a7- Some important definitions related to random variables such as; mean and covariance. (A5, A24)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Classify signal using many ways. (B2, B11)

b2- Apply signal transformation from time to frequency domains and vice versa. (B2**,** B11)

b3- Calculate signal energy and power. (B2**,** B11)

b4-Obtain mean and covariance functions for any random variable. (B2**,** B11)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Sketch signal waveform and spectrum for periodic function signals. (C1, C13)

c2- Design channel equalizer to combat both linear and non- linear channel distortion. (C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate with others; work in a team and involvement in group discussion and seminars (D3).
d2- Present data and results orally and in written form (D6, D9).
d3- Search for information's in references and in internet (D7).
d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	**Knowledge and understanding**	A5, A24
B	**Intellectual skills**	B2, B11
C	**Professional and practical skills**	C1, C13
D	**General and transferable skills**	D3, D6, D7, D9.

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1- Introduction to Signals, Classification of signals and Signal Operators.	٤	٤	-
2- Signal Comparison- Correlation..	٢	٢	-
3- Signal Representation by orthogonal signal set – Fourier series.	٢	٢	-
4- Analysis and Transmission of Signals.	٤	٤	-
5- A periodic Signal representation by Fourier Integral.	٤	٤	-
6- Transforms of same useful function and properties of Fourier Transform.	٢	٢	-
7- Signal transmission through linear system and signal distortion over spectral channel	٤	٤	-
8-Energy and power spectral densities. - Random processes.	٢	٢	-
9- Probability – Random variables – Statistical averages.	٢	٢	-
10- Mean – Correlation and Covariance function.	٢	٢	-
11-Transmission of Random process through linear filter.	٢	٢	-
12- Optimum Receiver – Mate fed filter receiver and correlation receiver.	٢	٢	-
Total hours	**30**	**30**	**-**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching methods						Learning methods			Assessment method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem Solving	Laboratory & Experiments	Brain Storming	Self Learning	Researches And Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1	1	1	1	1					1	1	1	1	
	a2	1	1	1	1	1					1			1	
	a3	1	1	1	1	1					1	1	1	1	
	a4	1	1	1	1	1								1	
	a5	1	1		1	1						1	1	1	
	a6	1		1	1	1				1				1	
	a7	1			1	1			1	1		1	1	1	
Intellectual Skills	b1	1			1	1		1			1	1	1	1	
	b2	1			1	1		1			1		1	1	
	b3	1			1	1		1				1	1	1	
	b4	1			1	1		1					1	1	
Applied Professional Skills	c1	1				1		1			1	1	1	1	
	c2	1				1		1			1	1	1	1	
General Tran. Skills	d1	1							1						
	d2	1							1						
	d3	1							1						
	d4	1							1						

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes

Signal Analysis (I) "*Theoretical part*"

6-2 Required books

1- B. Lathi, ***Modern Digital and Analog communication systems***, oxford press 1998.

2- *Electronic Communication systems*,: kendey,Davis Mc Graw-Hill Book

6-3 Recommended books

S. Haykin, ***Communication systems***, 4th edition J. W. 2001.

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator: *Dr. Nelly Muhammad Hussien*

Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*

Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC361: Seminar-1

A- Affiliation

Relevant program:	Electronic Engineering &Communication Technology BSc Program.
Department offering the program:	Electronic Engineering & Communication Technology BSc Program.
Department offering the course:	Electronic Engineering & Communication Technology BSc Program.
Date of specifications approval:	October, 2013

B - Basic information

Title: Seminar-1 **Code:** ELC361 **Level:** Junior, Fifth Semester

Credit Hours: 1 **Lectures:** - **Tutorial:** 1 **Practical: 2**

Pre-requisite: 90 Credits

C - Professional information

1 – Course Learning Objectives:

To increase our students' flexibility and reliability, The 2 courses of seminars are put to teach student to gain an understanding of a new field, in the absence of a textbook.

This course is one of those courses that aim to how research papers are written, how to read such papers (soft or hard copies) critically and efficiently, how to summarise and review them, and at last how to judge the value of different contributions.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Technical language and report writing (A10)

a2- Contemporary engineering topics (A12)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Plan, conduct and write a report on a project or assignment. (B14)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Use computational facilities, measuring instruments, workshops and laboratories equipment to design experiments and collect, analyze and interpret results (C5)

c2- Apply safe systems at work and appropriate steps to manage risks (C8)

c3-Prepare and present technical reports. (C12)

c4- Use relevant laboratory equipment and analyze the results correctly. (C15)

c5- Use appropriate tools to measure system performance. (C18)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Collaborate effectively within multidisciplinary team (D1)
d2-Work in stressful environment and within constraints (D2)
d3-Communicate effectively (D3)
d4-Lead and motivate individuals (D5)
d5- Search for information and adopt life-long self learning (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A10, A12
B	Intellectual skills	B14
C	Professional and practical skills	C5, C8, C12, C15, C18
D	General and transferable skills	D1, D2, D3, D5, D7

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory &Experiments	Brain stoming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1		X												
	a2			X						X			X		
Intellectual Skills	b1		X	X				X	X	X			X		
Applied Professional Skills	c1														X
	c2														X
	c3				X					X					X

	c4												X		X
	c5														X
General Tran. Skills	d1		X	X				X		X					X
	d2		X	X											X
	d3		X	X				X							X
	d4		X	X				X							X
	d5		X							X			X		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, assignments, reports, and lab work	Weekly	30
Oral exam	12th Week	70
Total		100

6- List of references:

6-1 Course notes

None

6-2 Required books

None.

6-3 Recommended books

None.

7- Facilities required for teaching and learning:

Lectures room equipped with OHP and data show facility.

Course coordinator: *Prof. Dr. Shuman El Shuman*

Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*

Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC362: Seminar-2

A- Affiliation

Relevant program:	Electronic Engineering &Communication Technology BSc Program.
Department offering the program:	Electronic Engineering & Communication Technology BSc Program.
Department offering the course:	Electronic Engineering &Communication Technology BSc Program.
Date of specifications approval:	October, 2013

B - Basic information

Title: Seminar-2 **Code:** ELC361 **Level:** Junior, Sixth Semester

Credit Hours: 1 **Lectures:** - **Tutorial:** 1 **Practical: 2**

Pre-requisite: 90 Credits

C - Professional information

1 – Course Learning Objectives:

To increase our students' flexibility and reliability, The 2 courses of seminars are put to teach student to gain an understanding of a new field, in the absence of a textbook.

This course is one of those courses that aim to how research papers are written, how to read such papers (soft or hard copies) critically and efficiently, how to summarise and review them, and at last how to judge the value of different contributions.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Technical language and report writing (A10)

a2- Contemporary engineering topics (A12)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Plan, conduct and write a report on a project or assignment. (B14)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Use computational facilities, measuring instruments, workshops and laboratories equipment to design experiments and collect, analyze and interpret results (C5)

c2- Apply safe systems at work and appropriate steps to manage risks (C8)

c3-Prepare and present technical reports. (C12)

c4- Use relevant laboratory equipment and analyze the results correctly. (C15)

c5- Use appropriate tools to measure system performance. (C18)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Collaborate effectively within multidisciplinary team (D1)

d2-Work in stressful environment and within constraints (D2)
d3-Communicate effectively (D3)
d4-Lead and motivate individuals (D5)
d5- Search for information and adopt life-long self learning (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A10, A12
B	Intellectual skills	B14
C	Professional and practical skills	C5, C8, C12, C15, C18
D	General and transferable skills	D1, D2, D3, D5, D7

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1		X												
	a2			X						X			X		
Intellectual Skills	b1		X	X				X	X	X			X		
Applied Professional Skills	c1				X					X					X
	c2												X		X
	c3														X
	c4														X
General Tran. Skills	d1		X	X				X		X					X
	d2		X	X											X
	d3		X	X				X							X
	d4		X	X				X							X
	d5		X							X			X		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, assignments, reports, and lab work	Weekly	30
Oral exam	12th Week	70
Total		100

6- List of references:

6-1 Course notes

None

6-2 Required books

None.

6-3 Recommended books

None.

7- Facilities required for teaching and learning:

Lectures room equipped with OHP and data show facility.

Course coordinator: *Prof. Dr. Shuman El Shuman*

Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*

Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC 410: Electrical Machines and Power

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program. Computer Engineering and Information Technology BSc Program.
Department offering the program:	Electronic Engineering and Communication Technology Department. Computer Engineering and Information Technology Department.
Department offering the course:	Electronic Engineering and Communication Technology Department.
Date of specifications approval:	October, 2012.

B - Basic information

Title: Electrical Machines and Power **Code:** ELC 410 **Level:** Senior 1, Seventh Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 1 **Practical:** 2

Pre-requisite: ELC 211

C - Professional information

1 – Course Learning Objectives:

A study of this course will enable the student to be familiar with all kinds of machines and transformers, and the application theory of their operations.

2 – Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Electrical power sources.(A1, A4)
a2- Construction of electrical transformer.(A14, A15)
a3- Theory of operation and applications of electrical transformer.(A5, A8)
a4- Construction of direct current machines; motors and generators. (A14, A15)
a5- Evaluation of power losses and efficiency of direct current machines.(A5, A8)
a6- Three phase induction machine construction, theory of operation, torque speed characteristics, speed control, equivalent circuit, and efficiency.(A5, A15)
a7- Synchronous machine operation, equivalent circuit, and voltage regulation. (A5, A14)
a8- Transmission line system. (A8, A15)
a9- Comparison between direct current transmission system and alternating current transmission system. (A6, A11)
a10- Transmission line modeling. (A3, A13, A16)
a11- Electrical power distribution for direct current system and alternating current system. (A6, A7, A13)
a12- High voltage transmission lines and underground cables. (A11, A15)
a13- Understand the principles of power converter operations. (A5, A16)

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Find the equivalent circuits of transformer and machines. (B11)
b2- Allocate any fault and know its reason. (B6, B9)
b3- Calculate the suitable machine parameters necessary for specific load. (B2)
b4- Choose the suitable operating torque-speed point for best machine performance. (B3)

b5- Calculate transformer and machines efficiency. (B2)
b6- Control the speed and torque of DC and AC motors. (B1, B2)
b7- Design a simple transformer. (B3)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Measure equivalent circuit parameters of transformer and machines. (C1, C5)
c2- Measure efficiency of transformer and machines. (C1, C5)
c3- Measure voltage-current characteristics of generators. (C1, C4, C5)
c4- Measure torque-speed characteristics of motors. (C1, C4, C5)
c5- Control torque-speed characteristic of three phase induction machines. (C8)
c6- Test synchronous generator synchronization with grid. (C8)
c7- Use power electronics for motor speed control. (C2, C5)

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1- Communicate affectivity through assignment. (D3)
d2- Work in stressful environment and within constraints. (D2)
d3- Effectively manage tasks, time, and resources. (D6)
d4- Search for information and engage in life-long self-learning discipline. (D7)
d5- Use the software packages to show the applications of all kinds of power converters. (D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4,A5, A6, A7, A8, A11, A13, A14, A15
B	Intellectual skills	B1, B2, B3, B6, B9, B11
C	Professional and practical skills	C1, C2, C4, C5, C8
D	General and transferable skills	D2, D3, D6, D7, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Circuit analysis of transformers.	3	1	-
➢ Transformer construction.	2	-	2
➢ Equivalent circuit of a transformer.	2	1	4
➢ Transformer test.	2	2	4
➢ Construction of DC machine.	2	-	1
➢ Classification of DC machine.	2	1	4
➢ Circuit equations of DC machine.	2	2	2
➢ DC machine efficiency.	2	1	2
➢ Construction of induction motors.	2	-	1
➢ Torque-speed characteristics.	2	2	3
➢ Efficiency of induction motor.	1	1	2
➢ Construction of synchronous machine.	2	-	1

➢ Circuit equations of synchronous machine.	2	2	-
➢ Operation synchronous machine.	2	1	2
➢ Types of power converters.	1	-	-
➢ Application and operation of power converters.	1	1	2
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1					1			1	1	1	1	1
	a2	1	1				1	1		1		1	1	1
	a3	1			1	1				1			1	1
	a4	1	1			1				1		1	1	1
	a5	1			1	1				1	1	1	1	1
	a6	1	1		1	1	1	1					1	1
	a7	1	1		1	1								
	a8	1	1					1						
	a9	1			1	1								
	a10	1			1	1								
	a11	1				1								
	a12	1				1								
	a13	1			1	1								
Intellectual Skills	b1	1			1					1	1	1	1	1
	b2	1					1			1	1	1	1	1
	b3	1			1					1			1	1
	b4				1		1			1			1	1
	b5	1			1		1			1		1	1	1
	b6	1			1		1			1		1	1	1
	b7				1		1			1			1	1
Applied Professional Skills	c1						1				1			
	c2						1					1	1	1
	c3						1							
	c4						1				1			
	c5	1					1							
	c6						1							

	c7	1					1							
General Tran. Skills	d1				1									
	d2						1				1			
	d3				1									
	d4	1					1				1			
	d5						1							

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10%
Mid-Term Exam	8-th Week	10%
Practical Exam	Fifteenth week	20%
Written Exam	Sixteenth week	60%
Total		100%

6- List of references:

6-1 Course notes:

- S. A. Gawish, ***Electrical Machines & Power***, Cairo, 2008.
- S. A. Gawish, ***Electrical Machines & Power***, Practical Part, Cairo, 2008.

6-2 Required books

- Stephan J. Chapman, ***Electrical Machinery Fundametals***, 4th edition, Mc Graw-Hill, 2005.

6-3 Recommended books:

- A. E. Fitzgerald, C. Kingsley, and S.D.U. man, ***Electrical Machinery***, 6th edition, 2003.

6-4 Periodicals, Web sites, etc.

- Eductional CD.
- http://www.slideshare.net/jayleong111/electrical-machines-drives-and-power-systems.
- http://www.amazon.com/Electrical-Machines-Drives-Systems-Edition/dp/0131776916.

7- Facilities required for teaching and learning:

- Electrical Machines Lab.
- Data Show.

Course coordinator: Prof. Dr. Said A. Gawish.
Head of the Department: Prof. Dr. Said A. Gawish.
Date: 1 / 7 / 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC 420:Control- 2 (Digital and PLC Control)

A- Affiliation

Relevant program: Electronic Engineering &Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department
Date of specifications approval: October, 2013

B - Basic information

Title: Control –2 **Code:** ELC 420 **Level:** Senior-1, Eighth semester
Credit Hours: 4 **Lectures:**3 **Tutorial:**1 **Practical:**2
Pre-requisite: ELC 310

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to enable the students to model, analyze the performance of linear Discrete-time control systems, design appropriate controllers to achieve the required performance, and acquire the necessary knowledge related to principles of programmable logic control "sequential control " .

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Theoretical background needed to develop and solve linear time-invariant difference equations (as a model for digital system) using Z-transform (A1).

a2- Concept of pulse transfer function of linear system and algebra of block diagrams incorporate samplers (A1,A5).

a3- Analysis and performance evaluation of digital control system: transient response, steady state error "accuracy", and stability (A16).

a4- Procedures of design of digital controllers to achieve the required system performance (A4,A16).

a5- Procedure of modeling the digital control systems in state-space form and solution of discrete-time state-space equations (A1,A5, A16).

a6- Concepts and basics of using PLCS as controller for discrete-time control systems (A8).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Deduce the mathematical models and pulse transfer functions for discrete-time control systems (B1,B13).

b2-Investigate time response, steady state error, and stability of digital control system (B1,B2,B13).

b3- Investigate how to improve the digital control system performance (transient response, steady state error, stability) by design of an appropriate controller (B3,B5,B7).

b4 - Investigate the digital control system performance using root locus method and pole placement technique (B1,B2,B13).

b5-Deduce the state-space model of discrete-time system and the state estimator algorithm" Observer" (B1,B2,B7).

b6 – Investigate how to program the PLCS as controller for a discrete systems (B1,B7,B12).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Solve linear time-invariant difference equations using the Z-transform and obtain the Z-transfer function of LTI system (C1,C12).

c2- Construct, test, and investigate the performance characteristics of closed loop digital control system (C1, C12).

c3- Determine the time response parameters "transient , steady state" and stability for digital control systems (C1, C12).

c4- Design of proper digital controller in the Z-domain using the root-locus method (C1, C2, C3, C12).

c5- Design state F.B. control using pole placement method, and state estimators for state-space models (C1, C2, C3, C12).

c6- Use experimental facilities to investigate the digital control system performance (C5, C11, C14, C17).

c7- Carry out basic programming of PLCS as controller for discrete-time systems (C5,C6,C13).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Search for information in reference and internet (D7).

d2- Present data and results orally and in written form (D3, D9).

d3- Communicate with others, work in a team and involvement in group discussion and seminars (D1,D3).

d4- Practice self learning (D7,D9).

Course Contribution in the Program ILO's:

ILO's		Program ILO's
A	Knowledge and understanding	A1,A4,A5,A8,&A16
B	Intellectual skills	B1,B2,B3,B5,B7,B12,&B13
C	Professional and practical skills	C1,C2,C3,C5,C6,C11,C12,C13,C14,&C17
D	General and transferable skills	D1,D3,D7,&D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Introduction to discrete-time control system & A/D and D/A conversion.	4	2	4
➢ Z- transform and inverse Z- transform for solving of linear difference equations.	8	2	
➢ Z- plane analysis of discrete-time control systems (Impulse sampling , Pulse transfer function, and Modeling of digital controllers).	8	2	8
➢ Stability criterion " Jury test " for closed-loop control system in the Z-plane.	3	1	
➢ Transient and steady-state response characteristics of discrete-time control system & effects of disturbances.	4	1	4
➢ Steady-state error analysis of discrete-time control system.	2	1	4
➢ State-space analysis of discrete-time control system (State-space equation of discrete-time systems, Pulse transfer matrix, and Solving of linear discrete-time state equation).	4	2	2
➢ Pole placement and state estimation "Observers" of discrete systems.	6	2	
➢ Sequential control "discrete-state controller" using PLC's (Basic structure & Ladder diagrams).	4	2	4
➢ Transducers in industrial application.	2		4
Total hours	**45**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Methods							
		Lecture	Laboratory & Experiments	Discussions &Seminars	Tutorials	Problem solving						Modeling	Researches & Reports						Quizzes	Assignments	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1			1								1						1		1		1
	a2	1			1	1							1						1		1		1
	a3	1	1		1	1						1	1						1		1	1	1
	a4	1	1		1	1						1	1						1	1	1	1	1
	a5	1			1								1						1	1	1		1
	a6	1	1		1	1						1	1						1		1	1	1
Intellectual Skills	b1	1			1	1						1	1						1		1		1
	b2	1	1		1							1	1						1		1	1	1
	b3	1	1		1	1						1	1						1	1	1	1	1
	b4	1			1								1						1	1	1		1
	b5	1			1	1							1						1		1		1
	b6	1	1		1							1								1	1	1	1
Applied Professional Skills	c1	1			1								1						1		1		1
	c2	1	1		1	1						1	1						1	1	1	1	1
	c3	1			1	1							1						1	1	1		1
	c4	1			1	1						1	1						1	1	1		1
	c5	1			1	1							1							1	1		1
	c6	1	1		1							1								1	1	1	1
	c7	1	1		1	1						1								1	1	1	1
General Tran. Skills	d1				1	1							1										
	d2	1	1		1								1							1	1	1	1
	d3	1	1										1										
	d4												1							1	1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes& Reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Lecture notes and handouts

6-2 Required book :

M.Sami Fadali& A.Visioli, ***Digital Control Engineering. Analysis and Design***, Elsevier Inc., 2009.

6-3 Recommended books:

- K.Ogata, ***Discrete-Time Control Systems***, Prentice-Hall. INC, 1995.
- Charles L. Phillips, H. Troy Nagle, ***Digital Control System Analysis and Design***, Prentice- Hall.INC, 1995.
- Curtis D. Johnson, ***Process Control Instrumentation Technology***, Prentice-Hall of India, 2003.

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

- Automatic control Lab & Process control Lab.
- Computer, Computer programs, and MATLAB.
- PLC training kit.

Course coordinator: Prof. Dr.Magdy O. Tantawy
Head of the Department: Prof. Dr.MokhtarAbd El- Haleem
Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC421: Communications-2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program

Department offering the program: Electronic Engineering & Communication Technology Department

Department offering the course: Electronic Engineering & Communication Technology Department.

Date of specifications approval: October, 2013

B - Basic information

Title: Communications-2 **Code:** ELC421 **Level:** Senior 1, Seventh Semester

Credit Hours: 4 **Lectures:** 3 **Tutorial:**1 **Practical:** 2

Pre-requisite: ELC311

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to introduce main principles of pulse communication systems including analog and digital types. In addition, concept of random noises will be introduced including different types of random noises based on noise source. This leads us to explain behavior of different communication systems in presence of noise.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Principles of pulse communications system. (A24).

a2- Various types of analog pulse modulation techniques: PAM, PWM, and PPM. (A18, A24).

a3- Various types of digital pulse modulation techniques; PCM and DPCM. (A18, A24)

a4- Stages of Radio communication system. (A27)

a5- Comparative study for different types of digital CW modulation techniques; ASK, PSK, and FSK. (A27)

a6- Internal and external sources of random noises – noise voltage and equivalent temperature calculation. (A18, A24)

a7- Performance of analog and digital comm. systems in the presence of random noises. (A24, A27)

.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Sketch sampled signals in both time and frequency domains using different forms of sampling. (B15, B19)

b2- Determine signal waveform obtained at the output of each stage in PCM system. (B15, B19)

b3- Take decision about suitable analog pulse modulation technique based on service needs and channel features. (B15, B19)

b4- Take decision about suitable digital pulse modulation technique based on service needs and channel features. (B15, B19)

b5- Estimate probability of error obtained in the presence of noise channel using different digital modulation techniques. (B15, B19)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Construct and / or connect circuits for FDM multiplexing / de-multiplexing. (C19, C20)
c2- Construct and / or connect circuits for different pulse modulation and TDM systems. (C19, C20)
c3- Construct and / or connect circuits for A/D and D/A converters. (C19, C20)
c4- Construct and / or connect circuits for different types of digital radio (ASK, FSK, PSK). (C19, C20)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate with others; work in a team and involvement in group discussion and seminars (D3).
d2- Present data and results orally and in written form (D6).
d3- Search for information's in references and in internet (D7).
d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A18, A24, A26, A27
B	Intellectual skills	B15, B19
C	Professional and practical skills	C19, C20
D	General and transferable skills	D3, D6, D7

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Introduction to sampling process.	5	1	0
2-Analog pulse modulation techniques: PAM, PWM, and PPM.	10	4	10
3- Pulse code modulation PCM.	4	2	6
4-Differential Pulse code modulation DPCM.	4	2	0
5-Digital radio communication systems.	2	1	4
6-Modulation techniques used in digital radio comm. systems: ASK, FSK, PSK, QAM, and DPSK.	10	3	10
7-Carrier recovery.	3	0	0
8-Internal and external sources of random noises – noise voltage and equivalent temperature calculation.	4	2	0
9-Performance of analog and digital comm. systems in the presence of random noises.	3	0	0
Total hours	**45**	**15**	**30**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory &Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1		1							1			1	
	a2	1	1	1	1	1		1			1	1	1	1	
	a3	1	1	1	1	1		1			1		1	1	
	a4	1		1					1	1		1	1	1	
	a5	1	1	1	1	1		1					1	1	
	a6	1		1	1	1		1				1	1	1	
	a7	1	1	1					1	1				1	
Intellectual Skills	b1	1			1	1		1			1		1		
	b2	1			1	1		1			1	1	1	1	
	b3	1			1	1		1			1		1	1	
	b4	1			1	1		1				1	1	1	
	b5	1			1	1		1				1		1	
Applied Professional Skills	c1						1	1							1
	c2						1	1							1
	c3						1	1							1
	c4						1	1							1
General Tran. Skills	d1						1								
	d2						1								1
	d3								1	1					
	d4								1	1					

4- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1-Communications (II) "*Theoretical part*"

2- Communications (II) "*Practical part*"

6-2 Required books

1- G-Miao, ***Signal Processing in Digital Communications***, Arlech House, 2007.

2- J. Minkoff, ***Signal Processing Fundamentals and Applications for Communications and Sensing systems***, Alech-House, 2002.

6-3 Recommended books

- S. Proakis ,***Digital Communications***, McGraw-Hill Book Comp, 2001.

6-4 Recommended Web Site

https://en.wikipedia.org/wiki/Communications_system

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator: *Prof. Dr. Adel El- Sherif*

Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*

Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC 422: Digital Signal Processing

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology. BSc Program
Department offering the program: Electronic Engineering and Communication Technology. Department
Department offering the course: Electronic Engineering and Communication Technology. Department
Date of specifications approval: September, 2015

B - Basic information

Title: Digital Signal Processing **Code:** ELC 422 **Year/level:** Senior 1, Second semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical**: 2
Pre-requisite: MATH 203, CMP 211

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the basic concepts & theory of Signals, Systems, signal Processing and discrete transformations and digital filters. They should be able to design, calculate and analyze the performance of digital systems.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- the principles and concepts of digital signal processing (A8, A24).
a2- the concept of Analog-to-Digital and Digital-to-Analog Conversion (A2).
a3- the concept of Discrete Transformations (FS, FT, DFT, FFT and z-Transform) (A5).
a4- the concept of Digital Filters design (FIR & IIR), (A10).

