Electronic Engineering and Communication Technology BSc Program Specifications

(By-Law 2018)

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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 الشروع في النشاط والسلوك المرتبط بالعمليات الهندسية والنظم والمشاكل والفرص ، والتاريخ ، والمستقبل ، والتأثيرات ، والأخلاق والمردودات. كما أنها تنطوى على المعرفة، وطرق التفكير والتصرفات والقدرات. كما تساعد في إعداد الأفراد لتقديم خيارات مدروسة في إطار كونهم مستهلكين أوعمالا أومواطنين 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 قوميًا وإقليميًا ودوليًا. 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 لها عن طريق تطبيق مجمل معارفهم وخبراتهم ومهاراتهم .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 والتصميم والتصنيع والبناء. كما تهدف مجمل الأنشطة الهندسية إلى الحصول على نتائج إيجابية لتحسين المعيشة بيد ان هناك عوائق تصاحب هذه الأنشطة مثل 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 والاجتماعية 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 حددت المعايير الأكاديمية المرجعية (ARS)، لبرنامج هندسة الإلكترونيات وتكنولوجيا الاتصالات والمعتمدة من الهيئة القومية للاعتماد وجودة التعليم، الطبعة الأولى يوليو ٢٠١٥، مفاهيم شاملة تمثل التوقعات والطموحات العامة بخصوص معايير درجة البكالوريوس 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،،،

أ.د. شومان الشحات
هندسة الإلكترونيات وتكنولوجيا الاتصالات

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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.Samir Mohamed Kamal.
Assistant Coordinator: Dr.Ibrahim Amin Ibrahim
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.
Total Credit Hours: 180 Hours
Total Contact Hours: 267 Hours
Program Started on: 2018-2019
Dates of program specifications approval: April 2015

1.2. Staff Members

The Electronic Engineering and Communication Technology B.Sc. Program is taught by 23 highly qualified staff members in the Electrical Engineering department, in addition to 26 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 39 full time teaching assistants in addition to 10 engineers and 11 technicians.

1.3. External Evaluator(s)

The program was evaluated internally by DR. Seham Ibrahim, Computer Engineering and Information Technology Department, Modern Academy for Engineering and Technology in Maadi. The program will be also evaluated during this year by an external reviewer. The report of internal 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 63 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 sciences
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 Compulsory Courses of University Requirements (12 credit Hours, 6.67% of total 180 credits).

Course		Hours				Pre-requisite	Subject Area						
Code	Title	Total Credit	Lec	Tut	Lab		**Hum. & Soc. Sc.**	**Math. & B. Sc.**	**B. Eng. Sc.**	**App. Eng. & Des.**	**Comp. App. & ICT**	**Proj. & Practice**	**Discretionary**
GENN 041	Contemporary Social Issues	2	2	-	-	None	2						
GENN 042	English Language.	2	2	-	-	None	2						
GENN 043	History of science and Technology.	2	2	-	-	None	2						
GENN 141	Presentation Skills.	2	2	-	-	None	2						
GENN 142	Technical Report Writing.	2	2	-	-	None	2						
GENN 341a	Project Management.	2	2	-	-	None	2						
Total	**6.67 %**	**12**	**12**	-	-		**12**						

Table 1-b Elective Courses of University Requirements (4 Credits Hours, 2. 22% of total 180 credits).

	Course		Hours				Pre-requisite	Subject Area