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- select appropriate transformation (FS, FT, DFT or FFT), (B1).
b2- solve engineering problems using the concepts of Z-Transform in DS Processing (B7, B14).
b3- logically analyze the digital systems (B11 & B15).
b4- join the different topics in this subject to design a good new digital system (B3, B14).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- discriminate between different signal types (C2).
c2- use the gained Lab information in this subject to design numerous of digital signal processing systems, e.g., A/D, D/A converters and DSP processor (C2, C5, C15).
c3- design different digital filters (FIR&IIR), (C2, C5, C14).
c4- develop some DSP systems to attain high qualified system (C6).
c5- prepare and present works both in written & oral form (C12).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- search for information from references and internet (D7).

d2- communicate effectively and present data and results orally and in written form(D3).

d3- use ICT facilities in presentations (D4).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A5, A8, A10 & A24
B	Intellectual skills	B1, B3, B7, B11, B14 & B15
C	Professional and practical skills	C2, C5, C6, C12, C14 & C15
D	General and transferable skills	D3, D4 & D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Signal, system and signal processing	1	1	2
• Classification of signals	1	-	2
• The concept of frequency in continuous-time and discrete-time signals.	2	-	2
• Analog-to-digital and digital-to-analog conversion	1	-	2
• Fourier series (FS) and Fourier Transform (FT)	1	1	2
• Discrete Fourier Transform (DFT) and its inverse	2	4	4
• Computational complexity of the DFT	4	4	2
• Autocorrelation, cross-correlation, and convolution	4	6	4
• Z- transform and its inverse	4	4	-
• Properties of the Z-transform	2	-	-
• Application of Z-transform in DSP	2	4	-
• Design of the digital filters	-	6	2
• Types of the digital filters and choosing between them	2	-	-
• FIR filter design	2	-	4
• IIF filter design	2	-	4
Total	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Brain storming	Self Learning	Researches and Reports		Midterm	Quizzes	Assignments	Written Exam	Practical Exam			
Knowledge & Understanding	a1	1			1		1						1	1		1	1	1	1	1			
	a2	1		1	1		1							1		1	1	1	1	1			
	a3	1		1	1	1	1							1		1	1	1	1	1			
	a4	1	1	1	1	1	1						1	1			1	1	1	1			
Intellectual Skills	b1	1		1	1	1								1		1	1	1	1				
	b2	1		1	1	1	1					1	1	1			1	1	1				
	b3	1		1	1	1						1	1				1	1	1	1			
	b4	1					1						1	1			1	1		1			
Applied Professional Skills	c1	1			1	1	1						1	1		1	1	1		1			
	c2	1		1	1		1					1		1		1	1	1	1				
	c3	1	1	1	1	1	1						1	1			1	1	1	1			
	c4	1		1			1						1	1			1	1					
	c5	1	1	1			1						1	1			1	1					
General Tran. Skills	d1												1	1				1					
	d2	1											1	1				1		1			
	d3		1	1										1				1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes & Reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course Notes:

- Digital Signal Processing "*Theoretical part*"
- Digital Signal Processing "*Practical part*"

6-2 Essential Books (Text Books)

- Emmanuel C. Ifeachor and Barriew W. Jervis," Digital signal processing" A practical Approach ", 2nd Ed, prentice-Hall 2002.
- Joun G. proakis and Dimitris G. Manolkis, "Digital signal processing: principles, Algorithms, and Applications", 3rdEd, Macmillman Publishing Compay 1992.

6-3 Recommended Books

- Ashok Ambardar, "Analog and Digital signal processing ",2nd Edition, Brooks/Cole publishing Company,1999
- Sanjit K. Mitra, "Digital Signal Processing: A computer Based Approach", 3rd Ed., McGraw-Hill. International Edition, 2006.

6-4 Periodicals, Web Sites, etc.

- http://www.amazon.com/Digital-Signal-Processing-Practical-Approach/dp/0201596199.
- http://en.wikipedia.org/wiki/Digital_signal_processing.
- http://www.dspguru.com/dsp/links

7- Facilities Required for Teaching and learning

- Lectures room equipped with OHP and data show facility.
- Computer Lab installed by DSP Kits and MATLAB software.

Course coordinator: Dr. Samir Kamal
Head of the Department: Prof. Dr. Mokhtar Abd El Haleem
Date: September, 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC423: Electromagnetic Field Theory

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology. BSc Program
Department offering the program: Electronic Engineering and Communication Technology. Department
Department offering the course: Electronic Engineering and Communication Technology. Department
Date of specifications approval: September, 2015

B - Basic information

Title: Electromagnetic Field Theory **Code:** ELC 423 **Level:** Senior 1, Seventh Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 3 **Practical:** 0
Pre-requisite: PHY102

1 – Course Learning Objectives:

A study of this course will enable the student to:

- Understand the basic concept of static force, field, potential Power, Energy and capacitance.
- Solution of electrostatic problems by image methods, and Laplace equations by applying boundary conditions.
- Understand the basic concept of static magnetic field, force, circuits, and inductance.
- Understand the basic concept of time-varying field and Maxwell's Equations.
- Understand the basic concept of uniform plane wave.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- The concept of electrostatic field. (A1, A21)
a2- The concept of magneto-static field. (A1, A21)
a3- Electric field in dielectric and lossy medium (A1, A21)
a4-The capacitance and inductance of different electric and magnetic circuits. (A1, A21)
a5- The Time-varying field and Maxwell's Equations. (A1, A21)
a6-The concept of electromagnetic plane-wave and its propagation. (A1, A21).

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Solve an electrostatic problem related to a specific application. . (B1, B2)
b2-Solve a magneto-static problem related to a specific application . (B1, B2)
b3- Use the Maxwell equation for electromagnetic wave analysis. . (B1, B2)

c - Professional and practical skills:

On successful completion of the course, the student should be able to.
c1- Solve a simple electromagnetic problem related to a specific application. (C1, C2)
c2- Represent electromagnetic field in free space. (C1,C2)

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1-Solution of field problem sets individually.(D6)
d2-Demonestrae practical application of electric and magnetic fields.(D6)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5, A20
B	Intellectual skills	B1, B2
C	Professional and practical skills	C1,C2
D	General and transferable skills	D6

3- Contents:

Contents	Lecture hours	Tutorial hours
1- Basics concepts of Electrostatic field .	6	6
2- Methods of Solution of electrostatic problems.	6	14
3- The steady current field and resistance.	2	4
4- Basics concepts and Laws of The steady magnetic field	3	4
5-Solution of Steady Magnetic problems.	4	6
6- Time varying field and Maxwell's equations Faraday's law and displacement	5	5
7- Plane wave propagation in different media.	4	6
Total hours	30	45

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1		1	1	1		1	1	1	1	1	1	1	
	a2	1		1	1	1		1	1	1	1	1	1	1	
	a3	1		1	1	1		1	1	1	1	1	1	1	
	a4	1		1	1	1		1	1	1	1	1	1	1	
	a5	1		1	1	1		1	1	1	1	1	1	1	
	a6	1		1	1	1		1	1	1	1	1	1	1	

Intellectual Skills	b1	1		1	1	1		1	1	1	1	1	1	1	
	b2	1		1	1	1		1	1	1	1	1	1	1	
	b3	1		1	1	1		1	1	1	1	1	1	1	
Applied Professional Skills	c1	1		1	1	1		1	1	1	1	1	1	1	
	C2	1		1	1	1		1	1	1	1	1	1	1	
General Tran. Skills	d1	1		1	1	1		1	1	1	1	1	1	1	
	d2	1		1	1	1		1	1	1	1	1	1	1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-weekly	20
Attendance		10
Mid-Term Exam	6-th Week	10
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

Electromagnetic Field Theory.

6-2 Required books

Nannapneni Narayana Rao , ***Elements of Engineering Electromagnetic***, Prentice Hall, Inc., New Jersey, 1997.

6-3 Recommended books

David k. Cheng ,***Field and wave electromagnetic*** , Addison Wesley, 1989.

6.4 Periodicals, Web sites, etc.

- https://en.wikipedia.org/wiki/Electromagn
- http://www.britannica.com/science/electro
- http://nptel.ac.in/courses/108106073/

7- Facilities required for teaching and learning:

Computer lab

Course coordinator: Dr. Muhammad El-Wakeel
Head of the Department: Prof. Dr. Mokhtar Abd El Haleem
Date: September, 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC424: Microwave Engineering

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: October, 2013

B - Basic information

Title: Microwave Engineering **Code:** ELC424 **Level:** Senior 1, Eighth Semester
Credit Hours: 4 **Lectures:** 3 **Tutorial:**1 **Practical:** 2
Pre-requisite: ELC423

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the fundamental concepts of microwave theory and measurements.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Basic equations of microwave field in case of propagation in free space and dielectric. (A20, A21)
a2- TE, TM mode analysis in rectangular and circular waveguides. (A20)
a3- Power calculation in waveguide systems considering conductor and dielectric losses. (A20)
a4- Smith chart analysis and its application in transmission lines. (A20)
a5- Matching techniques using impedance transformers (binomial-Tshebyshev). (A20)
a6- Basic microwave measurements (wavelength, VSWR, power and impedance). (A20)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Identify the studied microwave transmission lines and waveguides. (B16)
b2- Investigate how to improve the voltage standing wave ratio in microwave systems. (B18)
b3- Deduce attenuation constant fort typical microwave transmission systems. (B15)
b4- Deduce mathematical models for typical impedance transformers. (B18)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Construct, test and investigate the performance of typical microwave transmission systems (C20)
c2- Design of matching circuit for a given load. (C17)
c3- Design of waveguide or coaxial line for given frequency and power. (C17)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1-Search for information from references, journals, and internet. (D6, D9)
d2-Effectively manage tasks, time, and resources. (D6, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A20,A21
B	Intellectual skills	B15,B16,B18
C	Professional and practical skills	C17,C20
D	General and transferable skills	D6, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Plane wave reflection from a media interface (parallel and perpendicular polarization).	7	1	4
2- Rectangular and circular waveguides TE, TM modes (analysis – design and applications).	10	3	6
3- Coaxial line and micro strip line (low – frequency and high – frequency solutions)	8	3	6
4-Attenuation due to conductor and dielectric loss.	5	2	4
5- Field analysis of transmission lines (traveling and standing waves).	5	2	4
6-Smith chart and impedance matching (single stub and double stub tuners).	10	4	6
Total hours	**45**	**15**	**30**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method					
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Modeling	Midterm	Quizzes	Seminars	Reports	Written Exam	Practical Exam
Knowledge & Understanding	a1	1			1	1			1		1			1	1	
	a2	1			1	1					1	1			1	
	a3	1		1	1	1					1			1	1	
	a4	1		1	1	1									1	
	a5	1			1	1						1			1	

	a6	1			1	1										1
Intellectual Skills	b1	1			1										1	
	b2	1			1											1
	b3	1			1										1	
	b4	1			1					1			1			
Applied Professional Skills	c1	1			1	1	1							1		
	c2	1			1	1	1									
	c3	1			1	1	1							1		
Gen. Tran. Skills	d1								1					1		
	d2								1					1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1- Microwave Engineering "*Theoretical part*"

2- Microwave Engineering "*Practical part*"

6-2 Required books

D.M. Pozar, ***Microwave Engineering***, John Wiley & sons, Inc., 2005.

6-3 Recommended books

R.E Collin, ***Foundations for Microwave Engineering,*** Second edition, Mc Graw Hill, N.Y, 1992.

6-4 Web sites

www.microwaveresearch.com
www.wavelineinc.com
www.maximintegrated.com

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer lab installed by MATLAB and ORCAD software.

Course coordinator: *Prof. Dr. Mokhtar Abd El- Haleem*
Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*
Date: September, 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC432: Optical Fiber Communications

A- Affiliation

Relevant program: Electronic Engineering &Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: October, 2013

B - Basic information

Title: Optical Fiber Communications **Code:** ELC٤٣٢ **Level:** Senior 1, Seventh Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

The main objects of this course is to introduce the nature of optics and the physics as particles and wares, fundamentals of optical fiber communication, and light, laser semiconductor sources detectors.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Design and implementation of limited range optical fiber system. (A25)
a2- Selection of proper light source and kind of modulation. (A22, A24)
a3- Selection of light detector and construction of optical receiver. (A22, A25)
a4- Noise analysis, power budget & bandwidth budget of the system. (A24, A25).

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Investigate of optical transmitters for analog and digital communication. (B12)
b2- Investigate of optical receivers for analog and digital communication. (B12)
b3- Investigate of distortion in optical fibers. (B12)
b4- Identify bandwidth and power requirements. (B2, B17)
b5- Judge the optical communication system requirement. (B2, B17)
b6- Identify the studied system given the specification requirements. (B12, B17)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- construct of an optical communication system. (C15, C18)
c2- Measure and evaluate the optical system performance. (C15, C18)
c3- Use experimental facilities to investigate System performance. (C15, C18)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in stressful environment and within constraints. (D2)
d2- Effectively manage tasks, time, and resources. (D6)
d3- Search for information and engage in life-long self-learning discipline. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A22, A24, A25
B	Intellectual skills	B2, B12, B17
C	Professional and practical skills	C15, C18
D	General and transferable skills	D2, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Constituents of optical fiber communication system: • Electromagnetic wave spectrum and blackbody radiation. • Power transfer evaluation throughout the system. • Radiometry of power quantities.	4	-	4
2. Concept of fiber optics as information channel: • Dispersion in fiber optics and rate of data limitations. • Types of optical cables. • Methods of fabrication.	8	2	4
3. Optical components and integrated wave guide: • Propagation and cavity resonators. • Optical couplers.	8	4	6
4. Light sources: • Point and extended sources. • Blackbody sources. • LED and LD. • Spectrum of LD and LASER sources.	4	4	6
5. Light detectors and Noise generator in the detectors.	4	3	6
6. System design and selection of individual components: • Power budget and frequency budget.	2	2	4
TOTAL	**30**	**15**	**30**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1									1			1	
	a2	1						1			1	1	1	1	
	a3	1	1	1		1		1				1	1	1	
	a4	1	1	1		1		1	1			1	1	1	
Intellectual Skills	b1	1			1	1		1			1	1	1	1	
	b2	1			1	1		1			1	1	1	1	
	b3	1			1	11		1			1	1	1	1	
	b4	1			1	1		1				1	1	1	
	b5	1			1	1		1						1	
	b6	1			1	1		1						1	
Applied Professional Skills	c1						1								1
	c2						1								1
	c3						1								1
General Tran. Skills	d1								1						1
	d2								1	1					
	d3								1	1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

- Optical Fiber Communications "Theoretical Part"
- Optical Fiber Communications "Practical Part"

6-2 Required books

- Joseph PALAIS, ***fiber optical communication***; 4th edition, 2002.

6-3 Recommended books

- GredKeiser, ***Optic fiber communications***, McGraw HII; 3rd edition.
- R Hudson, ***Infrared Engineering System***, AC press; 1967

6-4 Recommended Web Site

- **www.ieeexplore.ieee.org**

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Complete Lab for optical fiber communications.

Course coordinator:	Dr. Abdel Moneam Elmahdy
Head of the Department:	*Prof. Dr. Mokhtar Abd El- Haleem*
Date:	August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC433: Radar System and Remote Sensing

A- Affiliation

Relevant program: Electronic Engineering &Communication Technology BSc Program

Department offering the program: Electronic Engineering & Communication Technology Department

Department offering the course: Electronic Engineering & Communication Technology Department.

Date of specifications approval: October, 2013

B - Basic information

Title: Radar System and Remote Sensing **Code:** ELC 433 **Level:** Senior 1, Eighth Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial:** 3 **Practical:** -

Pre-requisite: ELC315

C - Professional Information

1 – Course Learning Objectives

By the end of this course the students should demonstrate the knowledge and understanding of the basic principles and concepts for analysis of performance for different types of radar systems and its applications.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and Understanding

By the end of the course the student should demonstrate the knowledge and understanding of:

a1-classification and theories underlying different radar systems-CW & Pulse radars- (A2, A4, A20, A28)

a2- basic radar range equation and main parameters and factors that influence the maximum range of radar system (A1, A18, A21, A28).

a3- construction, operation and characteristics of basic components of different radar systems (A4, A18, A20, A24) .

a4- basic techniques used for radar tracking of targets-mono-pulse & split gate systems- (A2, A20, A28).

a5- basic techniques used for radar remote sensing-SAR- (A2, A4, A24, A28).

B - Intellectual Skills

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

b1-investigate the effect external and internal parameters of radar system on the radar maximum range (B4, B5).

b2-evaluate the losses budget of the radar system, and its contribution on range of radar (B2, B5).

b3-invistigate how to improve the signal to noise ratio in pulse radars to increase the probability of detection of targets (B4, B17).

b4-identify the decision threshold level required to decide between targets and false alarm (B2, B15).

C - Professional and Practical Skills

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

c1-analyze and investigate the performance of typical radar system- surveillance radar, tracking radar-(C1, C2).

c2-design and select the proper values of main parameters of radar subsystems (transmitter, antenna,.. receiver) to achieve certain system performance (C1, C2).

D - General and Transferable Skills

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

d1- Search for information's from references, journals and internet (D7).

d2- Write technical reports and prepares convenient presentations (D1, D4).

d3- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A2,A4,A18,A20,A21,A24,A28
B	Intellectual skills	B2,B4,B5,B15,B17
C	Professional and practical skills	C1, C2
D	General and transferable skills	D1,D4,D7,D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to Radar systems 1. Basic Radars (pulse &CW radars)& Simple form of pulse radar equation. 2. Radar system (pulse & CW) – construction- block diagrams. 3. Application of radar systems (military & civilian).	8	4	__
• The Pulse Radar Range Equation 1. Receiver Noise & S/N. 2. Noise Figure & Effective Noise Temp. 3. Probability of detection and False Alarm. 4. Integration of radar echo pulses. 5. Target radar cross section fluctuation (Swerling Model). 6. De-correlation of target echos. 7. Analysis of parameters of radar equation. 8. Radar system losses. 9. Surveillance-Radar range Equation	24	14	__
• Tracking Radar 1. Types of tracking Radar Systems 2. Amplitude Comparison mono-pulse. 3. Two-channel amplitude compression mono-pulse. 4. Phase-comparison mono-pulse. 5. Conical scan and sequential lobbing. 6. Tracking by division of target echo envelop.	16	4	__
• Secondary Surveillance Radar: 1. Basic principles. 2. Problems with Secondary Surveillance Radar. 3. Multipath.	6	4	__
• Radar Subsystems 1. Synchronizers 2. Radar transmitters 3. Radar Receivers.	2	2	__
• Remote Sensing Radar	4	2	__
Total	60	30	__

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method			
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Site Visits	Quizzes & Presentations	Assignments	Written Exam	Practical Exam
Knowledge	a1	1		1	1			1			1	1	1	
	a2	1			1			1			1	1	1	
	a3	1			1			1				1	1	
	a4	1		1	1			1				1	1	
	a5	1		1				1					1	
Intellectual	b1	1			1	1		1			1	1	1	
	b2	1			1	1		1			1		1	
	b3	1			1	1		1			1		1	
	b4	1			1	1		1			1		1	
Applied	c1	1	1	1		1					1	1	1	
	c2	1	1	1		1					1	1	1	
General Tran.	d1				1	1		1						
	d2	1	1					1					1	
	d3				1			1				1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	-	-
Written Exam	Sixteenth week	70
Total		100

6- List of References

6-1 Course Notes

Tantawy, M. (2014) Radar Systems& Remote Sensing. Cairo: MAM Press

6-2 Essential Books

Skolnik, M. (1962).Introduction to Radar Systems. NY: McGraw-Hill.

6-3 Recommended Books

- Sen& Bhattacharya (2003). Radar Systems and Radio Aids to Navigation. Delhi:Khanna Publishers.
- Kingsley &Quegan (2001). Understanding Radar Systems. Delhi: Meenakshi Printers.

6-4 Periodicals, Web Sites, etc.

www.radartutorial.eu / index.en.html

7- Facilities Required for Teaching and Learning:

- Lectures
- Laptop computer with Power Point software.

Course Coordinator:	Ass.Prof .Dr. Magdy O.Tantawy
Head of the Department:	Dr. MokhtarAbd El- Haleem
Date:	September 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC 434: Very Large Scale Integrated Systems(VLSI Systems)

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology. BSc Program
Department offering the program: Electronic Engineering and Communication Technology. Department
Department offering the course: Electronic Engineering and Communication Technology. Department
Date of specifications approval: September, 2015

B - Basic information

Title: Very Large Scale Integrated Systems **Code:** E LC 434 **Year/level:** Senior -1/First semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical: 2**
Pre-requisite: ELC 313

C - Professional information:

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the construction and operation of MOS transistors. They should be able to design, calculate, and estimate the performance of CMOS digital circuits. Also, they should be able to define and use the different CMOS processing technologies.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- the MOS transistor theory (A12).
a2- the basic CMOS digital circuit's construction, including their schematics, stick diagrams, physical layout and performance (A8, A12).
a3- the basic design rules in CMOS technology (A23).
a4- basics of design and implement of CMOS LSI circuits (A14, A15).
a5- basics of performance estimation of original circuits and subsystems (A5, A10, A14).

b - Intellectual skills:

On successful completion of the course, the student should be able to:
b1- apply the various CMOS logic circuit structures (B1).
b2- investigate the basic CMOS digital circuits including their schematics, stick diagrams, and physical layout (B1).
b3- apply the different design rules (B3).
b4- define the potential and limitations of a given technology (B9, B12).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- construct some logic circuits using the CMOS transistors (C1, C15).
c2- use the different CMOS processing technologies (C2).

c3- estimate the performance of a circuit or system (C18).
c4- apply the different CMOS technologies to design and implement CMOS LSI circuits (C1, C3, C12).
c5- use experimental facilities to investigate the system performance (C5, C9, C12).

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- search for information from references and internet (D7).
d2- communicate effectively and present data and results orally and in written form(D3).
d3- use ICT facilities in presentations (D4).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A5, A8, A10, A12, A15, A23
B	Intellectual skills	B1, B3, B9, B12
C	Professional and practical skills	C1, C2, C3, C5, C9, C12, C15, C18
D	General and transferable skills	D3, D4, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
. Introduction and VLSI.	2	2	2
. Introduction to CMOS circuits	-	-	6
. MOS transistors switches	2	2	-
. CMOS Logic	4	2	-
. Circuit and system representations	2	3	8
. MOS transistor theory	-	-	-
. n and pMOS enhancement transistor	4	3	-
. MOS device design equations	3	4	-
. Complementary CMOS inverter-DC characteristics	3	2	-
. CMOS processing technology	-	-	8
. Silicon Semiconductor technology	2	2	-
. Basic CMOS technology	2	2	-
. CMOS process enhancements	2	2	-
. Layout design rules	2	2	-
.Circuit characterization and performance estimation	2	4	6
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Brain storming	Self Learning	Researches and Reports		Midterm	Quizzes	Assignments	Written Exam	Practical Exam			
Knowledge & Understanding	a1	1	1	1	1											1	1	1	1				
	a2	1			1		1							1		1	1	1	1				
	a3	1	1		1		1						1	1			1	1	1	1			
	a4	1		1	1	1	1					1	1	1		1	1	1	1	1			
	a5	1					1					1		1			1	1	1	1			
Intellectual Skills	b1	1	1		1	1	1							1		1	1	1	1				
	b2	1	1	1	1		1					1		1		1	1	1		1			
	b3	1					1					1		1						1			
	b4	1		1			1									1		1	1				
Applied Prof. Skills	c1	1	1	1	1	1	1					1	1			1	1	1	1	1			
	c2	1	1			1										1	1	1					
	c3	1		1			1							1			1			1			
	c4	1	1		1		1							1				1					
	c5	1					1													1			
General Tran. Skills	d1												1	1				1					
	d2	1											1	1				1		1			
	d3		1	1										1				1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes & Reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course Notes:

- Very Large Scale Integrated Systems "Theoritical part".
- Very Large Scale Integrated Systems "Practical part"

6-2 Required Books:

- Neil H. E. Weste and Kamran Eshraghian, "Principles of CMOS VLSI Design, A system Perspective", 2nd Ed, Addison Wesley 1993.
- Neil H.E. Weste and David Harris, "CMOS-VLSI-Design: A Circuit and systemms perspectives", Ed., Pearson Education Inc, 2005.

6-3 Recommended Books

- Jan M. Rabaey,"Digital Integrated Circuits: A Design Perspective", 2nd Ed, Prentice Hall 2003.
- Randall L. Geiger, Phillip E. Allen and noel R. Strader "VLSI Design techniques for Analog & Dig circuit", McGraw-Hill, Inc, 1990..

6-4 Periodicals, Web Sites, etc.

- http://en.wikipedia.org/wiki/CMOS
- http://users.ece.utexas.edu/~adnan/vlsi-05-backup/lec23Concl.ppt (CMOS VLSI Design)
- http://www.youtube.com/watch?v=Y8FvvzcocT4 (VLSI Design)

7- Facilities Required for Teaching and learning

- Lectures room equipped with OHP and data show facility.
- Computer Lab installed by ORCAD and Microwind software.

Course Coordinator: Dr. Samir Kamal
Head of the Department: Prof. Dr. Mokhtar Abd El Haleem
Date: September, 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification
ELC 461: Project 1

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology. BSc Program
Department offering the program:	Electronic Engineering and Communication Technology. BSc Program
Department offering the course:	Electronic Engineering and Communication Technology. BSc Program
Date of specifications approval:	October, 2013

B - Basic information

Title: Project 1 **Code:** ELC 461 **Year/level:** Senior 1, Eighth Semester
Credit Hours: 2 **Lectures:** 1 **Tutorial:**1 **Practical:** 2
Pre-requisite: ELC 313

C - Professional information

1 – Course Learning Objectives:

- The objective of this course is to enable the students to design the basic analog and digital communication systems such as AM, FM, ASK, FSK, PAM and PWM.
- To perform this task the students must also knowing:
  - how to design different types of amplifiers
  - how to design different types of oscillators
  - how to design ADC and DAC is recommended in order to switch between analog and digital communication systems

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Design of amplifier using BJT. **(A4,A14)**
a2- Design of the oscillator circuits. **(A1, A4,A14)**
a3- Design of the AM and FM transceiver . **(A2,A4,A5,A8,A14, A15)**
a4-Design of the ASK and FSK transceiver**(A2,A4,A5,A8,A14, A15)**
a5- Design of the PAM and PWM modulator and demodulator **(A2,A4,A5,A14, A1)**
a6-Design of ADC & DAC **(A1,A4,A5, A15)**
a7- Design of Class A power amplifier **(A1,A4,A5,A14)**

b - Intellectual skills:

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

b1-Discuss the characteristics of amplifier using BJT. **(B2,B5,B19)**
b2- Design and analysis of the oscillator circuits. **(B2, B5,B19)**
b3- Discuss the design of basic analog and digital communication transceivers . **(B2, B3, B5, B6,B19)**
b4- Design and analysis of ADC & DAC circuits **(B5)**
b5- Analysis the characteristic of Class A power amplifier . **(B2, B3, B5)**

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Implement and measure the characteristics amplifiers using BJT**(C15, C20)**

c2- Implement and measure the output frequency of Oscillators **(C12,C15, C20)**

c3- Implement the design of basic analog and digital communication transceivers**(C2, C3, C12, C14,C15, C18, C20)**

c4- Implement ADC & DAC circuits **(C12, C15,C20)**

c5- Implement the design and measure the characteristic of Class A power amplifier . **(C12,C15,C20)**

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- The students implement their engineering knowledge and learned techniques to achieve the proper design. **(D6,D8)**

d2-The students make the general layout of this project. **(D7)**

d3-The students work in groups and communicate effectively under stressful environment and within constraints**.(D1, D2, D3)**

d4- The students should be capable to give a presentation of the project in order to be approved by the leader.**(D1,D5, D7,D8)**

d5-They should effectively manage tasks, time, and resources.**(D6)**

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A8, A14, A15
B	Intellectual skills	B2, B3, B5, B6, B19
C	Professional and practical skills	C2, C3, C12, C14, C15, C18, C20
D	General and transferable skills	D1, D2, D3, D5, D6, D7, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to the project	0.5	0	0
Design amplifier using BJT	0.5	1	2
Design oscillators • Sinusoidal (RC, LC) oscillators • Non Sinusoidal oscillators	2	2	4
Design basic analog and digital transceiver • AM and FM • ASK and FSK • PAM and PWM	2	2	6
Design ADC and DAC	1	1	1
Design class A power amplifier	1	1	1
Total hours	7	7	14

4 - Teaching and Learning Methods

ILO'S	teaching and learning methods													
	Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self-Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	1	1	1	1	1	1	1	1	1		1	1	1	1
Intellectual Skills	1		1			1	1		1			1	1	1
Professional Skills		1	1		1	1	1				1			1
General transferrable Skills	1		1				1	1	1			1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work:		
• Hardware implementation	Bi-Weekly	30
• Seminars, Quizzes & Reports		20
Practical Exam	Fifteenth week	10
Written Exam	Sixteenth week	10
Oral Exam and Presentation	Seventeenth week	20
Technical report	Seventeenth week	10
Total		100

6- List of references:

6-1 Course notes

- project 1 note "*Practical part*"

6-2 Required books

- Ferdinand Haverman Mitchell, Introduction to Electronics Design- 2nded, Prentice Hall;1991

6-3 Recommended books:

- Sedra-Smith, Microelectronics Circuits -6th ed., Oxford University Press, 2009.
- Jacob Millman, Microelectronics-9th ed, McGraw Hill series Jacob Milman, 2012.

6-4 Periodicals, Web sites, etc.

- www.allaboutcircuits.com

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Electronics Lab.
- Computer Lab. Installed with MATLAB andOrcad programs.

Course coordinator:	Dr. Eman Mohammed Mahmoud
Head of the Department:	Dr. Moktarabdelhalim
Date:	20 / 7 / 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC521: Antenna and Wave Propagation

A- Affiliation:

Relevant program: Electronic Engineering & Communication Technology BSc Program.
Department offering the program: Electronic Engineering & Communication Technology BSc Program.
Department offering the course: Electronic Engineering & Communication Technology BSc Program.
Date of specifications approval: October, 2013

B - Basic information:

Title: Antennas and Waves II **Code:** ELC 521 **Level:** Senior 2, Tenth Semester
Credit Hours: 4 **Lectures:** 3 **Tutorial:**1 **Practical:**2
Pre-requisite: ELC423

1 – Course Learning Objectives:
A study of this course will enable the student to understand the basic principle of operation of antennas with different types in addition of measuring different parameters of antenna.

2 - Intended Learning Outcomes (ILOS)
a - Knowledge and understanding:
On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- Concepts and theories of antennas (A1, A21)
a2- Definition and physical concepts of antenna parameters (A1, A21)
a3- Method of solution of antenna equations (A5, A21, A29)
a4- Evaluation of pattern and design parameters for most types of antennas (A5,A21)

b - Intellectual skills:
On successful completion of the course, the student should be able to:
b1- Use vector potential function to solve Maxwell's equation (B1, B2)
b2- Solve the integral equation for different types of antennas. (B1, B2)
b3- evaluate the characteristics and performance of Different antenna types .(B7, B19)

c - Professional and practical skills:
On successful completion of the course, the student should be able to:
c1- Using integral equation to solve Maxwell's equations for the antenna (C1)
c2- Array antenna design for required performance (C2)
c3- Measurement radiation patterns of different types of antennas analyses and report in antenna parameters.(C5, C14,C20)

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1) solutions of problem sets and assignments and revision problems (D6)
d2) Practical measurements in antenna lab (D2)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A2, A5, A21, A29
B	Intellectual skills	B1, B2, B7., B19
C	Professional and practical skills	C1, C2, C5, C14, C20
D	General and transferable skills	D2, D6

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
Introduction to antennas	2	-	-
Basic antenna parameters	6	3	-
Measurement Techniques of antenna parameters	-	-	3
Mathematical tools for antenna analysis and design	6	1	-
Wire antennas: Dipole (infinitesimal, small, finite length, long)	4	2	6
Loop antenna (circular and square)	2	2	6
Special types of wire antennas (Helix and Yagi)	4	2	4
Aperture antennas: Rectangular and circular aperture	4	2	
Microstrip antennas	4	1	4
Horn antennas	2	-	4
Reflector antennas	2		
Array antennas: Two element array and	2	1	1
N-element linear array of uniform amplitude and spacing	2	1	2
N-element linear array of non-uniform amplitude and uniform spacing - Binomial array - Dolph-Tschebyscheff array	2		
Wave propagation in different atmosphere. Wave reflections in ionosphere.	3		
Total hours	45	15	30

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1		1		1			1			1			
	a2	1		1		1		1	1		1		1	1	
	a3	1		1		1		1	1		1	1	1	1	
	a4	1		1		1	1				1	1	1	1	1
Intellectual Skills	b1	1		1	1	1		1	1	1	1	1	1	1	
	b2	1		1	1	1		1	1	1	1	1	1	1	
	b3	1			1	1	1		1	1	1	1	1	1	1
Applied Professional Skills	c1	1		1	1	1		1			1	1	1	1	1
	c2	1			1			1					1	1	1
	c3						1	1		1					1
General Tran. Skills	d1									1	1	1	1	1	1
	d2								1						1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
	Total	100

6- List of references:

6-1 Course notes

1- Antenna and Wave Propagation "Theoretical part"

2- Antenna and Wave Propagation "Practical part"

6-2 Required books

Constantine A. Balanis "Antenna Theory Analysis And Design" John Wiley, New York, 1997.

6-3 Recommended books

Jhon Krauss & R.J Marhefka"Antennas For All Application" McGraw Hill, Boston,2002.

6-4 Periodicals, Web sites, etc.

- http://www.antenna-theory.com/ NPTEL :: Electronics & Communication Engineering - Advanced Antenna Theory
- http://nptel.ac.in/courses/117107035/

7- Facilities required for teaching and learning:

Computer lab installed by MATLAB software.

Course coordinator:	Prof. Dr. Muhammad El-Wakeel
Head of the Department:	Prof. Dr. Mokhtar Abd El- Haleem
Date:	August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC522: Communications -3

A- Affiliation

Relevant program: Electronic Engineering &Communication Technology BSc Program

Department offering the program: Electronic Engineering & Communication Technology Department

Department offering the course: Electronic Engineering & Communication Technology Department.

Date of specifications approval: October, 2013

B - Basic information

Title: Communications -3 **Code:** ELC522 **Level:** Senior 2, Ninth Semester

Credit Hours: 4 **Lectures:** 3 **Tutorial:**1 **Practical:** 2

Pre-requisite: ELC421

C - Professional information

1 – Course Learning Objectives:

A study of this course will enable the student to:

- Good understanding of multiple access techniques.
- Principles of satellite communication.
- Digital hierarchical system and global system mobile.
- Mobile communications.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Satellite link calculation and estimation of path loss. (A26)

a2- The frequency – time and analog – digital combination in mobile. (A27)

a3- CDMA system and spread spectrum modulation techniques. (A27)

a4- Design of TDM – communication for PCM – signals and framing – synchronization. (A18, A27)

.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Design advanced communication systems. (B2 ,B15)

b2- Design a digital hierarchical telephone system. (B2 ,B15)

b3- Evaluate the spectrum efficiency of communication techniques. (B18)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Measure of performance levels of comm. systems. (C19)

c2- Calculate the effect of noise on bit error rate, and apply recent methods to reduce this effect on the communication system (C18)

c3- Study of safety security of communication. (C15)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate effectively through assignments and e- mails. (D3)

d2- Effectively manage tasks, time, and resources. (D6)

d3- Search for information and engage in life-long self-learning discipline. (D7.)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A18, A26, A27
B	Intellectual skills	B2, B15, B18
C	Professional and practical skills	C15, C18, C19
D	General and transferable skills	D3, D6, D7

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1- Introduction to telephone sets.	1	1	1
2- Digital telephone and switching.	3	1	2
3-Hierarchical systems and framing.	3	1	2
4- Satellite orbits and orbital parameters.	1	1	2
5- Basic transmission concepts.	2	2	2
6- Link parameter and effect of noise.	3	1	2
7- Satellite transponder and antenna.	3	1	4
8- Multiple access techniques.	6	1	2
9- Spectral efficiency and measurements.	3	1	2
10- Evaluation of mobile comm.	2	1	2
11- GSM – structure and features.	4	1	2
12- Cellular concepts and advanced.	2	1	1
13- Spread spectrum techniques.	6	1	4
14- Procedures of mobile comm.	6	1	2
Total hours	**45**	**15**	**30**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1			1						1	1	1	1	
	a2	1		1	1							1	1	1	
	a3	1		1		1					1			1	
	a4	1		1							1	1	1	1	
Intellectual Skills	b1	1		1				1	1	1			1		
	b2	1		1		1		1	1	1	1		1	1	
	b3	1			1								1		
Applied Professional Skills	c1						1	1	1	1			1		1
	c2				1		1								1
	c3						1		1	1			1		1
General Tran. Skills	d1						1						1		
	d2						1						1		1
	d3												1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1-Communications -3 "*Theoretical part*"

2- Communications -3 "*Practical part*"

6-2 Required books

- Roger L. Freeman, *Radio System Design for Telecommunication*, 3rd Edition, IEEE – Wiley, 2007.
- Simon Haykin, *Communication Systems*, Fourth edition, John Wily & Sons Inc., 2002.

6-3 Recommended books

Gerard Maral, Michel Bousquet, *Satellite Communication System*, 4th Edition, Newyork, 2002.

6-4 Recommended Web Site

http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-441-information-theory-spring-2010/lecture-notes/

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer Lab. Installed with MATLAB program.

Course coordinator: *Prof. Dr. Saied Bayiumy*

Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*

Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC523: Communications-4

A- Affiliation

Relevant program: Electronic Engineering &Communication Technology BSc. Program.

Department offering the program: Electronic Engineering & Communication Technology Department

Department offering the course: Electronic Engineering & Communication Technology Department.

Date of specifications approval: October, 2013

B - Basic information

Title: Communications-4 **Code:** ELC523 **Year/level:** Senior 2, Tenth Semester

Credit Hours: 4 **Lectures:** 3 **Tutorial:**1 **Practical:** 2

Pre-requisite: ELC522

C - Professional information

1 – Course Learning Objectives:

- To introduce the main stages of digital communication system focusing on coding processes and discrete channel analysis.
- To introduce the main principles of information theory.
- To explain source coding technique and examples of this technique.
- To introduce the importance of channel coding stages showing various types of that technique.
- To analyze discrete channel effect on the transmitted symbols and probability of error calculation.

2 - Intended Learning Outcomes (ILOS)

a- Knowledge and Understanding:

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

a1- Coding stages applied in digital communication system and the goal of each stage. (A18, A19)

a2- Common types of information sources and make some operations on them. (A2)

a3- Understand the concept of source coding and the efficient characteristics that should exist in source codes. (A2, A19)

a4- The objective of channel coding technique and difference among its various kinds. (A19, A27)

a5- The discrete channel memory-less model. (A27)

a6- How to estimate the probability of error using many techniques. (A2)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Perform some operation on zero- memory source and Markov source such as symbol information and source entropy. (B11)

b2- Design suitable source codes for a group of symbols with optimum characteristics. (B2, B3, B11)

b3- Design optimum channel encoder circuit taking in consideration advantages and disadvantages of encoder parameters. (B11, B15)

b4- Take decision about the suitable channel coding technique applied in the digital communication system (Hamming – cyclic – convolutional). (B2, B3, B15)

b5- Simulate a complete digital communication system (base band transmitted data) using software program and study the bit error rate performance of the system. (B2, B15)

b6- Calculate the probability of error for a given discrete channel model using two methods: maximal likelihood and ideal decision. (B11, B15)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Simulate simple digital communication system in the presence of noisy channel, transmitting random bits and find the BER at the receiver. (C13, C14)

c2- Design software program that creates source codes using Huffman method and make some operation on the output codes such as: average code length and source entropy. (C13, C14)

c3- Simulate complete digital communication system with Hamming encoder / decoder stages in the presence of noisy channel and find the BER at the receiver. (C13, C14)

c4- Simulate complete digital communication system with cyclic encoder / decoder stages in the presence of noisy channel and find the BER at the receiver. (C13, C14)

c5- Simulate complete digital communication system with convolutional encoder / decoder stages in the presence of noisy channel and find the BER at the receiver. (C13, C14)

c6- Compare among three channel coding techniques: Hamming – cyclic – convolutional based on BER performance versus SNR variation. (C12, C14)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate effectively through assignments and e- mails. (D3)

d2- Effectively manage tasks, time, and resources. (D6)

d3- Search for information and engage in life-long self-learning discipline. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	**Knowledge and understanding**	A2, A4, A17, A18
B	**Intellectual skills**	B1, B2, B3, B11, B14
C	**Professional and practical skills**	C5, C6, C12, C13
D	**General and transferable skills**	D3, D6, D7

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Measurement of Information – Zero memory information sources – Markov source – source entropy.	12	4	8
2-Source extension.	6	2	4
3- Source compact coding using Huffman method.	8	2	4
4- Discrete information channels – channel capacity and entropy.	7	2	4
5-Channel coding using: Hamming codes, cyclic codes, convolutional codes.	12	5	10
Total hours	**45**	**15**	**30**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1		1							1			1	
	a2	1	1	1	1	1		1			1	1	1	1	
	a3	1	1	1	1	1		1			1		1	1	
	a4	1		1								1	1	1	
	a5	1	1	1	1	1		1	1	1			1	1	
Intellectual Skills	b1	1			1	1		1			1		1		
	b2	1			1	1		1			1	1	1	1	
	b3	1			1	1		1			1		1	1	
	b4	1			1	1		1				1	1	1	
	b5	1			1	1		1				1		1	
	b6	1			1	1		1							
Applied Professional Skills	c1						1	1							1
	c2						1	1							1
	c3						1	1							1
	c4						1	1							1
General Tran. Skills	d1						1								
	d2						1								1
	d3								1	1					
	d4								1	1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1-Communications (III) "*Theoretical part*"

2- Communications (III) "*Practical part*"

6-2 Required books

- Norman Abramson, *Information Theory and Coding*, Mc Graw-Hill, New York, 2002.

6-3 Recommended books

- Peterson, *Error Correcting Codes*, MIT Press, 2001.

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer Lab. Installed with MATLAB program.

Course coordinator: *Dr. Nelly Muhammad Hussein*
Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*
Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC 533:VHDL (Advanced Digital Electronic)

A- Affiliation:

Relevant program: Computer Engineering and Information Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Department offering the program: Computer Engineering and Information Technology Department
Electronic Engineering and Communication Technology Department
Department offering the course: Electronic Engineering and Communication Technology Department
Date of specifications approval: September 2015

B - Basic information:

Title: VHDL **Code:** ELC 533 **Level:** Senior-2, 8th Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** -- **Practical:** 2
Pre-requisite: ELC 313 &CMP 211

C - Professional information:

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the designing and implementation of state machines using Programmable Logic Devices (PLDs), design and implementation of computer hardware systems using Hardware description language (VHDL). Also can design digital systems includes; control systems, graphic and image processing systems, digital signal processing systems, bus interface circuitry, communication systems, peripheral hardware circuitry and industrial application systems.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1-The main strategy for designing the hardware of embedded systems based on VHDL (A1, A12, A13)
a2-The VHDL foundations, considerations and requirements (A4, A8, A14).
a3-The Designing of different digital computer and communication systems based on VHDL(A5, A14, A29).
a4-The basic requirements to meet the software programs with hardware applications (A15, A18, A19).
a5-The evaluation of the final designed digital systems (A15, A16) .

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1-Make strategy for designing the hardware of embedded systems (B1, B4, B12) .
b2- Solve engineering design based on VHDL in mini-project (B17, B18, B19).
b3- Expose the 8051 instruction set, and learn how to use a cross assembler and simulator to develop code(B3, B15, B16).
b4- Select the type of Field Programmable Gate Array (FPGA) to meet the desired application. (B2, B8, B9)
b5-Make the validation and verification for designed application (B2, B3, B13).
b6- Present the features, characteristics for the designed application (B11, B15, B18).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Use the Xilinx's editor and simulator to create and develop VHDL code (C14, C15, C19).

c2-Usethe Mentor graphic simulator to display the input and output digital signal of the designed systems(C3, C14, C20).

c3-Use the Xilinx downloader and FPGA kits to check practically the VHDL code (C1,C3, C20).

c4-Design, realize and check digital systems based on VHDL(C7, C10, C21).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team (D1, D3).

d2- Present data and results orally and in written form (D3).

d3-Research for information in references and internet (D7).

d4- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A8, A13, A15, A16, A19,A29
B	Intellectual skills	B1, B2, B3, B4, B8,B9,B11,B12, B13,B15,B17,B18,B19
C	Professional and practical skills	C1, C3, C7,C10, C14,C15,C19, C20, C21
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topics	Lecture hours	Tutorial hours	Practical hours
➢ System design process	2	--	--
➢ Introduction to VHDL	2		--
➢ Using Xilinx editor and simulator to design different logic components.	4	--	4
➢ Using Xilinx editor and simulator to design finite state machine.	4		2
➢ Using Xilinx editor and simulator to design different digital systems.	4	--	6
➢ Using Mentor graphic simulator to display the input and output digital signals.	2		2
➢ Using Xilinx simulator to check the verification of digital systems.	4		4
➢ Using Xilinx downloader and FPGA Kits to check the validation of digital systems.	4		4
➢ Making a mini-project	4		8
Total hours	**30**	**--**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation	Site Visits		Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1			1					1				1		1	1				
	a2	1					1									1		1	1	1			
	a3	1					1									1		1	1	1			
	a4	1	1	1		1	1					1				1		1	1	1			
	a5	1														1		1	1	1			
Intellectual Skills	b1	1					1									1		1		1			
	b2	1				1	1									1		1	1	1			
	b3	1	1	1			1					1				1			1				
	b4	1	1				1					1				1		1	1	1			
	b5	1					1									1		1		1			
Applied Professional Skills	c1	1					1									1		1		1			
	c2	1				1	1									1		1	1	1			
	c3	1	1	1			1					1				1			1				
	c4	1	1				1					1				1		1	1	1			
General Tran. Skills	d1			1		1						1							1				
	d2		1	1								1	1						1				
	d3	1	1									1							1	1			
	d4	1	1	1								1											

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	By Weekly	20
Mid-Term Exam	6-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

- Jean-Michel Bergé, Alain Fonkoua, Serge Maginot, Jacques Rouillard, "VHDL'92: The New Features of the VHDL Hardware Description Language", Springer, 2012

6-2 Required books

- Stanley Mazor, Patricia Langstraat, "A Guide to VHDL", Springer , 2013
- VolneiA.Pedroni, "Circuit Design with VHDL", MTI Press, Hong Kong, 2004.

6-3 Recommended books:

- Pong P. Chu, "FPGA Prototyping by VHDL Examples", Wiley, 2011.

6-4 Periodicals, Web sites, etc.

http://www.Xilinx.com
http://www.mentor.com

7- Facilities required for teaching and learning:

- White board and Data show.
- Computers and VHDLeditors and simulators.
- FPGA training kits.

Course coordinator:	Dr. Eng. Assem Badr
Head of the Department:	Prof. Dr. Saied Gaweesh
Date:	September 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC524: Radio and Television Engineering Systems

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: October, 2013

B - Basic information

Title: Radio and Television Engineering Systems **Code:** ELC524 **Level:** Senior 2, Ninth Semester
Credit Hours: 4 **Lectures:** 3 **Tutorial:**1 **Practical:** 2
Pre-requisite: ELC315

C - Professional information

1 – Course Learning Objectives:
A study of this course will enable the student to:

- Institution of principles and types of modulation and demodulation.
- Basic of radio transmission and reception.
- Basics of TV color signal transmission and reception.
- Fundamentals of stereo FM transmission and reception.

2 - Intended Learning Outcomes (ILOS)
a - Knowledge and understanding:
On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- Different types of analogue modulators and demodulators. (A18,A24)
a2- Types of radio receivers and super heterodyne RX's fundamentals. (A27,A29)
a3- Color TV. Camera and color signal construction and reception. (A24, A29)
a4- Formation of stereo signal and it's reception by stereo and mono RX's. (A24, A29)

b - Intellectual skills:
On successful completion of the course, the student should be able to.
b1- Design of different types of modulators and demodulators. (B5, B15)
b2- Design principles of radio receivers. (B5, B15)
b3-Carryout signal processing of video and audio signals in both TX & RX. (B5, B15)
b4– Describe the structure of main parts of TV, camera, color matrix, synchronization signal & TV receiver structure and TV-tubes, TVs and how to solve reception and synchronization problems using simple designs (B5, B15)

c - Professional and practical skills:
On successful completion of the course, the student should be able to:
c1- Design and build up of radio circuits. (C19)
c2-Design and estimation of the fundamental parameters of radio. (C15)

c3- Carry out fault detection of TV- RX's, repair and operation test. (C19)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate effectively through assignments and e- mails. (D3)

d2- Effectively manage tasks, time, and resources. (D6)

d3-Search for information and engage in life-long self-learning discipline. (D7.)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A18, A24, A26, A27, A29
B	Intellectual skills	B5, B15
C	Professional and practical skills	C15, C17, C19
D	General and transferable skills	D3, D6, D7

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1. Introduction to needs for modulation.	1	1	2
2. How radio system started and developed.	1	1	2
3. Kinds of radio systems and comparison.	3	1	2
4. Radio system design fundamentals	6	1	2
5. Radio circuits design.	8	1	3
6. Advantages of stereo system VS mono	1	1	2
7. Structure stereo signal and system.	3	1	2
8. The human eye response to colors.	3	1	2
9. Prime colors and color mixing fundamentals	2	1	2
10. Photometric measurements & color matrix.	3	1	2
11.TV camera and construction of color signal.	3	2	2
12. Scanning and synchronization.	3	1	2
13.TV receiver structure and analysis.	4	1	3
14.TV-tubes color picture demonstration.	4	1	2
Total hours	**45**	**15**	**30**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1			1						1	1	1	1	
	a2	1		1	1							1	1	1	
	a3	1		1	1	1					1			1	
	a4	1		1							1	1	1	1	
Intellectual Skills	b1			1				1	1	1			1		
	b2	1		1		1		1	1	1	1		1	1	
	b3	1			1								1		
	b4						1	1	1	1			1		1
Applied Professional Skills	c1				1		1								1
	c2						1		1	1			1		1
	c3						1						1		
General Tran. Skills	d1						1						1		1
	d2												1		
	d3	1			1						1	1	1	1	
	d4						1			1			1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1-Radio and Television Engineering Systems "*Theoretical part*"

2-Radio and Television Engineering Systems "*Practical part*"

6-2 Required books

Simon Haykin, *Communication Systems,* Fourth edition, John Wily & Sons Inc., 2002.

6-3 Recommended books

B.P Lathi, *Advance Digital and Analog Communication Systems*, John Wily & Sons Inc, 2001.

6-4 Recommended Web Site

https://en.wikipedia.org/wiki/Communications_system

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer Lab. Installed with MATLAB program.

Course coordinator: *Prof. Dr. Saied Bayiumy*

Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*

Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC 534: Mobile communication

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology. BSc Program
Department offering the program: Electronic Engineering and Communication Technology. BSc Program
Department offering the course: Electronic Engineering and Communication Technology. BSc Program
Date of specifications approval: October, 2013

B - Basic information

Title: Mobile communication **Code:** ELC 534 **Year/level:** Senior 2, Ninth Semester
Credit Hours: 3 **Lectures:**3 **Tutorial:**3 **Practical:** -
Pre-requisite: ELC 421

C - Professional information

1 – Course Learning Objectives:

A study of this course will enable the student to:

- Be familiar with the technical and economical aspects of mobile communication
- Understand the basic concept of cellular concepts.
- Be familiar with the douplexing methods.
- Understand the basic Multiple Access Techniques.
- Be familiar with the Wireless Digital Transmission Problems
- Understand the basic cellular system Architecture.
- Understand the concept of radio planning.
- Understand the concept of near far problem and power control**.**
- Understand the concept of handover.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1-Participate effectively in communities' activities related to mobile communication (A27, A28)
a2- Understand the essential of the cellular concept. (A27, A28)
a3- Understand the essential of handover in mobile communication. (A27, A28)

b - Intellectual skills:

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

b1- Be familiar with the cellular concept. (B15)
b2- Be familiar with the frequency planning. (B15, B19)
b3- Choose the suitable location BS and MSC. (B15)
b4- Select the suitable frequency for different cells. (B19)

c - Professional and practical skills:

c1- Find optimum cellular distribution for mobile network given specific region parameters. (C1, C13)
c2- Calculate received power at different points of the area covered by mobile network. (C1, C13)
c3- Find estimated QOS factor and BER based on a specific communications system parameters. (C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Use the deep understanding of the course topics in different specializations. (D4, D9)
d2- Incorporate the knowledge of the course topics in an integrated student projects (D4, D9)
d3- Search for information in internet. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A27, A28
B	Intellectual skills	B15, B19
C	Professional and practical skills	C1, C13
D	General and transferable skills	D4, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Overview of Cellular System Mobile Radio Environment	1	1	
Advent of Cellular Systems	1	1	
Cellular Network Organization Cellular System Architecture Cellular Systems Terms Operation of Cellular Systems The Cellular Concept Types of cells Frequency Reuse Radio Planning Propagation model Cell- Splitting Cell Sectorization	1 1 1 1 1 1	1 1 1 1 1 1	
Channel assignment strategies Near-far Problem Power Control Handoff (Handover) Process Performance Metrics Duplex Methods of Radio Links Multiple Access in Cellular Networks Random Access: Another Important Multiple Access Method Types of Interference Standards: Rules for a Cellular Network	1 1 1 1 1 1 1	1 1 1 1 1 1 1	
Total hours	15	15	

4 - Teaching and Learning Methods

ILO's	Teaching and Learning Methods													
	Lecture	Presentations and Movies	Discussions	Tutorials	Lab Experiment	Problem solving	Brain storming	Projects	Site visits	Research and Reporting	Group Working	Discovering	Simulation and Modeling	Role Playing
Knowledge & Understanding	x		x	x		x	x						x	
Intellectual Skills	x		x	x		x	x					x		
Professional Skills	x		x	x		x	x			x	x		x	
General transferrable Skills	x	X	x						x	x				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes & Reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	20
Practical Exam	-	-
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

Lecture notes prepared by course coordinator.

6-2 Main book

Theodore S. Rappaport, ***Wireless communications, principles and practice***, Jhon wiley&Sons, edition 2 1994

6-3 Recommended books:

Non

6-4 Periodicals, Web sites, etc.

Educational CD on mobile communication principles, prepared by Dr.kamel

7- Facilities required for teaching and learning:

- Data show, white board

Course coordinator: Dr. Nelly Muhammad Hussein
Head of the Department: Dr. Moktar abd elhalim
Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC535: Microwave Circuit and Devices

A- Affiliation

Relevant program: Electronic Engineering &Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: October, 2013

B - Basic information

Title: Microwave Circuit and Devices **Code:** ELC535 **Level:** Senior 2, Tenth Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2
Pre-requisite: ELC424

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the basic concepts of microwave circuits and systems and to enable the student to solve different microwave circuits.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Basic equations of microwave resonator filed and quality factors. (A20)
a2- Voltage and current analysis in microwave circuits. (A15)
a3- Impedance and scattering matrix of different microwave circuits. (A15)
a4-Procedure of calculation of microwave power in directional coupler, hybrid junction, isolator, and circulator. (A20)
a5- Field analysis of two-cavity klystron amplifier. (A20)
a6- Effect of reflector voltage changes in reflex-klystron. (A20
a7- Characteristics of different semiconductor microwave circuits (switch-mixer and negative resistance oscillator). (A15)
a8- Block diagram of microwave parametric amplifier and analysis of its gain and bandwidth. (A15)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Deduce circuit models for different cavity resonators. (B16)
b2- Investigate the voltage and current waves in microwave circuits. (B16)
b3- Identify the studied circuits given impedance and scattering parameters. (B16)
b4- Judge the relative power for different circuits and systems. (B17)
b5- Deduce mathematical relations for different passive and active microwave devices. (B17)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Construct, test and investigate the performance of typical microwave circuits. (C15)

c2- Design of different passive microwave circuits (directional coupler – hybrid junction – isolator and circulator). (C17)
c3- Use the Z, Y and S parameters to calculate power and VSWR for different microwave circuits. (C17)
c4- Use the suitable microwave components to measure Z, S parameters for any two port network. (C20)

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1-Search for information from references, journals and internet. (D7, D9)
d2- Write technical reports and presentations. (D7, D9)
d3- Communicate with different web sites. (D7, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A15,A20
B	Intellectual skills	B16,B17
C	Professional and practical skills	C15,C17,C20
D	General and transferable skills	D7, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Impedance, admittance and scattering matrices for two-port, 3-port and 4-port networks.	8	4	4
2- Microwave resonators, design of different types, quality factors.	4	2	2
3- Passive microwave devices (Coupler – Hybrid Junction – Attenuator – Power dividers etc).	4	2	4
4-Ferrite microwave devices (Isolator – Circulator).	4	2	-
5- Microwave amplifier and oscillator (Klystron – Magnetron).	4	2	2
6- Microwave semiconductor devices (PIN diode – Varactor – Negative resistance Diodes).	4	2	3
7- Microwave integrated circuits (Hybrid – Monolithic).	2	1	-
Total hours	**30**	**15**	**15**

4 - Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1			1		1		1		1			1	1
	a2	1			1		1				1			1	1
	a3	1			1						1			1	
	a4	1			1					1		1		1	
	a5	1			1							1		1	
	a6	1			1		1						1	1	1
	a7	1			1								1	1	
	a8	1			1								1	1	
Intellectual Skills	b1	1			1		1				1			1	1
	b2	1			1				1		1			1	
	b3	1			1		1				1			1	1
	b4	1			1					1				1	
	b5	1		1										1	
Applied Professional Skills	c1	1		1										1	
	c2	1		1		1								1	1
	c3	1		1										1	
	c4	1		1		1								1	1
General Tran. Skills	d1		1						1					1	
	d2		1						1					1	
	d3		1						1					1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

1- Microwave Circuit and Devices "*Theoretical part*"

2- Microwave Circuit and Devices "*Practical part*"

6-2 Required books

D.M. Pozar ,*Microwave Engineerin*, John Wiley & Sons , Inc., 2005.

6-3 Recommended books

R.E Collin, *Foundations for Microwave Engineering*, Second edition,Mc Graw Hill , N.Y, 1992.

6-4 Web sites:

www.microwaveresearch.com
www.wavelineinc.com
www.maximintegrated.com

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer lab installed by MATLAB and ORCAD software..

Course coordinator: *Prof. Dr. Mokhtar Abd El- Haleem*
Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*
Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC٥٣٧: Communications Networks

A- Affiliation

Relevant program:	Electronic Engineering &Communication Technology BSc Program.
Department offering the program:	Electronic Engineering & Communication Technology BSc Program.
Department offering the course:	Electronic Engineering & Communication Technology BSc Program.
Date of specifications approval:	October, 2013

B - Basic information

Title: Communications Networks **Code:** ELC٥٣٧ **Level:** Senior 2, Ninth Semester
Credit Hours: ٣ **Lectures:** ٢ **Tutorial:** 3 **Practical:** -
Pre-requisite: ELC421

C - Professional information

1 – Course Learning Objectives:

- Build an understanding of the fundamental concepts of computer networking.
- Establish a solid background of network standards and protocols.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to the concepts of channel capacity, error control, data compression and network security.
- Ensure that students have the necessary networking skills to design, implement, and analyze communication networks.
- Introduce the basic structure and protocols of the Internet.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- The fundamentals of data communication and communication networks.(A2)
a2- Basic network devices, architecture, topologies and interfaces. (A2, A13)
a3- Properties of communication channels, and how to increase its utilization efficiency by applying multiplexing techniques (A18)
a4- Error control mechanisms, the concept of parity and forward error correction (A19)
a5- The basics of data compression, and able to compare its most popular techniques (A2, A19)
a6- How to ensure the security of networked data using state of the art mechanisms (A2, A19).
a7- The state of art network design techniques, and factors that should be taken into consideration to minimize cost and maximize reliability. (A5)
a8- The structure of the Internet, its history, evolution and how packets are routed within this enormous network (A2, A28)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Decide the best network topology and structure that meets certain cost and performance requirements (B2, B9)
b2- Maximize the channel utilization efficiency and satisfy different user requirements by selecting

the appropriate multiplexing technique and allocating appropriate number of slots for users according to their needs. (B9, B15)

b3- Apply the principles of data communication and communication network techniques to design and evaluate new protocols. (B9, B18)

b4- Encode/decode short segments of data and correct erroneous bits (B15)

b5- Analyze a given network and measure its worst case routing delay (B9, B15)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1-Use a network simulation software to solve more than one simulation assignment by self learning (C1, C13)

c2-Apply the design and optimization techniques learnt throughout the course to design and test a highly reliable network that meets customer requirements at minimum cost (C1, C13)

c3-Write several technical reports that describe all aspects of his design, his simulated results and compare it to theoretically predicted results. (C1, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and cooperate with colleagues finish required group assignments within required timeline. (D1, D2, D3)

d2- Search for the solution of the assigned problems in assignments by referring to relevant publications such as text books and research papers. (D7)

d3-Develop self learning capabilities by independently learning how to use a network simulation software and using it to simulate and analyze simple networks as required in assignments. (D4, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A5, A13, A18, A19, A27, A28
B	Intellectual skills	B9, B15, B18
C	Professional and practical skills	C1, C13
D	General and transferable skills	D1, D2, D3, D4, D7, D9

3- Contents:

Topics	Lecture hours	Tutorial hours
Transmission Principles and Media.	2	3
Data Encoding and Channel Capacity.	3	6
Interface Standards.	2	3
Multiplexing Techniques: TDM, FDM, and CDMA.	2	3
Modem Standards And Modulation Techniques.	3	3
Error and Line Control Techniques.	3	3
FEC Techniques.	3	3
Character Oriented and Bit Oriented Protocols.	2	6
Data Compression Techniques.	2	3
Common Carrier Services And Facilities.	2	3
Network Design Techniques.	3	6
The Internet.	3	3
Total hours	**30**	**45**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1			1		-				1	1	1	1	-
	a2	1	1	1	1		-					1	1	1	-
	a3	1	1	1		1	-				1			1	-
	a4	1		1			-				1	1	1	1	-
	a5	1	1	1	1	1	-			1	1		1		-
	a6			1			-								-
	a7		1	1			-	1		1	1	1			-
	a8	1	1	1			-	1		1			1	1	-
	a9			1			-	1							-
Intellectual Skills	b1	1		1			-	1	1	1			1		-
	b2	1	1	1		1	-	1	1	1	1		1	1	-
	b3	1			1		-						1		-
	b4	1		1			-			1			1		-
	b5	1		1	1		-			1	1		1	1	-
Applied Professional Skills	c1	1		1	1	1		1		1		1	1	1	
	c2	1		1	1	1		1		1		1	1	1	
	c3	1		1	1	1		1		1		1	1	1	
General Tran. Skills	d1		1	1			-						1		-
	d2						-						1		-
	d3		1	1			-						1		-

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments and reports	Bi-Weekly	10
Quizzes	4th and 9th week	10
Mid-Term Exam	6th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes

None

6-2 Required books

Behronz A. Foronzan, ***Data communication & Networking***", 3rd Edition, MC Graw Hill, 2003.

6-3 Recommended books

Leon-Garia, ***Communication Network***, 2nd Edition Wijaja, MC Graw Hill, 2000.

6-4 Recommended Web Site

https://en.wikipedia.org/wiki/Telecommunications_network

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator:	*Dr. Nelly Muhammad Hussein*
Head of the Department:	*Prof. Dr. Mokhtar Abd El- Haleem*
Date:	August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC562: Project-2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: October, 2013

B - Basic information

Title: Project-2 **Code:** ELC562 **Level:** Senior 2, Tenth Semester
Credit Hours: 6 **Lectures:** 2 **Tutorial:**1 **Practical:** 8
Pre-requisite: ELC461

C - Professional information

1 – Course Learning Objectives:

- Stating the requirements for developing modern Telecommunication Systems
- Analysis and Project design requirements.
- Projecting possible solutions and anticipated applications.
- Practical design implementation.
- Appreciating project economy.
- Making needed measurements.
- Writing complete report and conclusions.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Planning & choice of project skills (A4, A5, A8, A12, A14)
a2- Using graphical program and system charts in planning (A2, A4, A8)
a3- Organizational & team working skills (A7, A8, A11)
a4- Improvement of personal leadership skills (A9, A11, A14)
a5- Economics with existing market products (A6, A7)
a6- Design of products using market existing and designed components(A14, A15, A16, A17)
a7- Understanding the requirements to produce quality production (A6, A7)
a8- Writing good engineering reports (A10)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Develop imaginative and design abilities (B1, B3, B4)
b2- Conceptualize of ideas (B5, B7, B9)
b3- Convert concepts to real entities (B12, B13)
b4- Integrate the results of design concepts (B14, B15)
b5- Predesigned quality for production and presentation training (B8, B16)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Appreciating elements of Telecommunications design (C1, C2, C3)
c2- Practicing the setup of working Models (C4, C5, C6)
c3- Testing and correcting the projected operation (C7, C8, C9)
c4- Prepare and present technical Reports (C11, C15, C16, C17)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Collaborate within multidisciplinary team and with constrains (D1, D2)
d2- Communicate effectively with IT capabilities (D3, D4)
d3- Effectively manage within a team in time and with resources (D5, D6, D7)
d4- Acquire entrepreneurial skills and refer to proper literature (D8, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A4, A6, A7, A8, A9, A10, A11, A12, A14, A15, A16, A17
B	Intellectual skills	B1, B3, B4, B5, B7, B8, B9, B12, B13, B14, B15, B16
C	Professional and practical skills	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16, C17
D	General and transferable skills	D1, D2, D3, D4, D5, D6, D7, D8, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
Choice of the project subject and its graphic system chart	4	2	20
Design analysis of the part of the project allocated to each student with close cooperation with partners in the team.	5	2	20
Design presentation sessions for each part of the project	5	2	20
Second semester major implementations and practical demonstrations attended by majority of the students	10	5	40
Writing of the final report and the presentation of the project.	6	4	20
Total hours	**30**	**15**	**120**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge &Understanding	a1	x	x	x	x	x	x	x	x	x		x	x		x
	a2	x		x	x	x		x	x				x		x
	a3		x	x	x	x		x	x			x	x		x
	a4	x		x		x			x	x					
	a5	x		x				x	x				x		
	a6		x	x	x		x	x	x	x		x	x		
	a7	x	x	x		x	x	x	x	x			x		x
	a8	x	x	x	x	x	x	x	x	x			x		x
Intellectual Skills	b1	x	x	x	x	x	x	x	x	x		x	x		
	b2		x		x	x	x	x		x			x		
	b3	x		x		x		x		x		x	x		x
	b4		x		x	x	x	x	x	x			x		x
	b5	x		x		x		x		x			x		x
Applied Profession al Skills	cx	x	x	x	x	x		x		x			x		x
	c2					x		x		x			x		
	c3		x	x	x	x		x		x			x		
	c4	x			x			x		x			x		
General Tran. Skills	d1	x	x		x	x	x	x		x			x		
	d2		x	x	x	x	x	x	x	x			x		
	d3		x	x		x		x		x			x		
	d4		x			x		x		x		x	x		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	25
Attendance and group work	Bi-Weekly	25
Practical work and discussions	Bi-Weekly	40
Written report and final Exam	End of second term	60
All Summer Training	summers	50
Total		**200**

6- List of references:

6-1 Course notes

General Basics and Programming

6-2 Required books

As needed for the project subject.

6-3 Recommended books

None

7- Facilities required for teaching and learning:

- Project Laboratories equipped with OHP (overhead projectors) and data show facility as required.
- Personal Computers & labs installed for MATLAB, C++ and special recent software applied to recent processors, as ARDUINO.

Course coordinator: *Prof. Dr. Mustafa Afifi*
Head of the Department: *Prof. Dr. Mokhtar Abd El- Haleem*
Date: August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification

ELC563: Industrial Training -1

A- Affiliation

Relevant program:	Electronic Engineering &Communication Technology BSc Program
Department offering the program:	Electronic Engineering & Communication Technology Department
Department offering the course:	Electronic Engineering & Communication Technology Department.
Date of specifications approval:	October, 2013

B - Basic information

Title: Industrial Training -1 **Code:** ELC563 **Level:** Senior 2, Ninth Semester

Credit Hours: 3 **Lectures:** - **Tutorial:** - **Practical:** 6

Pre-requisite: 108 credits

C - Professional information

1 – Course Learning Objectives:

- Students are allowed to do training with one of the national companies or industrial factories working in the field of their specializations.
- The training plan offered should be approved by a special committee headed by the chairman of the training dept.
- The progress of student in training is evaluated by an accreditation committee.
- All drill is carried out on site.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Industrial engagements in the field of his specialization (A4, A5, A8, A12, A14)

a2- Details of practical application training gained and reporting of his experience (A2, A4, A8)

a3- Gain of on site practical experience in his field of specialization. (A7, A8, A11)

a4- Awareness of the training evaluation report from the accreditation committee to be considered in the follow up course ELC564 (A9, A11, A14)

a5- Digestion of all drill carried out on site (A6, A7)

.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Be practically aware of industry engagements in his field (B1, B3, B4)

b2- Be ready with good plan for his next assignments of the coming course ELC564 (B5, B7, B9)

b3- Awareness of real practical difficulties (B12, B13)

b4- Inherently engaged with thoughts of how to overcome seen practical problems B14, B15)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1-Gain of engineering practical skills(C1, C2, C3)

c2-Ability to understand the profession and be ready for good start after graduation(C4, C5, C6)

c3-Acquaintance with engineering market, helping the ease of having a job upon graduation

(C7, C8, C9)
c4-Increase of the engineering capabilities of the nation with proper training(C11, C15, C16)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Collaborate within multidisciplinary team and with constrains (D1, D2)
d2- Communicate effectively with IT capabilities (D3, D4)
d3- Effectively manage within a team in time and with resources (D5, D6, D7)
d4- Acquire entrepreneurial skills and refer to proper literature (D8, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A4, A6, A7, A8, A9, A10, A11, A12, A14, A15, A16, A17
B	Intellectual skills	B1, B3, B4, B5, B7, B8, B9, B12, B13, B14, B15, B16
C	Professional and practical skills	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16, C17
D	General and transferable skills	D1, D2, D3, D4, D5, D6, D7, D8, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Students are allowed to do training with one of the national companies or industrial factories working in the field of their specializations.	4	4	8
2-The training plan offered should be approved by a special committee headed by the chairman of the training dept.	4	4	4
3- The progress of student in training is evaluated by an accreditation committee.	4	3	4
4- All drill is carried out on site.	4	4	40
Total hours	**16**	**15**	**56**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	x	x	x	x	x	x	x	x	x		x	x		x
	a2	x		x	x	x		x	x				x		x
	a3		x	x	x	x		x	x			x	x		x
	a4	x		x		x			x	x					
	a5	x		x				x	x				x		
Intellectual Skills	b1	x	x	x	x	x	x	x	x	x		x	x		
	b2		x		x	x	x	x		x			x		
	b3	x		x		x		x		x		x	x		x
	b4		x		x	x	x	x	x	x			x		x
Applied Professional Skills	c1	x	x	x	x	x		x		x			x		x
	c2					x		x		x			x		
	c3		x	x	x	x		x		x			x		
	c4	x			x			x		x			x		
General Tran. Skills	d1	x	x		x	x	x	x		x			x		
	d2		x	x	x	x	x	x	x	x			x		
	d3		x	x		x		x		x			x		
	d4		x			x		x		x		x	x		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	20
Practical Exam	tenth week	20
Written Report	tenth week	60
Total		100

6- List of references:

6-1 Course notes

None

6-2 Required books

As needed

6-3 Recommended books

As needed

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer lab equipped with MATLAB and telecommunications software.

Course coordinator:	*Prof. Dr. Mustafa Afifi*
Head of the Department:	*Prof. Dr. Mokhtar Abd El- Haleem*
Date:	August 2015

Modern Academy for Engineering & Technology

Electronic Engineering & Communication Technology Department

Course Specification
ELC564: Industrial Training -2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: October, 2013

B - Basic information

Title: Industrial Training -2 **Code:** ELC563 **Level:** Senior 2, Tenth Semester
Credit Hours: 3 **Lectures:** - **Tutorial:** - **Practical:** 6
Pre-requisite: ELC563

C - Professional information

1 – Course Learning Objectives:

- Students are allowed to do training with one of the national companies or industrial factories working in the field of their specializations.
- The training plan offered should be approved by a special committee headed by the chairman of the training dept.
- The progress of student in training is evaluated by an accreditation committee.
- All drill is carried out on site.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Industrial engagements in the field of his specialization (A4, A5, A8, A12, A14)
a2- Details of practical application training gained and reporting of his experience (A2, A4, A8)
a3- Gain of on site practical experience in his field of specialization. (A7, A8, A11)
a4- Awareness of the training evaluation report from the accreditation committee to be considered in the final report (A9, A11, A14)
a5- Digestion of all drill carried out on site (A6, A7)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Be practically aware of industry engagements in his field (B1, B3, B4)
b2- Be ready with good plan for his next assignments of the coming course ELC564 (B5, B7, B9)
b3- Awareness of real practical difficulties (B12, B13)
b4- Inherently engaged with thoughts of how to overcome seen practical problems (B14, B15)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1-Gain of engineering practical skills(C1, C2, C3)

c2-Ability to understand the profession and be ready for good start after graduation(C4, C5, C6)

c3-Acquaintance with engineering market, helping the ease of having a job upon graduation (C7, C8, C9)

c4-Increase of the engineering capabilities of the nation with proper training(C11, C15, C16)

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Collaborate within multidisciplinary team and with constrains (D1, D2)

d2- Communicate effectively with IT capabilities (D3, D4)

d3- Effectively manage within a team in time and with resources (D5, D6, D7)

d4- Acquire entrepreneurial skills and refer to proper literature (D8, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A4, A6, A7, A8, A9, A10, A11, A12, A14, A15, A16, A17
B	Intellectual skills	B1, B3, B4, B5, B7, B8, B9, B12, B13, B14, B15, B16
C	Professional and practical skills	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16, C17
D	General and transferable skills	D1, D2, D3, D4, D5, D6, D7, D8, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Students are allowed to do training with one of the national companies or industrial factories working in the field of their specializations.	4	4	8
2-The training plan offered should be approved by a special committee headed by the chairman of the training dept.	4	4	4
3- The progress of student in training is evaluated by an accreditation committee.	4	3	4
4- All drill is carried out on site.	4	4	40
Total hours	**16**	**15**	**56**

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self Learning	Researches and Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	x	x	x	x	x	x	x	x	x		x	x		x
	a2	x		x	x	x		x	x				x		x
	a3		x	x	x	x		x	x			x	x		x
	a4	x		x		x			x	x					
	a5	x		x				x	x				x		
Intellectual Skills	b1	x	x	x	x	x	x	x	x	x		x	x		
	b2		x		x	x	x	x		x			x		
	b3	x		x		x		x		x		x	x		x
	b4		x		x	x	x	x	x	x			x		x
Applied Professional Skills	c1	x	x	x	x	x		x		x			x		x
	c2					x		x		x			x		
	c3		x	x	x	x		x		x			x		
	c4	x			x			x		x			x		
General Tran. Skills	d1	x	x		x	x	x	x		x			x		
	d2		x	x	x	x	x	x	x	x			x		
	d3		x	x		x		x		x			x		
	d4		x			x		x		x		x	x		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

None

6-2 Required books

As needed

6-3 Recommended books

As needed

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer lab installed by MATLAB and telecommunications software.

Course coordinator:	*Prof. Dr. Mustafa Afifi*
Head of the Department:	*Prof. Dr. Mokhtar Abd El- Haleem*
Date:	August 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specifications
CMP 110: Program Design and Computer Languages

A- Affiliation

Relevant program: Computer Engineering and Information Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Manufacturing Engineering and Production Technology BSc Program
Architectural Engineering and Building Technology BSc Program

Department offering the program: Mechanical Engineering Department
Electrical Engineering Department
Architectural Engineering Department

Department offering the course: Electrical Engineering Department

Date of specifications approval: September 2015

B - Basic information

Title: Program Design and Computer Languages | **Code:** CMP110 | **Year/level:** Freshman - Fall, Spring and Summer Semesters

Credit Hours: 4 | **Lectures**: 2 | **Tutorial**: 3 | **Practical**: 2

Prerequisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the concepts of programming, the steps of solving problems using flowcharts or using the C++ programming language. They should be able to develop and enhance programming using the Microsoft Visual C++ software (embedded in the Microsoft Visual Studio software package).

2 - Intended Learning Outcomes (ILOS)

a – Knowledge and understanding:

By the end of this course the student should have the following Knowledge:

a1- Steps for solving programs by computer programs and flowcharts (A1, A2, A4, A15).
a2- Program structure in C++ (A4, A15, A18).
a3- Data types, Data declaration (Variables and Constants) in C++ (A16, A18).
a4- Different Categories of Operators and their precedence in C++ (A1, A13).
a5- Control Structures in C++ (Decision and Loop Constructs) (A4, A5).
a6- Arrays, Pointers, References, and dynamic allocation (A16, A18).
a7- Functions and types of calling (by value, by reference) in C++ (A4, A16, A18).
a8- Structures, Unions, Enumeration, User-defined data types and ADT (Abstract Data Types) (A4, A15, A16).
a9- Object-Oriented Programming (OOP) concepts and terminologies (A5, A8, A16, A18).
a10- Input and Output Files (File I/O s), I/O stream, strings and recursion(A5, A16, A18).

b – Intellectual Skills:

On successful completion of the course, the student should be able to.

b1-Investigate on a Visual C++ program in a similar way to other computer programming tools (B1, B13, B14).

b2-Manipulate different data types (B4, B18, B19).

b3- Analyze the problem required to be solved and design the appropriate C++ program to solve this problem (B1, B2, B3, B13)

b4-Manipulate the different control structures; investigate decisions and loops suitable for solving the problem (B2, B7).

b5- Manipulate different C++ structures (Arrays, Structures, Unions and Classes) for different problems (B3, B7, B18).

b6-Investigate the new programming interface and develop to the Object- Oriented Programming concepts (B17, B18).

b7-Manipulate input and output files (for reading from and writing into these files respectively) (B4, B19).

c - Professional and practical skills:

On successful completion of the course, the student should be able to.

c1- Install and use the Visual C++ 2010 (or 2012) software (C6, C14).

c2- Develop and Produce a solution to the problem through flowcharts and C++ programs (C1, C4).

c3-Solve different engineering problems related to the artificial intelligent systems, microcontroller systems, operating systems and their basic elements (C1, C5, C6, C15).

c4- Design and implement C++different structures (C2, C3, C4, C13).

c5- Apply the concepts of Object – Oriented Programming for solving different engineering problems (C2,C3,C4,C5).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion and seminars (D1, D2, D3).

d2- Communicate effectively and present data and results orally and in written form (D3, D4).

d3- Use ICT facilities in presentations, and manage resources efficiently (D4, D5).

d4- Search for information's in references, journals and in internet (D7).

d5- Practice self-learning (D7, D9).

Co Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A5, A8, A13, A15, A16, A18
B	Intellectual skills	B1, B2, B3, B4, B7, B13, B14,B17,B18, B19
C	Professional and practical skills	C1, C2,C3,C4,C5, C6, C13, C14,C15
D	General and transferable skills	D1, D2, D3, D4, D5,D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Steps for solving programs by computer programs	2	3	2
➢ Program documentation and flow charts	2	3	2
➢ Program structure in C++	1	2	1
➢ Data types and declaration in C++	2	2	2
➢ Input/output in C++ and I/O stream class	1	2	1
➢ I/O manipulation	1	2	1
➢ Operators and precedence in C++	2	3	2
➢ Decision (Selection) Constructs in C++	2	3	2
➢ Loops (Iterations) in C++	2	3	2
➢ Arrays, Pointers, References, and dynamic allocation	2	3	2
➢ Functions in C++, calling functions (by value, by reference)	2	3	2
➢ Structures, Unions, Enumeration, and user-defined data types	2	3	2
➢ Abstract data types (ADT)	1	2	1
➢ Concepts and Terminologies of Object-Oriented Programming (OOP)	2	2	2
➢ Classes and objects	2	2	2
➢ Constructors, destructors, friend functions	1	2	1
➢ Polymorphism, encapsulation, inheritance	1	2	1
➢ File I/O, I/O stream, strings, recursion	2	3	2
Total hours	**30**	**45**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge &Understanding	a1	1	1	1		1						1				1		1	1	1			
	a2	1	1		1											1		1	1	1			
	a3	1	1		1		1					1				1		1	1	1			
	a4	1	1		1		1					1				1	1	1	1	1			
	a5	1	1		1		1					1	1			1	1	1	1	1			

	a6	1	1	1	1		1					1				1	1	1	1	1			
	a7	1	1	1	1		1					1	1			1	1	1	1	1			
	a8	1	1		1		1					1				1	1	1	1	1			
	a9	1	1	1	1		1					1	1			1	1	1	1	1			
	a10	1	1		1		1					1				1	1	1	1	1			
Intellectual Skills	b1		1	1			1						1				1	1	1	1			
	b2	1	1		1		1									1		1	1	1			
	b3	1	1	1	1	1						1				1		1	1	1			
	b4	1	1		1	1	1					1				1	1	1	1	1			
	b5	1	1	1	1		1					1	1			1	1	1	1	1			
	b6	1	1	1	1		1					1	1			1	1	1	1	1			
	b7	1	1		1		1					1				1		1	1	1			
Applied Professional Skills	c1						1										1						
	c2						1										1						
	c3						1										1						
	c4						1										1						
	c5						1										1						
General and Transferable Skills	d1																	1		1			
	d2																	1		1			
	d3																	1		1			
	d4																	1		1			
	d5																	1		1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes, assignments and reports	Bi-Weekly	10
Mid-Term Exam	6th Week	10
Practical Exam	14th, 15th weeks	20
Written Exam	Sixteenth week	60
Total		**100**

6- List of references:

6-1 Course notes:

- Lecture notes and handouts

6-2 Required books:

- Walter Savitch, Problem Solving With C++, Pearson Education Inc., 2006.
- Deitel & Deitel, C++ How To program, Prentice Hall, 2001.
- Al Stevens, C++ Programming Bible, IDG, 2000.

6-3 Recommended books:

- C++ Essentials, Sharam Hekmat, PragSoft Corporation,www.pragsoft.com, 2005

6-4 Periodicals, Web sites, etc.:

- http://www.cplusplus.com

7- Facilities required for teaching and learning:

- Computer Lab.
- Computer, Data show
- Computer package (Microsoft Visual Studio 2010 or 2012).

Course coordinator:	Dr. Ehab ElShimy
Head of the Department:	Prof. Dr. Said Gawish
Date:	September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 210: Data Structures and Algorithms

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electrical Engineering Department

Department offering the course: Electrical Engineering Department

Date of specifications approval: September 2015

B - Basic information

Title: Data Structures and Algorithms **Code:** CMP 210 **Level:** Sophomore, Second Semester

Credit Hours: 3 **Lectures**: 2 **Tutorial/Exercise**: 2 **Practical:** -

Pre-requisite: CMP 110

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the different data structures, their storage in computer memory and their implementation. They should be able to excute different algorithms like delectation of data searching and sorting.

2 – Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Storage of data in counter memory like numbers in the fixed and floating point, one and two-dimemsional arrays, matrices, records, and spare matrices (A1, A3,A18).

a2- Push and pop operations associated with a stack and memory addressing (A1, A3, A5, A9,A18).

a3- Insertion and deletion from a circular queue (A3, A9,A18).

a4- Representation of header, header-free, and two-way linked lists in memory (A2, A4, A9,A18).

a5- Traversing, searching, insertion, and deletion algorithms for linked lists (A3, A5, A12,A18).

a6- Linked, T.B.S and string array representation of binary tree in computer memory (A2, A4, A9,A18).

a7- Traversal algorithms, using preorder, in order and post order traversals (A3, A5, A12,A18).

a8- Path length and Huffman's algorithm (A2, A3, A16,A18).

a9- Direct and binary searching algorithms, and associated binary search tree (B.S.T) with searching, deletion, and insertion into B.S.T (A2, A3, A5, A12).

a10- Sorting algorithms using selection, exchange, insertion, and deducing the algorithms complexity (A2, A4, A5,A18).

a11- Bubble, quick, and heap sort algorithms (A2, A4, A9,A18).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Judge the types of data if it is adjacent continuous blocks like arrays, matrices, and other data which can have separator addresses such that the probability of memory overflow approaches zero (B1, B4, B8).

b2- Deduce the proper data structures algorithms for problems arising in the engineering fields (B2, B4, B12, B14).

b3- Optimize data manipulation to minimize the program running time implementing the Huffman's algorithm (B1, B2, B4, B14).

b4- Construct a special data base for storage of data on the basis of the B.S.T insertion, and deletion algorithms (B8, B12, B17, B18).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Use the data structure as program tools (C12).

c2- Join the allocated topics with topics of the compiler subject to achieve an optimum compiler design (C12).

c3- Use the given topics to measure program efficiency (C12).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate effectively through reports and e-mails (D3, D6, D7).

d2- Demonstrate efficient IT capabilities (D4, D6).

d3- Search for information and engage in life-long self-learning discipline (D1, D2, D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4, A5, A9, A12, A16,A18
B	Intellectual skills	B1, B2, B4, B8, B12, B14, B17, B18
C	Professional and practical skills	C12
D	General and transferable skills	D1, D2, D3, D4, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Introduction	2	3	-
• Basic Definitions and basic operation.			
• Data representation and storage, fixed point and floating point formats.			
• Applications of data structure.			
➢ Arrays	3	2	-
• Storage of one dimensional arrays in memory.			
• Storage of two-dimensional arrays using row major and column major ordering.			
• Pointer arrays.			

• Parallel array storage of records.			
• Operations on matrices and associated algorithms.			
• Storage of sparse matrices.			
➢ Linear lists			
• Definitions and properties.			
• Stacks, definition, push, pop operation.	3	2	-
• Queues, definition, insertion, and deletion from circular queues.			
• De-queues, definition, and basic operations.			
➢ Linked lists			
• Basic structures of header-free and header linked lists.			
• Representation in memory.			
• Travering and searching linked lists for sorted and unsorted linked lists.	4	4	-
• Insertion and definition algorithms.			
• Two-way lists.			
➢ Trees			
• Basic definitions and structure.			
• Representation of binary trees in memory.			
• Linked representation.			
• String array representation.			
• Terminating binary sequence (TBS) representation.	7	8	-
• Transformation of a general tree into binary tree.			
• Transferring tree and transversal algorithms using stacks (Preorder, in			
• Threads and in order threading.			
• Path length and Huffman's tree achieving using Huffman's algorithms.			
➢ Searching			
• Introduction and searching types.			
• Scanning.			
• Direct scanning and controlled scanning.			
• Binary search algorithms.	6	7	-
• Binary search trees.			
• Definition.			
• Searching and insertion into B.S.T.			
• Deletion from a B.S.T.			
• Building a B.S.T			
➢ Sorting			
• Introduction.			
• Sorting algorithms using selection, exchange, insertion techniques.			
• Complexity of algorithms.	5	4	-
• Bubble sort algorithms as an example for exchange technique.			
• Binary sort (quick sort) algorithm.			
• Heap sort algorithms.			
Total hours	30	30	-

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1			1					1		1		1
	a2	1			1					1		1		1
	a3	1			1					1		1		1
	a4	1		1				1		1				
	a5	1	1		1					1		1		1
	a6	1			1			1		1				
	a7	1	1	1						1		1		1
	a8	1		1	1					1				1
	a9	1			1			1		1		1		1
	a10	1	1		1					1				
	a11	1		1				1		1				1
Intellectual Skills	b1	1			1	1		1		1				
	b2		1			1		1		1				1
	b3		1	1		1		1				1		1
	b4		1	1				1				1		
Applied Professional Skills	c1			1						1				1
	c2		1	1		1		1						
	c3		1	1		1		1						1
General Tran. Skills	d1			1		1		1				1		
	d2			1		1		1						1
	d3			1		1						1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	-
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Data structures theory & Algorithms, Modern Academy Press, 2002.

6-2 Required books

- Mohi Eldin Rateb, Data structures theory & Algorithms, Modern Academy Press, 2002.
- Micheal Main and Water Savitch, Data Structure and other Objects, Benjamine/Cummings, CA, 1995.
- Nell, Susan Lily, Data Structure using Pascal, Prentice Hall, Inc., 1981.
- Adam Drozdek, Data Structure and Algorithms in C++, Cengage Learning , 4th edition, 2012.

6-3 Recommended books:

- Ellis Horowitz, Sartaj Sohni, Fundamnetals of Data Structires, Computer Science Press, Inc., 1982.
- Glenn W. Rowe, Introduction to Data Structures and Algorithms with C++, Prentice Hall, 1991.

6-4 Periodicals, Web sites, etc.

http://www.prenhall.com/mano

7. Facilities required for teaching and learning:

None.

Course coordinator:	Prof. Dr. Mohi-Eldin Rateb
Head of the Department:	Prof. Dr. Said Gawish
Date:	September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 211: Logic Design-1

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology Department.

Date of specifications approval: October, 2012.

B - Basic information

Title: Logic Design-1 **Code:** CMP 211 **Level:** sophomore, Third Semester

Credit Hours: 4 **Lectures:** 3 **Tutorial/Exercise:** 1 **Practical:** 2

Pre-requisite: MTH 101

C - Professional information

1 – Course Learning Objectives:

The basic objective of this course is to give the students the main concepts of digital circuit construction and the different approaches to achieve the highest speed and the lowest cost of these circuits.

2 – Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- The laws of Boolean algebra to simplify a complicated logic expression (A1, A2).
a2- Construction of the truth table for a special given problem (A2, A5).
a3- Expressing a logic function in the S.O.P and P.O.S algebraic forms and karnaugh map representation (A2, A5).
a4- Minimization of logic functions using K.M and Quine – Mc – Clusky's tabular method and realization using NAND and NOR gates only (A2, A3).
a5- Combinational modules used in digital systems like adders, de-multiplexers, multiplexers, decoder, encoder, parity checker and comparator circuits (A2, A3).
a6- Representation of simple sequential circuits using state diagram and state table (A2, A5).
a7- Sequential circuit elementary Flip-Flop circuits (A2, A5).
a8- Overcoming racing in synchronous sequential circuits using M.S or edge-triggered Flip-Flops (A2, A3).
a9- Sequential logic modules like registers, shift registers, and counters (A2, A3, and A14).
a10- Memory modules like combinational ROM and RAM sequential modules (A2, A3, and A14).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Deduce a logic function for solving a given simple problem (B1, B2).

b2- Achieve a logic model which introduces a solution of a high-scale problem using combinational modules (B2, B3, and B4).
b3- Analyze the realization approaches using gate and modular designs and determine the measures for selection of any of them (B2, B3, and B4).
b4- Investigate the benefits of using a special Flip-Flop type for realizing a sequential circuit or using the asynchronous or the synchronous approach (B4, B8, and B12).
b5- Suggest a solution for an allocated sequential problem and report the merits of this solution (either higher speed of lower cost) (B4, B8, and B14).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Construct of a logic circuit using available logic gates satisfying minimum cost (C1, C2, and C3).
c2- Use the practical lab. Knowledge to construct the layout for a solution using modular design (C2, C3, and C6).
c3- Investigate the output performance for input sequence (C1, C2).
c4- Design a binary counter counting in an arbitrary input random sequence using any type of Flip-Flops (C3, C5).
c5- Design the associated circuits for fault detection in counter operation and presetting to a given initial state (C1, C3, and C5).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Use internet, references and journals for searching information (D3, D7, and D9).
d2- Write a technical report for a given task and prepare its presentation (D3, D4, D6, and D7).
d3- Join teams (D1, D2, and D5).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A5, A14
B	Intellectual skills	B1, B2, B3, B4, B8, B12, B14
C	Professional and practical skills	C1, C2, C3, C5, C6
D	General and transferable skills	D3, D4, D5, D6, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Introduction	3	1	-
• Basic Definitions.			
• Laws of Boolean algebra.			
➢ Logic Functions Representation & Realization	2	1	3
• Methods of representation of logic functions truth table, S.O.P and P.O.S).			
• Realization of logic functions using AND-OR_NOT, NAND only and NOR only gate systems.	1	1	
• Matching logic functions with gate systems.			
➢ Logic function minimization	2	1	-

• Using basic laws of Boolean.	1		
• Using karnaugh map minization.	1	2	-
• Using Quine-Mc Clusky's Methods.	1		
• Minimization of multiple-output Logic Functions.	1	1	-
➢ Combinational logic modules	2	1	2
• Half and full adders, Parallel adder connection, look ahead carry.			
➢ Decoders and de-multiplexers	1		2
➢ Encoders	1		
➢ Data selectors (multiplexers)	1		
• Parity checkers.	1	1	2
• Read only memories.	2		2
• Binary comparators.	2		2
➢ Sequential logic circuit elements	2		-
• State diagram and state table representation of sequential circuits.			
➢ Asynchronous and synchronous sequential elements	2	1	3
• S-R Flip-Flop, and J-K Flip Flop.			
• D Flip-Flop, and T Flip Flop.	2	1	3
• Racing in sequential circuits.	1		-
• Master-slave and Edge-triggered Flip-Flops.	2		2
➢ Sequential logic circuit modules	1		-
• Introduction.			
➢ Registers and shift registers	3	1	2
➢ Asynchronous and synchronous counters	4	2	3
➢ Counter using shift-registers (Johnson and ring counters)	3		1
➢ Random access memories (basic cell, addressing and read-write operations)	3	1	3
Total hours	**45**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1			1					1				1
	a2	1			1	1				1		1		1
	a3	1			1	1	1			1		1		1
	a4	1			1	1		1		1				1
	a5	1	1				1			1	1	1		
	a6	1		1	1			1		1				1
	a7	1			1		1			1	1	1		
	a8	1		1				1		1				1
	a9	1	1		1		1			1	1	1		1
	a10	1		1			1			1	1	1		1
Intellectual Skills	b1	1			1	1				1		1		1
	b2	1		1		1		1		1				1
	b3	1		1				1		1				1
	b4	1		1				1		1		1		1
	b5			1		1		1		1				1
Applied Professional Skills	c1	1			1	1		1		1		1		
	c2	1		1	1		1			1	1			1
	c3	1		1	1					1				
	c4	1			1	1	1	1		1	1	1		1
	c5	1		1		1	1			1	1			
General Tran. Skills	d1	1	1									1		1
	d2		1	1		1		1				1		1
	d3			1		1		1						

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10%
Mid-Term Exam	6-th Week	10%
Practical Exam	Fifteenth week	20%
Written Exam	Sixteenth week	60%
Total		100%

6- List of references:

6-1 Course notes:

Digital logic circuit (Theoretical + Practical).

6-2 Required books:

- Mohi Eldin Rateb, ***Digital Logic Circiuts***, Modern Academy Press, 2002.
- Mano, M.M, and Kime, C.R, ***Logic and Computer Design Fundamental***, 2nd ed., Englewood cliffs, NJ: Prentice Hall, 2000.
- Nelson, V.P, Nagel, H.T., Carroll, B.D., and Irwin, J.D., ***Digital Logic Circuit Analysis and Design***, NJ: Prentice Hall, 1995.

6-3 Recommended books:

- Warkely, J.F, ***Digital Design: Principles and Practices***, 2nd ed. Englewood cliffs, NJ: Prentice Hall, 2000.
- Mano, M.M, ***Digital Design*** 2nd ed. Englewood cliffs, NJ: Prentice Hall, 1991.

6-4 Periodicals, Web sites, etc.

www.prenhall.com/mano

7- Facilities required for teaching and learning:

None.

Course coordinator:	Prof. Dr. MOHI-ELDIN RATEB
Head of the Department:	Prof. Dr. MOKHTAR ABDELHALEM
Date:	August 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 310: Engineering Computer Applications

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology BSc Program

Date of specifications approval: September 2015

B - Basic information

Title: Engineering Computer Applications | Code: CMP 310 | Year/level: Junior , First Semester
Credit Hours: 3 | Lectures: 2 | Tutorial:1 | Practical: 2
Pre-requisite: CMP 110

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the features, basic concepts and different operations of MATLAB. They should be able to develop and enhance modules and programs using MATLAB software package.

2 - Intended Learning Outcomes (ILOS)

a – Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- MATLAB fundamentals(A1,A2).
a2- Mathematical, logical, Array Operations, Vectors and Matrix Operations in MATLAB (A1,A8).
a3- MATLAB plotting and Graphing capabilities(A5,A16).
a4- MATLAB programming features (using script M-files and function files) (A2,A5,A12).
a5- MATLAB applications in the field of circuit theory (DC analysis, transient analysis, and AC Analysis and network functions of an electrical circuit) (A12,A13)
a6- MATLAB applications in the field of semiconductor physics and Operational Amplifier (A12,A13)
a7- Basics of MATLAB SIMULINK (A8).

b – Intellectual Skills:

On successful completion of the course, the student should be able to:

b1-Investigate on a MATLAB program in similar way to other computer programming (B1,B2,B3).
b2- Utilize different graphics in two and three dimensions (B5,B7,B14).
b3- analyze DC and AC circuits, and design the appropriate MATLAB program to solve (B13).

b4- Investigate a physical problem, deduce its mathematical model, then perform the MATLAB program to solve (B13,B14).

b5-Manipulate SIMULINK model for different problems (B17,B18).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Use of different matrix and array operations for both real and complex numbers(C1,C2)

c2- Produce graphics in two and three dimension (C5,C14)

c3- Develop MATLAB programs to simulate different systems (C6,C7,C14).

c4-Solve different operational problems related to the electrical, electronic, and control systems and their basic elements (C1, C5, C6, C7, C15).

c5- Design and implement SIMULINK model for different problems (C3,C4,C5).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion and seminars(D1, D3).

d2- Communicate effectively and present data and results orally and in written form(D3,D4).

d3- Use ICT facilities in presentations, and manage resources efficiently (D4,D5).

d4- Search for information's in references, journals and in internet(D7).

d5- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5, A12, A13, A16
B	Intellectual skills	B1, B2, B3, B5, B7, B13, B14,B17,B18
C	Professional and practical skills	C1, C2,C3,C4,C5, C6, C7,C14,C15
D	General and transferable skills	D1, D3, D4, D5,D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ . Introduction to MATLAB	2		
➢ Matlab Fundamentals	2	1	2
➢ Matrix Operations, Array Operations Vectors and Matrix Operations, Graphing	2	2	2
➢ Data Analysis	2	2	2
➢ Plotting Commands	2	2	2
➢ Control Flow. -M – Files	2	2	2
➢ Control Statements	2		2
➢ DC Analysis	2	1	2
➢ Transient Analysis	2	1	2
➢ AC Analysis and network functions	2	1	2
➢ Advanced Programming in MATLAB in Semiconductor physics . -Operational Amplifier	3		4

➢ Computer Application using MATLAB-Mathematical Models of systems	3	1	4
➢ Introduction to Simulink	3	2	3
➢ Seminar	1		1
Total hours	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation	Site visits	discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1			1					1				1		1		1			
	a2	1					1							1		1		1	1	1			
	a3	1					1							1		1		1		1			
	a4	1	1	1	1	1	1					1				1		1	1	1			
	a5	1			1		1									1	1	1		1			
	a6	1			1		1					1		1		1			1	1			
	a7	1	1	1	1	1	1					1	1	1		1	1		1	1			
Intellectual Skills	b1	1			1											1		1		1			
	b2	1	1													1		1		1			
	b3	1		1	1		1					1		1		1	1			1			
	b4	1			1		1					1		1		1	1	1		1			
	b5	1	1		1	1	1							1		1	1	1		1			
Applied Professional Skills	c1	1			1	1	1							1		1		1					
	c2	1	1													1		1					
	c3	1		1		1						1	1										
	c4	1	1		1	1								1									
	c5	1	1		1		1							1									
General Tran. Skills	d1			1		1						1											
	d2		1	1								1	1										
	d3	1	1									1											
	d4	1	1	1								1											
	d5			1								1	1										

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes:

Lecture notes and handouts

6-2 Required books

- D. Hanselman and B. Littlefield, Mastering MATLAB7, Prentice Hall, 2005
- David C. Kuncicky ,"Matlab Programming ",Pearson Prentice Hall ,2004.
- Amos Giltat," Matlab An Introduction with Applications", John Wiley.2004

6-3 Recommended books:

- Thomas K., Jewelly, Computer Applications for Engineers, Prentice Hall, 1990.
- Jaan Kiusalaas, Numerical Methods in Engineering with MATLAB, Cambridge University Press, 2010.

6-4 Periodicals, Web sites, etc.:

http://www.mathwork.com/
http://www.GenLib.org/ .
http://www.talkthecold.com/bizgoogle/ .
http://www.SCI-hub.org/ .
http://www.scrius.com/ .
http://www.Merlot.org/ .
http://www.Vlab.co.in/ .
http://www.W3schools.com/

7- Facilities required for teaching and learning:

- Computer Lab.
- Data show
- Computer software package.

Course coordinator: Dr. AbdElmoneim Fouda
Head of the Department: Prof. Dr. Said Gawisha
Date: September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 311: Numerical Methods with Computer Applications

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program. Computer Engineering and Information Technology BSc Program.
Department offering the program:	Electronic Engineering and Communication Technology Department. Computer Engineering and Information Technology Department.
Department offering the course:	Basic Sciences Dept.
Date of specifications approval:	September 2015

B - Basic information

Title: Numerical Methods with Computer Applications **Code:** CMP 311 **Level:** Junior, Sixth Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**2 **Practical:**- **Total:**3

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of some numerical methods for solving many mathematical and engineering problems. They should be able to develop and enhance modules and programs to implement such numerical methods and problems.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Methods of Least square curve fitting (A1, A5)

a2- Methods of numerical interpolation using Newton and Lagrange methods (A1,A5)

a3- Methods of numerical Integration (A1)

a4- Methods of numerical solution of initial value problems (A1)

a5- Methods of numerical solution of linear and non-linear equation (A1)

a6-Computer applications of numerical methods for pattern recognitions, image processing and artificial neural networks(A8,A16,A17)

b - Intellectual skills:

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

b1- Make a logical Analysis to reach to the proper solution for pattern recognition applications (B1, B2, B3)

b2- Choose the appropriate mathematical tools and computing methods for modelling and analysis of images processing activities (B2, B8, B13)

b3- Recognize the right method which has minimum error and using minimum numerical steps (B2, B3)

b4-select the suitable numerical method for modelling and analyzing different computer applications (B1)

c - Professional and practical skills:

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

c1- Identify appropriate economic models (C1, C13).

c2- Use appropriate IT packages effectively (C1, C13).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion and seminars(D1, D3).

d2- Communicate effectively and present data and results orally and in written form(D3,D4).

d3- Use ICT facilities in presentations, and manage resources efficiently (D4,D5).

d4- Search for information's in references, journals and in internet(D7).

d5- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A5 A8,A16,A17
B	Intellectual skills	B1, B2, B3, B8, B13
C	Professional and practical skills	C1, C13
D	General and transferable skills	D1, D3, D4, D5,D7,D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Curve fitting and linear Approximation of a function.	2	4	
Polynomial interpolation and error estimation in the interpolation formula Lagrange interpolation	2	2	
Computer application of error estimation in pattern recognition	2		
Newton –interpolation	1	2	
Hermite interpolation.	1	2	
Newton-Cotes formula, composite Newton-cotes formula	2	2	
Romberg – steifel integration method.	2	2	
Numerical solution of initial value problems	2	2	
Numerical solution of first order methods Runge- Kutta methods	2	4	
Numerical solution of linear and non-linear equation, Gauss-Seidel method, fixed point iteration method, and Newton-Raphson method.	2	2	
Intensity transformation, and spatial filtering image processing computer	4	3	

application			
Computer applications of numerical methods for object recognitions	4	3	
Computer application of some numerical methods in the field of artificial neural networks ANN	4	2	
Total hours	**30**	**30**	

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods				Assessment Method			
		Lecture	Discussions and seminars	Tutorials	Problem solving			Researches and Reports	Modeling and Simulation	Site visit	Discovering	Written Exam	Quizzes	Assignments	
Knowledge & Understanding	a1	1	1	1	1			1				1	1	1	
	a2	1	1	1	1			1				1	1	1	
	a3	1		1	1			1				1	1	1	
	a4	1		1	1			1				1	1	1	
	a5	1		1	1			1				1	1	1	
	a6	1	1	1	1							1			
Intellectual Skills	b1	1	1	1	1							1	1	1	
	b2	1		1	1			1				1	1	1	
	b3	1	1	1				1			1	1	1	1	
	b4	1			1				1			1	1		
Applied Professional Skills	c1	1		1	1						1	1	1	1	
	c2	1		1	1					1	1	1	1	1	
General Tran. Skills	d1			1	1			1						1	
	d2		1	1	1			1						1	
	d3		1											1	
	d4		1											1	
	d5		1		1			1						1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: quizzes assignments	Bi-Weekly	10
Mid-Term Exam	8-th Week	20
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

Numerical Methods for Engineers By Dr. Osama El-Gayar

6-2 Required books:

- R. L.Brude, Numerical Analysis,4Ed., Mc Graw Hill, 1995.
- A. W. Al-khafaji and J. R.Tooley, Numerical methods in Engineering Practice, New York, 1990.
- Jaan Kiusalaas, Numerical Methods in Engineering with MATLAB, Cambridge University Press, 2010.
- Amos Giltat," Matlab An Introduction with Applications", John Wiley.2004

6-3 Recommended books:

- Thomas K., Jewelly, Computer Applications for Engineers, Prentice Hall, 1990.
- Rafeal C. Gonzales, Richrad E. Wood, Steven L. Eddins. Digital image processing using Matlab, Pareson Prentice Hall, USA,2004.

6-4 Periodicals, Web sites, etc.:

- http://math.fullerton.edu/mathews/numerical.html
- http://www.mathwork.com/ .
- http://www.GenLib.org/ .
- http://www.talkthecold.com/bizgoogle/ .
- http://www.SCI-hub.org/ .
- http://www.scrius.com/ .
- http://www.Merlot.org/ .
- http://www.Vlab.co.in/ .
- http://www.W3schools.com/

7- Facilities required for teaching and learning:

- Data show
- White board
- Computer software package

Course coordinator: Dr. AbdElmoneim Fouda
Head of the Department: Dr. Lila Soliman
Date: September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 410: Microprocessor Based-Systems

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology

Date of specifications approval: September 2015

B - Basic information

Title: Microprocessor Based-Systems **Code**: CMP 410 **Level**: Senior-1, 7th Semester

Credit Hours: 3 **Lectures**: 2 **Tutorial/Exercise**:1 **Practical**: 2

Pre-requisite: CMP 211

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should demonstrate the knowledge and understanding the architecture of microprocessor and microcontroller. In addition to recognize their addressing modes, binary decoding, assembly language programming. Besides understanding the basic concepts of interfacing between the processors and their memories, input/output units. They should be able to design digital systems based on the microprocessor and microcontroller.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- The architecture of microprocessor and microcontroller (A9, A15, A18).
a2- The assembly instructions for the Intel microprocessor and microcontroller (A5, A14).
a3- The memory architecture for the microprocessor and microcontroller (A4, A14).
a4- Physical, logical and effective addresses for Intel microprocessor (A5, A9, A16).
a5- Instruction pipeline technique for the microprocessor (A4, A14, A16).
a6- The addressing modes for the microprocessor and microcontroller (A4, A14).
a7- The Instruction formats for microprocessor and microcontroller (A4, A14).
a8- The Memory interfacing with microprocessor and microcontroller (A4, A9, A14).
a9- The interfacing of different digital components with the microprocessor and microcontroller (A4, A14).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Recognize between the architecture of microprocessors and microcontrollers (B2, B4, B9).
b2- Write assembly programs for the Intel microprocessor and microcontroller (B3, B13, B17).
b3- Analyze the characteristics of the Intel microprocessors and microcontrollers (B1, B2, B11).
b4- Investigate the effect of different addressing modes for microprocessor and microcontroller (B5, B6).
b5- Solve engineering design based on the microcontrollers MCS-51 in mini-project (B12, B17).
b6- Recognize the connections for the microprocessor and microcontroller (B11, B16).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Write assembly code for Intel microprocessor and microcontroller (C5, C14, C15).
c2- Check and Debug syntax errors in the assembly code (C6, C12, C14).
c3- Use software assembler to convert the assembly code to machine code (C5, C14, C15).
c4- Design systems (mini-project) for MCS-51 depend on software simulator program (C6, C14, C15).
c5- Use the hardware kit to check the validation for their designs (C5, C6, C15).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group in mini-projects (D5, D7).
d2- Communicate effectively and present data and results in hard and soft copies (D3).
d3- Search for information in libraries and internet (D5, D7).
d4- Practice self-learning and preparing written reports (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A4, A9, A14, A15, A16, A18
B	Intellectual skills	B1, B2, B3, B4, B5, B6, B9, B11, B12, B13, B16, B17
C	Professional and practical skills	C5, C6, C12, C14, C15
D	General and transferable skills	D3, D5, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ The architecture of microprocessor and microcontroller.	3	2	--
➢ Assembly instructions for MCS-51.	3	1	4
➢ The Addressing modes for MCS-51.	2	1	--
➢ The instruction formats for MCS-51.	2	1	4
➢ The timers and counters.	3	2	2
➢ The interrupts and its priority.	3	2	4
➢ The serial and parallel communications with processors.	3	2	4
➢ The interface with external memories and PPI.	3	2	4
➢ The interface with input units (such as sensors, keypad …etc).	3	1	2

➢ The interface with output units (such as motors, monitors …etc)	3	1	2
➢ Task for mini-project.	2	--	4
Total hours	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1							1	1			1	1			1			
	a2	1	1		1		1						1			1	1	1		1			
	a3	1	1		1											1	1		1	1			
	a4	1	1	1	1		1									1			1	1			
	a5	1	1		1											1		1		1			
	a6	1	1		1	1										1			1	1			
	a7	1	1		1	1	1						1			1		1	1	1			
	a8	1	1		1							1				1	1		1	1			
	a9	1	1	1	1	1	1					1	1			1	1			1			
Intellectual Skills	b1	1	1	1	1							1	1			1	1			1			
	b2	1	1		1		1						1			1	1	1		1			
	b3	1	1		1											1	1		1	1			
	b4	1	1		1		1									1			1	1			
	b5	1	1		1											1		1		1			
	b6	1	1		1	1										1			1	1			
Applied Professional Skills	c1	1	1			1	1					1	1				1						
	c2						1					1	1				1						
	c3	1				1	1					1	1				1						
	c4	1				1	1					1	1				1						
	c5						1						1				1						
General Tran. Skills	d1	1		1	1	1						1	1						1				
	d2	1				1						1							1				
	d3											1											
	d4					1						1							1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Degrees
Semester Work: seminars, quizzes assignments and reports	By Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes:

Assem B., "The Microprocessor Based Systems", lecture note, 2015

6-2 Required books:

Rolin D. McKinlay, Janice G. Mazidi, Danny Causey and Muhammad Ali Mazidi, The 8051 Microcontroller, Prentice Hall, 2012

6-3 Recommended books:

Yogendra Gandole, A Text Book of Advanced Microprocessors and Microcontroller, Lambert Academic Publishing, 2012.

6-4 Periodicals, Web sites, etc.

http://www.intel.com
http://www.cpu-world.com
http://www.emu8086.com/
http://www.8052.com
http://www.keil.com/
http://www.mikroe.com/

7- Facilities required for teaching and learning:

- Hardware emulators and kits.
- Simulator software programs.
- Data show

Course coordinator: Dr. Assem Badr

Head of the Department: Prof. Dr. Said Gawish

Date: September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 421: Computer Architecture

A- Affiliation:

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology BSc Program

Date of specifications approval: September 2015

B - Basic information:

Title: Computer Architecture Code: CMP 421 Year/Level: Senior 1, First Semester

Credit Hours: 3 Lectures: 2 Tutorial/Exercise:2 Practical: -

Pre-requisite: CMP 211

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the basic features, basic concepts of the micro computer structure and architecture. Moreover the students will be familiar with the basic concepts of machine-level architecture, programming instruction formats and addressing modes. They should be able to recognize and identify the micro operations, memory organization, I/O units, arithmetic and logic unit operations (Addition, multipliers and division).

2 - Intended Learning Outcomes (ILOS)

a – Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Basic Structure of computers (A1,A2).
a2- Foundations of Computer Architecture (A3)
a3- Fundamentals of Arithmetic and logic units (A3,A4,A13).
a4- Different types of Addressing Modes (A5,A8).
a5- Different classifications of Secondary storage (A13).
a6- Architecture and organization of Memory unit (A8,A13,A15).
a7- Concepts of Operating system support (A1,A2,A13).
a8- Basic requirements for Programming the basic computer ((A15,A10)

b – Intellectual Skills:

On successful completion of the course, the student should be able to:

b1- Investigate on the Computer Architecture (B6,B5).

b2- Create a systematic approaches of different addressing modes (B3,B4,B12)
b3- Analyze different components constituting the micro computer system (B13)
b4- Manipulate different organizations of memory units (B4,B5,B7,B17).
b5- Assess and evaluate the characteristics and performance of A.L.U. (B1,B2, B5)
b6- Investigate on the different techniques for Programming the basic computer (B3)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- recognize and identify the structure of computer architecture (C2, C3)
c2- Evaluate the performance of A.L.U and control unit (C2, C3)
c3- Use a wide range of analytical tools, techniques, and software packages pertaining for programming the basic computer (C2, C3)
c4- Utilize computational facilities and techniques, to design different architectures of memories experiments. Then collect, analyze and interpret results (C2, C3).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group discussion and seminars(D1, D3,D6).
d2- Communicate effectively and present data and results orally and in written form(D3, D4).
d3- Use ICT facilities in presentations, and manage resources efficiently (D4, D5).
d4- Search for information's in references, journals and in internet(D7).
d5- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4,A5,A8,A10,A13,A15
B	Intellectual skills	B1,B2,B3,B4,B5,B6,B7,B12,B13, B17
C	Professional and practical skills	C2, C3
D	General and transferable skills	D1,D3,D4,D5,D6,D7,D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Basic Structure of computers	2	2	
➢ Addressing Modes	4	4	
➢ Arithmetic and logic units	4	4	
➢ Memory unit	4	4	
➢ Secondary storage	4	4	
➢ Computer Architecture.	4	4	
➢ Operating system support	4	3	
➢ Programming the basic computer	3	4	
➢ Seminars	1	1	
Total hours	30	30	-

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1								1				1		1		1			
	a2	1														1		1	1	1			
	a3	1														1		1		1			
	a4	1	1	1	1	1						1				1		1	1	1			
	a5	1			1											1		1		1			
	a6	1			1							1				1			1	1			
	a7	1	1	1	1	1						1				1			1	1			
	a8	1																					
Intellectual Skills	b1	1			1											1		1		1			
	b2	1	1													1		1		1			
	b3	1		1	1							1				1				1			
	b4	1			1							1				1		1	1	1			
	b5	1	1		1	1						1				1		1	1	1			
	b6	1	1	1		1						1											
Applied Professional Skills	c1	1			1	1										1		1	1				
	c2	1	1													1		1	1	1			
	c3	1		1		1						1							1	1			
	c4	1	1		1	1													1				
General Tran. Skills	d1			1		1						1							1				
	d2		1	1		1						1							1	1			
	d3	1	1									1								1			
	d4	1	1	1								1								1			
	d5			1								1								1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes: Lecture notes and handouts

Seham Ebrahim,Computer Architecture.Cairo :MAM Press

6-2 Required books

- William Stallings, (2010) Computer Organization And Architecture Designing For PERFORMANCE, 8th edition, Prentice Hall.
- M.Mano, (1996), Computer System Architecture, Prentice Hall.
- Thomas C.Bartee, (1991), Computer Architecture and Logic Design, Mc Graw Hill, 1991.

6-3 Recommended books:

None

6-4 Periodicals, Web sites, etc.:

https://www.eecs.berkeley.edu/Courses/Data/188.html
http://www.GenLib.org

7- Facilities required for teaching and learning:

- Computer Lab.
- Computer, Data show and Computer package.

Course coordinator:	Dr. Seham Ebrahim
Head of the Department:	Prof. Dr. Said Gawisha
Date:	September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

CMP 422: Computer Graphics and Man-Machine Interface

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology BSc Program

Date of specifications approval: September 2015

B - Basic information

Title: Computer Graphics and Man-Machine Interface

Code: CMP 422 **Year/level:** Senior 1, first Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2

Prerequisites: MNF 101 and CMP 421

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the basic elements of computer generated pictures, the mapping a real seen to 2D raster devices, the transformations applied to a 2D drawn seen on raster devices, the lightening-shading of a seen giving the locations of the light sources and the person looking at the scene. They should be able to apply the transformation to 3D seen and reflected to the projected on a computer generated pictures. Using the contentment and clipping techniques.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Comparing between the computer generated pictures and raster images (A1, A2)

a2- Realization of Application programs contains computer generated pictures(A4, A5).

a3- Projection of 3-D views on 2-D plane using parallel projection. (A4, A5,A12)

a4- Projection of 3-D views on 2-D plane based on perspective projection. (A4, A5, A12, A16).

a5- The lighting to a seen based on local reflection model. (A8, A16).

a6- The OPENGL to perform graphics based applications(A15, A16).

a7- The 2-D and 3-D transformations to objects (A8, A4).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1– Apply Transformations to shapes (B3, B2)

b2 – Analyze and problem decompositions (B1,B3, B7,B8)

b3 – Solve complex computation problems with less computational approaches (B10, B13).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Draw graphics based applications in 2D. (C1,C2,C3)

c2- Using of OPENGL for graphics based applications. (C5, C6,C15)

c3- Draw graphics based applications that has 3D views. (C4,C5, C13)

c4- Applying the transformations and its inverse to the 2D, and 3D pictures (C5,C7, C11).

c5- Analyze the Computer Graphic systems (C6, C7).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Communicate with others work in a team and involvement in group discussion (D1,D3, D8).

d2- Present data and results in soft and hard copy (D4, D6).

d3- Search for information in Computer Graphics and Man-Machine Interfacing. (D7, D9)

d4- Practice self-learning. (D7, D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A8, A12, A15, A16
C	Intellectual skills	B1,B2, B3, B7, B8, B10,B13
B	Professional and practical skills	C1, C2, C3,C4, C5,C6,C7, C11,C13, C15
D	General and transferable skills	D1, D3, D4,D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Computer generated Pictures and Raster Images.	2	1	
➢ Elements of computer Generated Pictures	2	1	2
➢ Drawing a Polylines and polygons.	2	1	2
➢ Drawing a General functions	2	1	2
➢ Filling a region:			
• Rows based filling	2	1	2
• Column based filling	2	1	2
• Seed filling	2	1	2
➢ Transformations			2
• 2D transformations	2	1	
• 3D transformations	2	1	2
• Composite transformations	2	1	2
• Inverse transforms			
➢ Projection			2
• Parallel Projection	2	1	
• Perspective Projection	2	1	2
➢ Lightening based on local reflection model.	4	2	6

➢ Containment and Clipping.	2	1	2
Total hours	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1			1					1				1		1	1				
	a2	1			1	1										1		1	1	1			
	a3	1	1	1	1	1						1	1			1		1	1	1			
	a4	١	١	١			1					١	١			1		1	1	1			
	a5	1		1	1	1	1					1	1			1	1	1	1	1			
	a6						1												1	1			
	a7	1	1	1	1	1	1					1	1						1				
Intellectual Skills	b1	1	1		1	1	1					1				1		1		1			
	b2	1			1	1										1		1	1	1			
	b3	1	1		1	1	1									1	1		1				
Applied Professional Skills	c1	1	1		1	1	1					1				1	1	1	1	1			
	c2	1			1	1										1		1	1	1			
	c3	1		1	1	1						1	1						1	1			
	c4	1		1	1	1						1	1				1		1	1			
	c5		1		1	1	1					1	1				1						
General Tran. Skills	d1	1	1	1								1							1				
	d2	1	1	1	1	1						1							1				
	d3		1	1	1	1	1					1							1	1			
	d4		1				1					1								1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes

Lectures Notes of Computer Graphics and Man-Machine Interface

6-2 Required books

Peter Shirley,(2004) Fundamentals of computer graphics

6-3 Recommended books

- JAMES D. FOLEY,(1999), Introduction to computer graphics, Addison-wesley,
- Eric Lengyel,(2012), Mathematics for 3D Game Programming and Computer Graphics, Cengage Learning.

6-4 Periodicals, Web sites, etc.

IEEE transactions on computer Graphics.

7- Facilities required for teaching and learning:

- Computer Labs Equipped with OPENGL software.
- Data show

Course coordinator:	Dr. Abdellatief Hussien Abouali
Head of the Department:	Prof. Dr. Saed Gawish
Date:	September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

CMP 423: Database Management

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology BSc Program

Date of specifications approval: September 2015

B - Basic information

Title: Database Management **Code:** CMP 423 **Level:** Senior 1, 8th Semester

Credit Hours: 4 **Lectures:** 3 **Tutorial/Exercise:** 2 **Practical:** --

Pre-requisite: MTH 102

C - Professional information

1 – Course Learning Objectives:

By the end of this course, students should be able to set data requirements of database users, perform data analysis, and build normalized data model. Also design and create database, Use respective language to manipulate data contained inside the database and build queries to respond to user requests and generate operational reports as needed

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, students should demonstrate knowledge and understanding of:

a1- Concepts and terminologies of database field (A1, A2)

a2- Data types (A4, A5)

a3- Elements of data (entities, attributes, and relationships) (A13, A15)

a4- Normalization (first, second, and third normal forms) (A16)

a5- SQL statements (A17)

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- Analyze user's data requirements (B2, B3)

b2- Investigate functional dependency among data attributes (B7, B8, B9)

b3- Eliminate unneeded redundancy (B15)

b4- Determine attribute data types (B12, B17)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Apply normalization form on the data model (C13)

c2- Design database schema (C13)

c3- Build proper SQL statements (C13).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Exchanging views among team members (D1, D3)

d2- Present query results to team members (D4)

d3- Search for knowledge and using ICT in search and presentation (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A13, A15, A16
B	Intellectual skills	B2, B3, B7, B8, B9, B12, B15, B17
C	Professional and practical skills	C13
D	General and transferable skills	D1, D3, D4, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Database concepts, terminology, and fundamentals	6	4	
➢ Data analysis	4	4	
➢ Building data models	4	4	
➢ Data model normalization forms	3	6	
➢ Analysing functional dependency in the data model	6	2	
➢ Converting data model into schema design.	6	2	
➢ Structured Query Language	10	6	
➢ Security in databases	6	2	
Total hours	45	30	

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1			1											1		1		1			
	a2	1			1	1						1				1		1					
	a3	1		1	1	1						1				1		1		1			
	a4	1		1	1	1						1				1		1		1			

	a5	1	1	1	1	1						1				1		1		1			
Intellectual Skills	b1		1	1	1							1				1		1	1	1			
	b2	1	1	1								1				1		1	1	1			
	b3	1		1	1	1						1				1		1	1	1			
	b4			1	1	1						1				1		1	1	1			
Applied Professional Skills	c1	1		1	1	1						1				1		1	1	1			
	c2	1	1	1	1	1						1	1			1		1	1	1			
	c3	1		1	1	1						1				1		1	1	1			
	c4																						
	c5																						
General Tran. Skills	d1		1	1								1						1	1				
	d2		1	1								1						1	1				
	d3																	1	1	1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

available

6-2 Required books:

- Carlos Coronel, Steven Morris and Peter Rob, Database Systems: Design, Implementation, and Management, Cengage Learning, 2012.
- Ramez Elmasri, Shamkant Navath, Fundamentals of database systems, Third edition, Addison Wesley,2000.
- C.J.Date, An introduction to database systems, seventh edition, Addison Wesley Longman Inc., 2000.

6-3 Recommended books:

None

6-4 Periodicals, Web sites, etc.

http://www.esp.org/db-fund.pdf
http://public.dhe.ibm.com/software/dw/db2/express-c/wiki/Database_fundamentals.pdf
http://www.ebook3000.com/Database/

7- Facilities required for teaching and learning:

- Datashow
- White board

Course coordinator: Dr. Adel Khedr
Head of the Department: Dr. Said Gawish
Date: September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 425: Information Systems

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology BSc Program

Date of specifications approval: September 2015

B - Basic information

Title: Information Systems **Code:**CMP425 **Level:** Senior1, First Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**2 **Practical:** -

Pre-requisite: CMP 310

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the main concepts of systems, data, information, information systems, the importance of information systems and information requirements in modern organizations and businesses, and the different types of information systems including internet-based Information Systems. They should be able to explore the systems development life cycle (analysis, design, and implementation) of any organization's information system.

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2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1-Basic concept of information systems (A1,A2,A3,).

a2- Importance of IS for business (A7, A8,A18,A20)

a3- Components of information systems (A2,A4,,A9).

a4- Different types of Information Systems such as MIS, DSS, Expert Systems (A8,A9).

a5- Information system development life cycle. (A8,A12).

a6- Transaction processing system TPS (A8,A19,A20).

a7- Basic concepts of internet-based applications in IS (A9,A2,A19).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1-Investigate on the different approaches in Information Systems (B1,B2,B3,B19).

b2- Create a systematic approaches of IS analysis and design (B12,B19)

b3- Analyze different Aspects of system's feasibility study (B12, B14,B18,B20)

b4- Manipulate different procedures of system development life cycle SDLC (B2,B3,B4,B19).

b5- Investigate on the different techniques for Internet-based Information systems (B1, B12)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Apply knowledge of science, and IT to deal with Information Systems (C13)

c2- Apply the life cycle and system approach techniques to analyse and design IS (C13)

c3- Use of analytical tools, techniques, and software packages for analysis and design of a real- world information system (C13)

c4- Use computational facilities and techniques for implementing real-world information system for some enterprise or organization (C13).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Work in a team and involve in group project (D1, D3,D7).

d2- Communicate effectively and present data and results orally and in written form(D3,D4,D6).

d3- Use ICT facilities in presentations, and manage resources efficiently (D4,D5).

d4- Search for information's in references, journals and in internet(D7).

d5- Practice self-learning(D5, D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A7,,A8, A 9, A12, A18,A19,A20
B	Intellectual skills	B1,B2, B3,B4,B12,B14 ,B18. B19
C	Professional and practical skills	C13
D	General and transferable skills	D1, D3, D4, D5,D6,D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Information systems concepts	2	2	
➢ System Approach of solving Business problems	2	2	
➢ System development Life Cycle:			
• System Analysis and design	2	2	
• Data Flow Diagrams	2	2	
➢ Databases systems	2	2	
➢ Information System for Business Operations			
• Marketing Information Systems	1	1	
• Manufacturing Information Systems	1	1	
• Human Resources Management Systems	1	1	
• Accounting Information Systems	1	1	
➢ Management Information Systems	2	2	

➢ Decision support systems	2	2	
➢ Artificial Intelligence and Expert Systems	2	2	
➢ Internet-Based Information Systems	4	4	
➢ Case Study	6	6	
Total hours	**30**	**15**	

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1								1				1	1	1		1			
	a2	1														1	1	1	1	1			
	a3	1														1	1	1		1			
	a4	1	1	1	1	1						1				1	1	1	1	1			
	a5	1		1	1							1	1			1	1	1	1	1			
	a6	1		1	1							1				1	1	1		1			
	a7	1	1	1	1	1						1	1			1	1	1	1	1			
Intellectual Skills	b1	1			1											1				1			
	b2	1	1													1				1			
	b3	1		1	1							1				1				1			
	b4	1			1							1				1				1			
	b5	1	1		1	1										1				1			
Applied Professional Skills	c1	1			1	1										1	1	1	1	1			
	c2	1	1													1		1	1	1			
	c3	1		1		1						1	1						1	1			
	c4	1	1		1	1											1		1	1			
General Tran. Skills	d1	1	1	1		1						1							1				
	d2	1	1	1		1						1	1						1				
	d3		1	1								1							1				
	d4		1	1								1							1				
	d5		1	1								1	1						1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	7-th Week	10
Project (analysis, design and implementation of a real-world Information System)	Due : 12th week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes:

None

6-2 Required books

- James A.O' Brine , "Introduction to Information Systems" 7th ed. Irwin, 1994.

6-3 Recommended books:

- Kendall& Kendall, Introduction to Information Technology, Pearson Education Inc., 2005.
- James A.O' Brine, Management Information System, International fourth edition, Mc Graw Hill, 1999.
- Dryden Press, Information Systems and the Internet, fourth edition ,1990
- Ralph Stairand George Reynolds, Fundamentals of *Information Systems*, Cengage Learning, 2013.

6-4 Periodicals, Web sites, etc.

- http://www.britannica.com/topic/information-system

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs

Course coordinator: Dr. Khaled Morsy
Head of the Department: Dr. Said Gawish
Date: September 2015

Modern Academy for Engineering & Technology

Computer Engineering and Information Technology Department

Course Specification

CMP 426: Logic Design-2

A- Affiliation

Relevant program: Electronic Engineering and Communication Technology BSc Program.
Computer Engineering and Information Technology BSc Program.

Department offering the program: Electronic Engineering and Communication Technology Department.
Computer Engineering and Information Technology Department.

Department offering the course: Computer Engineering and Information Technology BSc Program

Date of specifications approval: September 2015

B - Basic information

Title: Logic Design-2 **Code:** CMP 426 **Level:** Junior, First Semester

Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 1 **Practical:** 2

Pre-requisite: CMP 211

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the different logic modules, which are the main organs of a modern digital system. They should be able to design logic application by joining those modules in a complete operating system introducing the adequate performance analysis.

2 – Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- Problems of digital nature and sequential behavior to a state diagram description in case of small numbers of states problems (A1, A5).

a2- Evaluation of the minimum cost circuit realization (A4, A5, A14).

a3- The state table for a given sequential circuit (A2, A5).

a4- Estimation the size of the problem to choose either flip-flop or modular realization circuitry (A2, A4, A5).

a5- The proper layout design of the data path that fits the allocated problem requirements (A3, A4, A9,A14).

a6- The control system of the given problem which secures the correct sequence of output signals, which control the transfer of data among path and registers (A4, A14).

a7- The verification of the overall design correctness (A1, A4, and A14).

a8- The memory circuit required to transfer data from and to data path under control of control unit, and the associated address, and data registers fro executing microinstructions if exist (A2, A4, A9, and A14).

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- Create solutions for surrounding problems using the knowledge absorbed in this course (B3, B4, B12, and B14).

b2- Analyze any given system and extract the bugs in this system (B1, B4, B6, and B12).
b3- Create of revolutionary attempts to solve difficult sophisticated problems by logic approaches gained in course, giving rise up to simple, and cheep solutions (B3, B4, B8, and B17).
b4- Measure procedure and self correction means to proposed systems (B3, B6, B7, and B12).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:

c1- Design a special-purpose computing system satisfying special requirements with cheaper price than normal computers (C1, C3, C4, and C5).
c2- Realize a digital system operating in real-time, which have computational time much less than that of normal PC (C1, C2, C3, and C5).
c3- Modify existing digital system to achieve either better performance or special application (C1, C2, C3, C6).

d - General and transferable skills:

On successful completion of the course, the student should be able to:

d1- Use internet, references and journals for searching information (D3, D7, D9).
d2- Write a technical report for a given task and prepare its presentation (D3, D4, D6, D7).
d3- Join with team work (D1, D2, D5).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A9, A14
B	Intellectual skills	B1, B3, B4, B6, B7,B8, B12, B14, B17
C	Professional and practical skills	C1, C2, C3, C4, C5, C6
D	General and transferable skills	D1, D2, D3, D4, D5, D6, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Introduction	3	1	3
• Aims realized through the topics of this subjects.			
• Logic gate types (RTL, DTL, TTL, ECL) and others.			
➢ Synthesis of sequential logic circuits	8	4	8
• State diagrams and state table representation.			
• The mealy and Moore models.			
• Synthesis procedure of completely specified sequential circuits.			
➢ Building state diagram (table)			
➢ Using state reduction techniques (state equivalent) and specially the			
➢ State assignment techniques			
➢ Excitation functions derivation			
• Controllable counters as an example for a Moore model.			
➢ Analysis of sequential circuits			

➢ Modular design approaches using register transfers and data paths	6	3	6
• Digital systems subdivision (Data path and control).			
• Register transfer operations.			
• Arithmetic micro operations.			
• Logic micro operations.			
• Shift micro operations.			
• Multiplexer-based micro operations.			
• Trieste bus based transfers.			
• Memory based transfer.			
• A data path design proposed model.			
• Design of arithmetic logic unit (ALU).			
• Control word based design.			
➢ Sequencing control and algorithmic state machines (ASM)	7	4	7
• The control unit.			
• The ASM chart contruction.			
• An illustrative model (binary multiplier).			
• Hardwired control.			
• Realization of the sequencing part of the ASM chart using sequence			
• Mirco programmed control.			
➢ Memory system design	6	3	6
• Static RAMs (RAM cell and RAM bit slice)			
• Coincident selection.			
• Dynamic RAMs (Basic cell, addressing and refreshing).			
• Memory system hierarchy.			
• Cache memory.			
• Design using ROM-RAM combination.			
• Design involving decoder implementation.			
• Design using memory array configuration.			
• Increasing the size of physical memory space.			
Total hours	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1			1			1		1				1
	a2	1			1			1		1		1		
	a3	1			1					1		1		1
	a4	1	1	1			1	1			1			1
	a5	1		1	1		1			1	1	1		
	a6	1			1		1			1	1			1
	a7	1	1			1		1						1
	a8	1			1		1			1	1	1		
Intellectual Skills	b1	1				1				1				1
	b2	1				1				1		1		
	b3			1		1		1				1		1
	b4			1		1		1						1
Applied Professional Skills	c1	1	1	1				1				1		1
	c2	1	1	1				1		1				1
	c3		1	1			1				1	1		1
General Tran. Skills	d1		1					1						
	d2		1			1		1				1		1
	d3		1					1						1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes:

Digital logic circuit design (Theoritical + Practical).

6-2 Required books

- Mano, M.M, and Kime, C.R, Logic and Computer Design Fundamental, 2nd ed., Englewood cliffs, NJ: Prentice Hall, 2000.
- Nelson, V.P, Nagel, H.T., Carroll, B.D., and Irwin, J.D., Digital Logic Circuit Analysis and Design, NJ: Prentice Hall, 1995.

6-3 Recommended books:

- Warkely, J.F, Digital Design: Principles and Practices, 2nd ed. Englewood cliffs, NJ: Prentice Hall, 2000.
- Mano, M.M, Digital Design 2nd ed. Englewood cliffs, NJ: Prentice Hall, 1991.

6-4 Periodicals, Web sites, etc.

http://www.prenhall.com/mano

7- Facilities required for teaching and learning

- Logic lab. and Computers.
- Data show and Computer programs.

Course coordinator:	Prof. Dr. Mohi-Eldin Rateb
Head of the Department:	Prof. Dr. Mokhtar Abdelhalem
Date:	September 2015

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Appendix 3

شروط النجاح والتخرج وقواعد حساب التقدير

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الآتى بعد مستخرج من الشق القانونى للائحة الأكاديمية الحديثة للهندسة والتكنولوجيا بالمعادى للدراسة بالساعات المعتمدة (لائحة ٢٠١٢)

الباب الثانى

نظام الدراسة

مادة [٢]

يمنح وزير التعليم العالي بناءً على طلب مجلس إدارة الأكاديمية درجة بكالوريوس الهندسة والتكنولوجيا في أحد التخصصات التالية:-

[١] الهندسة الكهربية:

أ ـ هندسة الالكترونيات وتكنولوجيا الاتصالات .

ب ـ هندسة الحاسبات وتكنولوجيا المعلومات.

[٢] الهندسة الميكانيكية:

ـ هندسة التصنيع وتكنولوجيا الإنتاج .

[٣] الهندسة المعمارية:

ـ هندسة العمارة وتكنولوجيا البناء

وتتم الدراسة في هذه التخصصات حالياً بنظام الدراسة الفصلية. ، ويتم التحول للدراسة في هذه البرامج بنظام الساعات المعتمدة اعتباراً من العام الدراسي ٢٠١٢-٢٠١٣. ويسمح لمن يرغب من الطلاب بالتحويل من نظام الدراسة الفصلية إلى نظام الدراسة بالساعات المعتمدة بمقاصة لمن يرغب من الطلاب بحيث لا تقل عدد الساعات المعتمدة التي على الطالب أن يسجل فيها عن ٥٠% من مجموع الساعات المعتمدة للبرنامج ككل (لا تقل عن ٩٠ ساعة معتمدة)، على أن تستمر الدراسة بنظام الدراسة الفصلية للطلاب المقيدين بالأكاديمية قبل عام ٢٠١٢-٢٠١٣ ممن لم يحولوا للدراسة بنظام الساعات المعتمدة وذلك حتى تخرجهم.

مادة [٣]

تُمنح درجة البكالوريوس في الهندسة والتكنولوجيا للطلبة الذين يجتازون بنجاح دراسة مقررات بإجمالي ١٨٠ ساعة معتمدة، مع الحصول على المعدل التراكمي المطلوب للتخرج.

مادة [٤] : مدة الدراسة بنظام الساعات المعتمدة

- مدة الدراسة لنيل درجة البكالوريوس خمس سنوات موزعة على ١٠ فصول دراسية رئيسية ويمكن للطالب إنهاء متطلبات الدراسة قبل ذلك بفصل واحد على الأكثر.
- الحد الأقصى للدراسة ١٦ فصلا دراسيا ويفصل الطالب بعدها ويجوز إعادة قيده بموافقة مجلس الأكاديمية.

مادة [٥] : متطلبات الدراسة في برنامج الساعات المعتمدة

طبقاً لما ورد في الإطار المرجعي للوائح المعاهد الصناعية والهندسية التي تعمل بنظام الساعات المعتمدة فإن الجدول رقم (١) يبين نسب المقررات الإنسانية، و المقررات الأساسية، و المقررات الهندسية الأساسية، و المقررات الهندسية التخصصية، لكل من برامج بكالوريوس الحاسبات والاتصالات والعمارة والتصنيع و المدنى وقد روعي في اختيار نسب المقررات للبرامج توافقها مع متطلبات المجلس الأعلى للجامعات الموضحة بالجدول.

جدول رقم (١)

البيان (ساعات معتمدة)		برنامج اتصالات	برنامج حاسبات	برنامج عمارة	برنامج تصنيع
المواد الإنسانية **(8-10%)**	مواد إجبارية	١٢	١٢	١٤	١١
	مواد اختيارية	٤	٤	٤	٦
	النسبة المئوية الكلية	%٨,٩	**%**٨,٩	%١٠	%٩,٤
المواد الأساسية **(15-20%)**	مواد إجبارية	٣٦	٣٦	٢٨	٣٢
	مواد اختيارية	-	-	-	-
	النسبة المئوية الكلية	%٢٠	%٢٠	%١٥,٦	%١٧,٨
المواد الهندسية الأساسية **(30-35%)**	مواد إجبارية	٦٣	٦٣	٦٠	٥٤
	مواد اختيارية	-	-	-	٣
	النسبة المئوية الكلية	%٣٥	%٣٥	%٣٣,٣	%٣١,٧
المواد الهندسية التخصصية **(35-40%)**	مواد إجبارية	٥٠	٥٠	٦٠	٦٥
	مواد اختيارية	١٥	١٥	١٤	٩
	النسبة المئوية الكلية	%٣٦,١	%٣٦,١	%٤١,١	%٤١,١

مادة [٦]

يقوم طلبة المستوى الخامس بإعداد مشروع البكالوريوس الذى يحدد موضوعه مجالس الأقسام المختصة، وتخصص له فترة إضافية بعد الامتحان التحريري يحددها مجلس الأكاديمية بناء على اقتراح مجالس الأقسام المختصة، ويجوز أن يكون المشروع مقسماً على فصلين دراسيين متتاليين، ويراعى في اختيار الأقسام للمشاريع أن تكون ذات طبيعة تطبيقية أو نظرية أو خليطاً بينهما نابعة من الاحتياجات العملية وطبيعة الدراسة بكل قسم، ولا يتخرج الطالب إلا بعد أن يستوفي شروط النجاح في المشروع.

مادة [٧] : التدريب العملي

أولاً: تشمل الدراسة نظاماً للتدريب العملي لطلاب الأكاديمية في الأجازة الصيفية عقب أداء امتحانات آخر العام الدراسي بفترة قصيرة، على ألا يتعارض مع انتظام دراسة الطالب خلال الفصول الصيفية، وينقسم التدريب العملي إلى مرحلتين:

(أ) مرحلة التدريب الصيفي لطلبة المستوى الأول والثاني: هذا التدريب غير مقيم بساعات معتمدة، ولكن أداؤه إلزامي للتسجيل بالمستوى التالي، وفى حالة الظروف القهرية، يُفوض مجلس الأكاديمية فى السماح بأدائه في وقت لاحق.

(ب) مرحلة التدريب التخصصي لطلبة المستوى الثالث والرابع، ويقيم كل تدريب بثلاثة ساعات معتمدة، وتضاف نتيجة كل تدريب إلى تقييم الفصلين الأول والثاني من المستوى الخامس على التوالي.

ويتم التدريب بالتفاصيل الآتية:-

أ- التدريب الصيفي

(١) طلاب المستوى الأول

يتم هذا التدريب داخل صالات الرسم ومعامل الأكاديمية أو خارجها، ويشمل هذا التدريب الموضوعات العامة اللازمة للبناء المعرفى للمهندس، ويشتمل التدريب على الحاسبات والرسم الهندسي والاجهزة الكهربية والالكترونية والرسم المعمارى ومقدمة لاستخدام برامج الحاسب الآلى وأى موضوعات اخرى يقرها مجلس الاكاديمية. ويقسم الطلاب إلى مجموعات بحد أقصى ٢٥

طالب في المجموعة، ويتولى الإشراف على كل مجموعة عضو هيئة تدريس، وإثنين من أعضاء الهيئة المعاونة، واثنين من الفنيين، بالإضافة إلى مشرف إداري، ويتم التدريب لفترة أربعة أسابيع خلال فصل الصيف.

(٢) طلاب المستوى الثاني

يتم التدريب داخل الأكاديمية أو خارجها ، لتدريب الطلاب فى مجالات الدراسة التى يقترحها القسم ويقرها مجلس الاكاديمية ، ويقسم الطلبة إلى مجموعات بحد أقصى ٢٠ طالب في كل مجموعة، ويشرف على كل مجموعة عضو هيئة تدريس، ومعيد أو مهندس، وفني مرافق للمجموعة، بالإضافة إلى مشرف إداري على المجموعة، ويتم التدريب لفترة أربعة أسابيع خلال فصل الصيف.

ب – التدريب الصناعي التخصصي التطبيقى

(١) طلاب المستوى الثالث

يتم تدريب الطلبة بمواقع الإنتاج والتنفيذ بالمؤسسات والمصانع والشركات، التي تعمل في التخصص الذي يدرس به الطالب تحت إشراف أعضاء هيئة التدريس ومعاونيهم والفنيين ورجال الصناعة.

يعين لكل مجموعة من الطلاب أحد أعضاء هيئة التدريس، يفضل أن يكون هو المشرف الأكاديمي لمتابعة الطالب في التدريب وتلقي التقارير التي تفيد مدى تقدم الطالب في التدريب من الطالب نفسه ومن الجهة القائمة بالتدريب، وعقب انتهاء التدريب يقوم كل قسم بتشكيل لجنة من أعضاء هيئة التدريس لمناقشة الطالب في التدريب الذي قام به وإعطاؤه تقديره المناسب طبقا لما هو وارد بالجدول رقم (٢).

ومدة التدريب من أربعة إلى ستة أسابيع حسب الخطة التى توضع لهذا التدريب. ويمكن إجراء التدريب بمعامل الأكاديمية التخصصية، بناءً على توصية المرشد الأكاديمي ومجلس القسم وتصديق عميد الأكاديمية.و تضاف النقاط التي حصل عليها الطالب في هذا التدريب إلى النقاط التي حصل عليها في الفصل الدراسي الأول من المستوى الخامس.

(٢) طلاب المستوى الرابع

يتم التدريب بنفس الكيفية التي يتم بها تدريب المستوى الثالث على أن يضاف تقدير هذا التدريب إلى نتيجة الفصل الدراسي الثاني للمستوى الخامس. ويتم التدريب في مؤسسة غير التي أتم فيها تدريب المستوى الثالث إلا إذا استدعى الأمر استكمال التدريب في نفس المؤسسة، ويكون ذلك بناء على توصية المرشد الأكاديمي، وموافقة مجلس القسم. ويمكن تأدية هذا التدريب كذلك بمعامل الأكاديمية التخصصية بناءً على توصية المرشد الأكاديمي ومجلس القسم وتصديق عميد الأكاديمية.

ثانياً: (أ) الإشراف العام على التدريب:

يحدد مجلس الأكاديمية منسقا من كل قسم لتنسيق العمل مع قسم التدريب فى أول كل عام دراسى.

(ب) التمويل

١- يسدد كل طالب مبلغ ٥٠٠ جنيه عن كل سنة في مرحلة التدريب الصيفي (المستوى الأول والثاني) ويجوز زيادة هذا المبلغ طبقا لدراسة التكلفة الفعلية للتدريب بعد تصديق رئيس الإدارة المركزية المختص بوزارة التعليم العالى.

٢- يسدد كل طالب ما قيمته ثلاثة ساعات معتمدة عن كل مستوى في مرحلة التدريب الصيفى التخصصي لتغطية تكاليف التدريب(المستوى الثالث والرابع).

٣- توضع حصيلة التدريب في صندوق ذو طابع خاص (وحدة الورش والمعامل للتدريب) للصرف منه على أغراض التدريب، حسب اللوائح المنظمة للصندوق. ولمجلس إدارة وحدة الورش والمعامل للتدريب العملي أن يغير قيمة التدريب المالية طبقاً للظروف المحيطة.

٤- تقوم وحدة الورش والمعامل للتدريب العملى بسداد مستحقات المؤسسات القائمة بالتدريب، مضافاً إليها المصروفات الإدارية والمتابعة والإشراف والمناقشة من حصيلة الصندوق.

الباب الثالث
قبول الطلاب

مادة [٨]

يحدد وزير التعليم بعد اخذ رأى المجلس الأعلى لشئون المعاهد فى نهاية كل عام جامعى عدد الطلاب من ابناء جمهورية مصر العربية أو غيرهم الذين يقبلون فى الأكاديمية فى ضوء احتياجاته فى العام الجامعى التالى من الحاصلين على شهادة الثانوية العامة أو على الشهادات المعادلة ونظام قبولهم.

مادة [٩]

يكون ترشيح الطلاب للقبول بالأكاديمية عن طريق مكتب التنسيق ما لم يصدر قرار من وزارة التعليم بغير ذلك

مادة [١٠]

- يشترط في قيد الطالب في غير معاهد الدراسات العليا :

(١) أن يكون حاصلاً على شهادة الدراسة الثانوية العامة (علمى رياضة) أو ما يعادلها ويكون القبول بترتيب درجات النجاح ويقبل كذلك الحاصلون على دبلوم المدارس الثانوية الفنية فى بعض المعاهد ووفقاً للقواعد والشروط التي يحددها وزير التعليم.

(٢) أن يثبت الكشف الطبي خلوه من الأمراض المعدية وصلاحيته لمتابعة الدراسة وفقاً للقواعد التي يحددها المجلس الأعلى لشئون المعاهد.

(٣) أن يكون متفرغاً للدارسة بالأكاديمية وذلك وفقاً لأحكام اللوائح الداخلية للمعاهد.

(٤) أن يكون محمود السيرة حسن السمعة.

مادة [١١]

- يعطى كل طالب بطاقة شخصية خاصة تلصق عليها صورته ويوقعها عميد الأكاديمية وتختم بخاتم الأكاديمية ويجب تقديم هذه البطاقة في كل شأن دراسي ولا يسمح لأي طالب بحضور الدروس والمحاضرات والتمرينات العلمية وبتأدية الامتحانات إلا إذا كان يحمل بطاقته. على كل طالب مقيد بأحد المعاهد أن يثبت حضوره بالطريق الذي يحدده المعهد.

مادة [١٢]

- لا يجوز للطالب أن يقيد اسمه في أكثر من معهد في وقت واحد ولا يجوز له أن يجمع بين القيد في معهد غير تابع للوزارة أو أي كلية جامعية ولا يجوز إعادة قيد الطالب بأي معهد للحصول على شهادة سبق له الحصول عليها كما لا يجوز إعادة قيده للحصول على شهادة أخرى من معهد مماثل.

مادة [١٣] تحويل الطلاب ونقل قيدهم

تحويل ونقل قيد الطلاب إلى الأكاديمية لبدء الدراسة بالفصل الدراسى الثانى بقرار من الإدارة المركزية المختصة بوزارة التعليم العالى. وطبقاً لما ورد في نص المادة (٤١) من قانون ٥٢ لسنة ١٩٧٠ ولائحة المعاهد رقم (١٠٨٨) لسنة ١٩٨٧: تحويل ونقل قيد الطلاب فيما بين المعاهد وفق القواعد الآتية:

١) لا يجوز النظر في تحويل الطلاب المقيدين بالمستوى الأول بين المعاهد المتناظرة إلا إذا كان الطالب حاصلاً على الحد الأدنى للمجموع الذي وصل إليه القبول في المعهد المطلوب التحويل إليه، ويتم التحويل بموافقة مديري المعهدين.

٢) يجوز النظر في تحويل الطلاب المقيدين بمستوى أعلى من المستوى الأول بين المعاهد المتناظرة إذا وجدت ظروف اجتماعية أو صحية تقتضى التحويل وذلك بموافقة مديري المعهدين.

٣) يجوز نقل قيد الطالب المنقول إلى مستوى أعلى من المستوى الأول بأي من الكليات الجامعية أو من معهد إلى معهد غير مناظر بشرط أن يكون حاصلاً على الحد الأدنى لمجموع الدرجات الذي وصل إليه القبول في المعهد المطلوب النقل إليه سنة حصوله على الشهادة الثانوية أو المستوى الجاري أيهما أفضل للطالب وذلك بموافقة مديري المعهدين. وفي هذه الحالة يكون قيد الطالب فى اول مستوى للدراسة بالأكاديمية.

٤) يشترط في جميع الحالات السابقة ألا يكون الطالب المطلوب تحويله أو نقل قيده قد استنفذ فرص الرسوب، وألا يكون الطالب قد فصل لسبب تأديبي، وفى جميع الحالات يشترط تقديم طلب التحويل في المعهد المطلوب التحويل إليه قبل بدء الدراسة، ويجوز لمجلس إدارة الأكاديمية عند الضرورة القصوى قبول التحويل خلال الشهر التالي لبدء الدراسة، كما يشترط مراجعة وموافقة رئيس الإدارة المركزية المختصة.

٥) يجوز نقل قيد الطلاب المفصولين بغير الطريق التأديبي من الكليات العسكرية أو كلية الشرطة لعدم الصلاحية للحياة العسكرية وكذا المفصولين لإستنفاذ مرات الرسوب بالمعاهد التي مدة الدراسة بها أربع سنوات مستجدين بالمستوى الأول بشرط أن يكون الطالب حاصلاً على المجموع الكلى والمواد المؤهلة، إن وجد، سنة حصوله على الثانوية العامة. وان يكون تقديم طلب الالتحاق فى السنة الدراسية التى فصل الطالب خلالها او فى السنة الدراسية اللاحقة بها على الأكثر إذا كان فصله قد تم بعد بدء الدراسة بالمعهد فى السنة السابقة على تقديمه بطلب الالتحاق.

وطبقاً لما ورد في نص المواد (٤٢،٤٤) من قانون ٥٢ لسنة ١٩٧٠ ولائحة المعاهد رقم (١٠٨٨) لسنة ١٩٨٧:

- يجوز أن يقبل بالأكاديمية الطلاب الذين استنفذوا مرات الرسوب في الكليات والمعاهد العالية وفقاً للقواعد الآتية:-

(أ) أن يكون الطالب مقيدا فى الكلية أو المعهد فى السنة الدراسية السابقة على السنة التى يلتحق فيها بالأكاديمية.

(ب) أن يكون حاصلاً في الشهادة الثانوية العامة (علمى رياضة) أو ما يعادلها على مجموع يؤهله للالتحاق بالأكاديمية في عام حصوله على تلك الشهادة أو في عام التحاقه بالأكاديمية أيهما أفضل للطالب.

ويكون التحاق هؤلاء الطلاب بالمستوى الأول مستجدين، وتقدم أوراق هؤلاء الطلاب إلى الاكاديمية لإرسالها للإدارة المختصة بالوزارة ويكون قبولهم بموافقة مجلس إدارة الاكاديمية .

- يجوز قيد وإعادة قيد الطالب في الحالات الآتية:-

١) الطالب المستجد الذي لم يستكمل إجراءات قيده لعذر مقبول.

٢) الطالب الذي سحب أوراقه وهو مقيد بالأكاديمية وقدم عذراً.

٣) الطالب الذي لم يتقدم لمكتب التنسيق في سنة حصوله على الثانوية العامة لعذر مقبول.

وفى جميع هذه الحالات يعتبر عام رسوب السنة التى تنقضى دون ان يقيد فيها الطالب نفسه ويكون القيد أو إعادة القيد وبقرار من رئيس الإدارة المركزية المختص أو بموافقة مجلس إدارة الأكاديمية على حسب الاحوال.

- يجوز لمجلس أدارة الأكاديمية أن يوقف قيد الطالب لمدة سنة دراسية ولا تزيد المدة عن سنتين أذا تقدم بعذر مقبول يمنعه من الانتظام فى الدراسة و يجوز لرئيس الإدارة المركزية مد هذه المدة بحد أقصى ضعف مدة الدراسة بالأكاديمية عند الضرورة القصوى.

البـــاب الـــرابـــع
الامتحانات

مادة (١٤)

- إذا فصل الطالب من الأكاديمية بسبب استنفاذ مرات الرسوب فى مقرر إجبارى أو أكثر يمكن بموافقة مجلس أدارة الأكاديمية أعادة قيده بالأكاديمية كطالب مكن الخارج مع حضور التمارين العملية ويكون أعادة القيد بحد أقصى ثلاثة فصول دراسية فيما رسب فيه الطالب.
- يسدد الطالب التكلفة الكاملة لدراسته فى المقررات المسجل فيها طبقاً لأخر حساب ختامى للأكاديمية بالإضافة إلى رسم إعادة قيد يحدده مجلس أدارة الأكاديمية على أن يتحول إلى طالب نظامى مرة أخرى بعد انتفاء سبب فصله من الأكاديمية.

مادة (١٥)

- يمكن للطالب الانقطاع عن الدراسة لمدة تزيد عن ثلاثة فصول دراسية بعذر مسبق يقبله مجلس إدارة الأكاديمية يواصل بعده الدراسة.
- أما إذا انقطع الطالب عن الدراسة لمدة أقصاها ثلاثة فصول دراسية بعذر مسبق يقبله مجلس إدارة الاكاديمية فيمكن له ان يواصل دراسته على ان تحسب له المقررات السابق له النجاح فيها بدرجة (جيد) على الاقل ويخضع تخرجه لأية متطلبات جديدة فى الفصل الذى اعيد قيده فيه بالإضافة لإعادته للمواد التى حصل فيها على تقدير مقبول على الأكثر.
- يفصل الطالب من الأكاديمية إذا انقطع الطالب عن الدراسة بدون عذر مسبق لفترة فصلين دراسيين أو إذا انقطع عن الدراسة لنفس هذه المدة رغم رفض مجلس إدارة الأكاديمية للعذر الذى تقدم به.
- أما إذا انقطع الطالب عن الدراسة لمدة تزيد عن سته فصول دراسية عادية بعذر مسبق يقبله مجلس إدارة الأكاديمية فيمكنه العودة للدراسة بالأكاديمية على ان يعامل معاملة الطالب المستجد ولا تحسب له اية نقاط عن المقررات التى سبق له النجاح فيها قبل انقطاعه.

مادة (١٦)

طبقا للمادة (٥٠) من القانون رقم (٥٢) لسنة ١٩٧٠ ولائحته التنفيذية الصادرة بقرار وزير التعليم العالى رقم ١٠٨٨ لسنة ١٩٨٧ بالنسبة للمعاهد العالية لخاصة فيكون عميد الأكاديمية هو الرئيس العام للامتحانات بالأكاديمية والوكيل المختص نائبا له وأن تشكل لجان العمل للامتحانات وفقا للقواعد المنظمة لذلك بالأكاديمية وعلى ان يعتمد هذا التشكيل من رئيس القطاع المختص.

مادة (١٧)

ترسل الاكاديمية الى الإدارة المختصة بوزارة التعليم العالى قبل بدء موعد الامتحان بشهر على الأقل كشوفا من ثلاث صور بأسماء الطلاب الذين سوف يتقدمون للامتحان سواء فى امتحان النقل أو الامتحان النهائى، وتقوم الإدارة المختصة بمراجعة هذه الكشوف للتأكد من صحة قيد الطلاب بالأكاديمية واحقيتهم فى تأدية الامتحان ويستبعد الطلاب الذين لا حق لهم فى تأدية الامتحان ثم تعتمد هذه الكشوف وتحفظ صورة منها بالإدارة العامة لشئون الطلاب والامتحانات وترسل صورة للأكاديمية وتسلم الصورة الثالثة لرئيس عام الامتحان للعمل بمقتضاها فى امتحان نهاية العام الدراسى.

مادة (١٨)

تعلن نتيجة امتحان النقل بعد مراجعتها من الإدارة المختصة بوزارة التعليم العالى واعتمادها من مجلس إدارة الاكاديمية كما تعلن نتيجة امتحان البكالوريوس بعد مراجعتها من الإدارة المختصة واعتمادها من وزير التعليم ولا تعلن نتيجة الطلاب ولا يخلى طرفهم إلا بعد سداد جميع الرسوم والمصروفات المستحقة عليهم.

مادة (١٩)

- تقوم الأكاديمية بتحرير شهادات مؤقته لخريجى السنوات النهائية يوقعها عميد الأكاديمية موضحا بها (الاسم- تاريخ الميلاد – جهة الميلاد – دور التخرج- مشروع التخرج – التقدير العام). كما تقوم أيضا بتحرير (شهادات تقديرات النجاح فى كل مادة).
- كما تقوم الأكاديمية بتحرير الشهادات النهائية للخريجين محررا بها تاريخ منح المؤهل من تاريخ اعتماد وزير التعليم لنتيجة الامتحان وترسل الى وزارة التعليم العالى لمراجعتها واعتمادها من الأستاذ الدكتور الوزير.

البـــاب الخامس

قواعد التدريس والقيد والتسجيل وتـقديرات النجاح

مادة [٢٠] : الأقسام العلمية المشاركة في تنفيذ برامج الساعات المعتمدة

يختص كل قسم من أقسام الأكاديمية بالتدريس وإجراء البحوث التى تخص مقرراته طبقا لبرامج الساعات المعتمدة وجداول النظام الكودي للمقررات الدراسية وتفاصيلها.

مادة [٢١] : المقررات العامة

يعهد مجلس الأكاديمية إلى قسم أو أكثر بتدريس المقررات العامة ذات الكود (عام) تحت الإشراف المباشر لوكيل الأكاديمية.

مادة [٢٢] : شروط القيد

يتم القيد للدراسة بنظام الساعات المعتمدة اعتباراً من العام الدراسي ٢٠١٢-٢٠١٣ للطلبة الحاصلين على شهادة الثانوية العامة قسم رياضيات أو ما يعادلها، ممن تم توزيعهم عن طريق مكتب التنسيق أو المحولين من كليات أخرى طبقاً للشروط التي يضعها المجلس الأعلى للجامعات أو المحولين من نظام الدراسة الفصلية إلى نظام الدراسة بنظام الساعات المعتمدة من طلاب الأكاديمية، بحيث لا يتم نقل أكثر من ٥٠% من الساعات المعتمدة من إجمالي ما تم دراسته بالنظام الفصلي طبقاً لما ورد في المادة ٢٨ من قانون ٥٢ لسنة ١٩٧٠.

مادة [٢٣] : ساعات التدريس بنظام الساعات المعتمدة

(أ) ساعات المحاضرات: ١ ساعة محاضرة تساوي ١ ساعة معتمدة

(ب) ساعات التمـــارين : تمرين مدته ١ ساعة يساوي صفر

تمرين مدته من ٢ إلى ٣ ساعات يساوي ١ ساعة معتمدة

(ج) ساعات المعمل والتطبيقات العملية: ساعتين معمل أو تطبيقات تساوي ١ ساعة معتمدة

تتم الدراسة باللغة الانجليزية، وتضع الأكاديمية نظاماً للتأكد من مستوى الطالب في اللغة الانجليزية، ويستثنى من ذلك بعض المقررات الإنسانية والهندسة المعمارية والمدنية، ويكون الامتحان بنفس اللغة التي يدرس بها المقرر.

مادة [٢٤] : مواعيد الدراسة والقيد

يقسم العام الدراسى بالأكاديمية إلى ثلاثة فصول دراسية على النحو التالي :

الفصل الدراسي الأول : يبدأ في بداية العام الدراسى فى شهر سبتمبر ولمدة ١٥ أسبوع دراسى.

الفصل الدراسي الثاني : يبدأ عقب إجازة منتصف العام ولمدة ١٥ أسبوع دراسى.

الفصـل الصيفـــــي : يبدأ خلال أسبوعين من نهاية امتحانات الفصل الدراسى الثانى ولمدة ٨ أسابيع دراسية.

ويتم القيد لأي مرحلة خلال الأسابيع الثلاثة السابقة لبدء الفصل الدراسي بشرط استيفاء شروط القيد ودفع الرسوم المقررة، ويشترط للتسجيل في أي مقرر ألا يقل عدد الطلبة الراغبين في التسجيل عن عشرة طلاب، ويمكن أن يقل هذا العدد في الحالات الاستثنائية بموافقة مجلس أدارة الأكاديمية.

مادة [٢٥] : شروط التسجيل للدراسة بنظام الساعات المعتمدة

- يتقدم الطالب لتسجيل المقررات كل فصل دراسي، وبحد أقصى ١٨ ساعة معتمدة، بشرط استيفاء شروط التسجيل في كل مقرر، وبعد استشارة المرشد الأكاديمي، وفي المواعيد المحددة بتوقيتات التسجيل، مادة ١٧ من قانون ٥٢ لسنة ١٩٧٠، وقواعده التي تصدرها الأكاديمية سنوياً وتنشر في دليل الطالب، ولا يعتبر التسجيل نهائياً إلا بعد دفع رسوم الخدمة التعليمية المقررة لكل فصل دراسي.
- يتم تقسيم المقررات على المستويات التصاعدية الخمس التالية الموضحة تفصيلا بخريطة المقررات. ويتم التسجيل للمقررات طبقا لخريطة المقررات مع الالتزام بتسجيل مقررات المستويات الأدنى واستكمال ساعات التسجيل من المستوى الأعلى.

Freshman	المستوى الأول	-١
Sophomore	المستوى الثانى	-٢
Junior	المستوى الثالث	-٣
Senior 1	المستوى الرابع	-٤
Senior 2	المستوى الخامس	-٥

- يمكن للطالب الذى يبلغ معدله التراكمى ٣,٣ أو أكثر، التسجيل فى أكثر من ١٨ ساعة معتمدة وبحد أقصى ٢١ ساعة معتمدة فى الفصل الدراسى التالى لحصوله على هذا المعدل ابتداء من المستوى الثانى.
- يمكن للطالب التسجيل فى الفصل الدراسى الصيفى فى مقررات لا تزيد ساعاتها المعتمدة عن ٦ ويكون تسجيل الطالب اختياريا فى هذا الفصل الدراسى للنجاح فى مقرر رسب فيه أو رفع درجاته فى مقررات سبق نجاحه فيها أو لدراسة مقرر واحد من المستوى التالى يشرط حصوله على معدل تراكمى ٣,٣ او أكثر فى الفصل الرئيسى السابق . ويجوز أن يتم التسجيل بحد أقصى ٩ ساعات معتمدة لدواعى التخرج أو اجتياز متطلبات التسجيل.
- عند التسجيل فى مقررات جديدة، يراعى نجاح الطالب فى المقررات المؤهلة طبقا للائحة الدراسية.
- لا يجوز للطالب أن يدرس مقرر ومتطلبه السابق فى نفس الفصل الدراسى إلا إذا كان تخرجه يتوقف على ذلك.
- الطالب المتأخر عن مواعيد التسجيل، لا يتم تسجيله في المقررات الدراسية إلا إذا كان هناك مكان له، وللأكاديمية أن تقرر رسوم تأخير يحددها مجلس إدارة الأكاديمية تتناسب مع مدة التأخير بحد أقصى ٢٥% من رسوم التسجيل.
- على الطالب تحقيق معدل تراكمى لا يقل عن (٢) فى اى وقت فإذا قل يتم إنذاره ولا يصرح له بالتسجيل فى الفصل التالى لأكثر من ١٢ ساعة معتمدة وعند التكرار لفصلين متتاليين بعد ذلك يتم فصله نهائيا.
- يسمح للطالب بإعادة التسجيل في أي مقرر رسب فيه، ويعيده دراسة وامتحاناً بعد دفع رسوم الخدمة التعليمية المقررة. وفي هذه الحالة يحسب تقديره فيه بحد أقصى٢ (C) ولا يدخل تقدير الرسوب السابق في حساب المتوسط التراكمي.
- للطالب الحق في تحسين متوسطه التراكمي بإعادة التسجيل في مقرر أو أكثر يكون قد سبق حصوله فيه على تقدير أقل من (٢). ويحسب له التقدير الجديد لهذا المقرر، ويتم حساب المتوسط التراكمى طبقا للتقدير الأخير.
- يمكن تسجيل طلاب كمستمعين في بعض المقررات نظير رسوم تقررها الأكاديمية، فى حدود ٧٥% من رسوم التسجيل للطلاب النظاميين، لو كان هناك مكان لهم، وذلك بعد تسجيل الطلاب النظاميين، ولا يحق لهم دخول الامتحان أو الحصول على شهادة بالمقررات.

المراقبة الأكاديمية

- إذا حصل الطالب عند نهاية أى فصل دراسى رئيسى على معدل تراكمى أقل من (٢) يوضع تحت المراقبة الأكاديمية.
- أثناء وضع الطالب تحت المراقبة الأكاديمية لا يسمح له بالتسجيل فى مقررات تزيد عن ١٢ ساعة معتمدة فى الفصل الدراسى الرئيسى الواحد.
- يلتزم الطالب أثناء وضعه تحت المراقبة الأكاديمية بالاجتماع مع مرشده الأكاديمى كل أسبوعين على الأقل، ويقوم المرشد الأكاديمى بمتابعة التحصيل الدراسى للطالب مع أساتذته.

حالات عرض الطلاب على مجلس الأكاديمية للنظر فى فصلهم

- الطالب المستجد الذى لم يجتاز ٣٠ ساعة معتمدة على الأقل خلال العامين الدراسيين الأولين (أو أول أربعة فصول دراسية أساسية).
- الطالب المستجد الذى لا يتمكن من رفع متوسط نقاطه التراكمى إلى ١,٥ فى نهاية الفصل الدراسى الرئيسى الرابع من بدء التحاقه بالأكاديمية.

- الطالب الذى يقل متوسطه التراكمى عن (٢) فى سته فصول دراسية متصلة أو فى ثمانية فصول دراسية غير متتالية.
- الطالب الذى لا يتمكن من استكمال متطلبات التخرج خلال ١٦ فصل دراسى رئيسى، عدا الفصول التى يتم فيها إيقاف قيده بعذر يقبله مجلس الأكاديمية. ويجوز إعادة قيده بشرط أن يزيد عدد الساعات المعتمدة التي إجتازها بنجاح عند إعادة القيد على ١٣٥ ساعة معتمدة. وفى هذه الحالة يمكن لمجلس الأكاديمية أن يمنح هذا الطالب فرصا إضافية بحد أقصى أربعة فصول دراسية رئيسية.
- الطالب الذى ينقطع عن الدراسة فصلين دراسيين أساسيين متتاليين أو ثلاث فصول دراسية أساسية غير متتالية دون عذر تقبله الأكاديمية.

مادة [٢٦] : رسوم الدراسة

- وتظل قيمة الساعة المعتمدة كما هي لأي طالب من وقت التحاقه بالأكاديمية وحتى تخرجه. وتزاد قيمة الساعة المعتمدة سنوياً بنسبة ٥% من قيمتها في العام السابق وذلك لكل دفعة من الطلبة الجدد. ويجوز زيادة هذا المبلغ طبقا لدراسة التكلفة الفعلية للتعليم بعد تصديق رئيس الإدارة المركزية المختص بوزارة التعليم العالى.
- يسدد الطالب رسوم تسجيل لمقررات الفصل الدراسى الصيفى بزيادة ٢٥% عن رسوم التسجيل للفصول الرئيسية.
- أما بالنسبة للطلبة الوافدين من غير أبناء جمهورية مصر العربية، فيقومون بتسديد الرسوم الإضافية وقيمة رسوم الخدمة التعليمية بالعملة الأجنبية، حسب القيمة التي يحددها وزير التعليم العالي، بشرط أن تكون هذه العملة قابلة للتحويل، ويمكن للطلبة الوافدين تسديد رسوم الخدمة التعليمية بالعملة المحلية، وذلك بتصديق من رئيس مجلس إدارة الأكاديمية.
- يتم تحصيل رسوم الخدمة التعليمية كل فصل دراسي ويعد السداد شرطا لإتمام التسجيل.
- يتم حساب رسوم الخدمة التعليمية طبقاً لعدد الساعات المعتمدة التي يسجل فيها الطالب لكل من الفصل الدراسي الأول والفصل الدراسي الثاني، بحد أدنى ما يقابل رسوم خدمة تعليمية لعدد ١٢ ساعة معتمدة لكل فصل دراسى، إلا إذا كان عدد الساعات المعتمدة المتبقية للطالب للحصول على درجة البكالوريوس أقل من ذلك فتتم محاسبته على الساعات المعتمدة المتبقية فقط للدراسة. وتكون رسوم الخدمة التعليمية للفصل الصيفي طبقاً لعدد الساعات المعتمدة التي يسجل فيها الطالب.
- يتم تحصيل رسوم التسجيل المقررة للوزارة سنويا فى بداية كل عام دراسى.

مادة [٢٧] : متطلبات الحصول على درجة البكالوريوس بالساعات المعتمدة

يشترط لتخرج الطالب ما يلى:

- أن يجتاز الطالب عدداً من الساعات المعتمدة المقررة، ومقدارها ١٨٠ساعة معتمدة، وبمعدل تراكمى لا يقل عن (٢) متضمنة مشروع البكالوريوس طبقا للمادة [٦].
- أن يؤدى التدريب العملى طبقا لما ورد في المادة [٧].
- أن يجتاز بنجاح الرخصة الدولية لقيادة الحاسب الآلي **(ICDL)**.

مادة [٢٨] : المرشد الأكاديمي للدارسين بنظام الساعات المعتمدة

- يعين وكيل الأكاديمية لكل طالب، عند التحاقه بالدراسة، مرشداً أكاديمياً من بين أعضاء هيئة التدريس، يمكن أن يستمر معه حتى نهاية الدراسة.
- يلتزم المرشد الأكاديمي بمتابعة أداء الطالب، ومعاونته في اختيار المقررات كل فصل دراسي، ويمكن للمرشد الأكاديمي أن يطلب وضع الطالب تحت المراقبة الاكاديمية لفصل دراسي واحد، مع خفض عدد الساعات المسجل فيها طبقا لما ورد بالمادة[٢٤].

مادة [٢٩] : شروط التعديل والإلغاء والانسحاب وإيقاف القيد

- يحق للطالب تغيير مقررات سجل فيها، بأخرى خلال أسبوعين من بدء الدراسة، ولا يسري ذلك على الفصل الصيفي.

- يحق للطالب الانسحاب من المقرر خلال ثمانية أسابيع على الأكثر من بداية الدراسة بالفصلين الأول والثاني وثلاثة أسابيع على الأكثر في الفصل الصيفي وفى هذه الحالة لا ترد له الرسوم.
- الطالب الذي يرغب في الانسحاب من فصل دراسي، لظروف المرض أو بعذر تقبله الأكاديمية، عليه التقدم بطلب لشئون الطلاب، ويحصل على موافقة مجلس الأكاديمية على الانسحاب، دون استرداد ما سبق سداده من رسوم، ويكون هذا الانسحاب قبل الامتحان النهائى لهذا الفصل بأسبوع واحد على الأقل. ويقوم بإعادة المقررات التي سجل فيها، في فصل دراسي لاحق دراسة وامتحاناً بعد سداد رسوم الخدمة التعليمية المقررة، ولا تحسب عليه كمرة رسوب.

مادة [٣٠] : تقديرات المقررات الدراسية

- تقدر نقاط كل مقرر على النحو الموضح بالجدول رقم (٢):

جدول رقم (٢)

التقدير	عدد النقاط	التقدير المكافئ	النسبة المئوية المناظرة
A+	4.0	ممتاز (+)	٩٥% وأعلى
A	3.7	ممتاز	٩٠% حتى أقل من ٩٥%
A-	3.3	ممتاز (-)	٨٥% حتى أقل من ٩٠%
B+	3.0	جيد جداً (+)	٨٠% حتى أقل من ٨٥%
B	2.7	جيد جداً	٧٥% حتى أقل من ٨٠%
C+	2.3	جيد (+)	٧٠% حتى أقل من ٧٥%
C	2.0	جيد	٦٥% حتى أقل من ٧٠%
D+	1.7	مقبول (+)	٦٠% حتى أقل من ٦٥%
D	1.3	مقبول	٥٥% حتى أقل من ٦٠%
D-	1.0	مقبول (-)	٥٠% حتى أقل من ٥٥%
F	صفر	راسب	أقل من ٥٠%

- يتم إنذار الطالب الذى يحصل على تقدير أقل من (٢) فى أى مقرر لإعادة دراسته لتحسين النتيجة إلى (٢) على الأقل.
- المقررات التي يسجل فيها الطالب كمستمع، أو التي يطلب فيها النجاح فقط، أو لم يكملها لسبب قبلته الأكاديمية، ولا تدخل في حساب متوسط النقاط، يرصد له أحد التقديرات التالية:

التقدير		المدلول
S	Satisfactory	مرضي
U	Unsatisfactory	غير مرضي
W	Withdrew	انسحاب
AU	Audit	مستمع
F	Fail	راسب
P	Pass	ناجح

مادة [٣١] : حساب متوسط النقاط (GPA)

- لا يعتبر الطالب ناجحاً في أي مقرر إلا إذا حصل على تقدير D- على الأقل.
- لا يحصل الطالب على البكالوريوس، إلا إذا حقق متوسط نقاط قدره (٢) على الأقل.
- تحسب نقاط كل مقرر على أنها عدد ساعاته المعتمدة مضروبة فى عدد النقاط التى حصل عليها الطالب، جدول رقم (٢).

- يحسب مجموع النقاط التي حصل عليها الطالب في أي فصل دراسي، على أنها مجموع نقاط كل المقررات التي درسها في هذا الفصل الدراسي.
- يحسب متوسط نقاط الطالب لأي فصل دراسي (المتوسط الفصلي GPA)، على أنه ناتج قسمة مجموع النقاط التي حصل عليها الطالب في هذا الفصل، على مجموع الساعات المعتمدة لهذه المقررات. ويكون تقدير الطالب فى هذا الفصل وفقا للجدول رقم (٢).
- يحسب متوسط نقاط التخرج (بعد نجاحه في مجمل متطلبات التخرج)، على أنها ناتج قسمة مجموع نقاط كل المقررات التي درسها الطالب على مجموع الساعات المعتمدة لهذه المقررات متضمنة المقررات التى أعادها الطالب (سواء لسابق رسوبه فيها أو للتحسين وتحتسب نقاط هذه المقررات فى المرة الأخيرة فقط) ويكون تحديد التقدير التراكمى وفقا للجدول رقم (٢).

مثال : بفرض حصول الطالب في فصل دراسي على التقديرات الموضحة بالجدول رقم (٣):
بالرجوع إلى الجدول رقم (٢) يتم تحديد عدد النقاط للتقدير الذي حصل عليه الطالب لكل مادة، وبضرب عدد النقاط في عدد الساعات المعتمدة لكل مادة وجمع هذه النقاط، يتم احتساب إجمالي النقاط. وحاصل قسمة إجمالي النقاط على إجمالي عدد الساعات المعتمدة لكل المواد هو متوسط نقاط الفصل.

- تمنح مرتبة الشرف للطالب الذى لا يقل المعدل التراكمى الفصلى له عن **3.3** خلال جميع الفصول الدراسية الرئيسية، على ألا يكون الطالب قد رسب فى أى مقرر خلال دراسته لمرحلة البكالوريوس.

جدول رقم (٣)

المادة	عدد الساعات المعتمدة	التقدير	النقاط	عدد النقاط المحتسبة
لغة انجليزية	٣	A+	٤	١٢
برمجة حاسب	٣	C	٢	٦
فيزياء	٣	B+	٣	٩
كيمياء	٣	A+	٤	١٢
إنتاج	٣	C	٢	٦
إجمالي عدد الساعات المعتمدة = ١٥ متوسط نقاط الفصل الدراسى **(GPA)** = ٤٥ ÷ ١٥ = ٣				إجمالي عدد النقاط = ٤٥

مادة [٣٢] : تعريف حالة الطالب الدارس بنظام الساعات المعتمدة
كلما أكمل الطالب ٢٠% من متطلبات التخرج اعتبر منتقلاً من مستوى إلى مستوى أعلى منه (المستويات من ١ إلى ٥)، ولا يتطلب ذلك تحديد نوعية أو مستوى المقررات التي أكملها الطالب، ويعتبر ذلك نوعاً من التعريف بموقع الطالب بالأكاديمية.

مادة [٣٣] : أسلوب تقييم الدارس بنظام الساعات المعتمدة

(أ) توضح التفاصيل الآتية بهذه اللائحة توزيع درجات كل مقرر بين: أعمال الفصل، امتحان عملي/شفوي، امتحان نصف الفصل، الامتحان التحريري النهائي.

(ب) يعقد لكل مقرر امتحان تحريري في نهاية الفصل الدراسي لا تقل درجته عن ٦٠% من مجموع درجات المقرر، وذلك بواقع ٦٠% للامتحان التحريرى للمواد ذات الشق العملي و ٢٠% أعمال السنة و٢٠% للامتحان العملي وبواقع ٧٠% للامتحان التحريري للمواد التى لا تتضمن شق عملى و٣٠% لأعمال السنة. مدة الامتحان ٣ ساعات لجميع المواد عدا المواد الإنسانية فتكون ساعتين فقط. يستثنى من ذلك مقررات تحددها اللائحة مثل مشروع التخرج والتدريب الصيفي والندوات والأبحاث، وبعض المواد التي تخص تخصص العمارة، وهي على وجه التحديد مواد التصميم المعماري، التصميمات التنفيذية، الإنشاء المعماري ومواد البناء، الظل والمنظور، تطبيقات حاسب آلى، تخطيط المدن والإسكان، التصميم العمراني والتدريب البصرى. حيث تشكل درجات التحريري ٤٠% من مجموع

الدرجات و ٦٠% لأعمال السنة، ومدة امتحان مادتي التصميم المعماري والتصميمات التنفيذية هي ٧ ساعات، ومواد الانشاء المعمارى والظل والمنظور والتصميم العمرانى ٥ ساعات، مواد التخطيط والاسكان ٤ ساعات وباقي المواد ٣ ساعات.

(ج) يعقد لكل مقرر امتحان تحريري في منتصف الفصل الدراسي لا تقل درجته عن ١٠% من مجموع درجات المقرر باستثناء المقررات التي تحددها اللائحة مثل مشروع التخرج والتدريب الصيفي والندوات والأبحاث.

(د) يعد الطالب راسباً فى المقرر إذا حصل فيه على مجموع درجات أقل من ٥٠% (تقدير **F**)، أو لم يحضر الامتحان التحريري لحرمانه من الدخول، أو لم يحضر الامتحان بدون عذر تقبله الأكاديمية. وفى هذه الحالة له أن يعيده دراسة وامتحانا مرة أو مرات أخرى حتى ينجح فيه.

(ه) يجوز السماح للطالب بإعادة بعض المقررات التي نجح فيها من قبل أو إضافة مقررات جديدة له، بغرض رفع متوسط النقاط ليحقق متطلبات التخرج.

مادة [٣٤] : نسبة الحضور والحرمان من الامتحان والأعذار

(أ) الحد الأدنى لنسبة الحضور للمقرر (لا تقل عن ٧٥%) ليسمح للطالب بدخول الامتحان النهائي للمقرر. وفي حالة حرمانه من الامتحان يعتبر راسباً (يعطى درجة صفر في درجة الامتحان النهائي للمقرر). وفى حالة ثبوت أن التغيب كان بعذر مقبول يمكن عقد امتحان للطالب في هذا المقرر خلال ثلاثة أسابيع من بدء الفصل الدراسي التالي مباشرة، بعد سداد الرسوم المحددة.

(ب) إذا تقدم الطالب بعذر يقبله مجلس الأكاديمية عن عدم حضور الامتحان النهائي لأي مقرر قبل أو بعد يومين من إجراء الامتحان، يحتسب له تقدير "غير مكتمل" في هذا المقرر، بشرط أن يكون ناجحاً في أعمال السنة، وألا يكون قد تم حرمانه من دخول الامتحانات النهائية. وفي هذه الحالة يتاح للطالب الحاصل على تقدير "غير مكتمل" فرصة أداء الامتحان النهائي لهذا المقرر في الموعد الذي يحدده مجلس الأكاديمية.

(ج) يجب على الطلاب متابعة الدروس والاشتراك فى التمرينات العملية وأعمال الورش والتدريب أو قاعات البحث وفقا لأحكام اللائحة الداخلية ولمجلس الأكاديمية الحق فى حرمان الطالب من التقدم للامتحان كله أو فى بعض المواد إذا رأى أن مواظبته غير مرضية طبقا لأحكام اللائحة الداخلية. وفى هذه الحالة يعتبر الطالب راسبا فى المقررات التى حرم من التقدم للامتحان فيها.

مادة [٣٥] : التحويل إلى برامج الساعات المعتمدة

يضع مجلس الأكاديمية ضوابط وشروط التحويل إلى البرامج بنظام الساعات المعتمدة بحيث لا يتم نقل أكثر من ٥٠% من الساعات المعتمدة من إجمالي ما تم دراسته بالنظام الفصلي.

مادة [٣٦] : النظام الكودى للمقررات

يتم تحديد كود المقررات الدراسية طبقا للجدول رقم (٤)

مفتاح الكود $N_1\ N_2$ $N_3 L_1\ L_2\ L_3$ (مثال: MEC101 Mechanics)

جدول رقم (٤)

مفتاح الكود $N_1\ N_2$ $N_3 L_1\ L_2\ L_3$	
١- $L_1\ L_2\ L_3$ ثلاثة حروف ترمز إلى القسم والتخصص المسئول عن تدريس المقرر	
قسم العمارة	ARC
قسم الحاسبات	CMP
قسم الاتصالات	ELC
تخصص الرياضيات قسم العلوم الأساسية	MTH
تخصص الفيزياء قسم العلوم الأساسية	PHY

تخصص الميكانيكا قسم العلوم الأساسية	MEC
تخصص الكيمياء قسم العلوم الأساسية	CHE
قسم هندسة التصنيع	MNF
تخصص المواد الإنسانية وتتبع وكيل الأكاديمية إشرافيا	GEN
٢- N_1 رقم يرمز إلى المستوى التي تدرس به المادة	
$N_1 = 1$	المستوى الأول
$N_1 = 2$	المستوى الثاني
$N_1 = 3$	المستوى الثالث
$N_1 = 4$	المستوى الرابع
$N_1 = 5$	المستوى الخامس
٣- N_2رقم يرمز إلى نوعية المادة التي ينتمي إليها المقرر	
$N_2 = 0$	مادة أساسية أو مادة تحضيرية
$N_2 = 1$	مادة هندسية أساسية
$N_2 = 2$	مادة هندسية تخصصية إجبارية
$N_2 = 3$	مادة هندسية تخصصية اختيارية
$N_2 = 4$	مادة إنسانية إجبارية
$N_2 = 5$	مادة إنسانية اختيارية
$N_2 = 6$	المشروع والندوات والتدريب الصناعي
٤- N_3 رقم يرمز إلى مسلسل المقرر داخل التخصص	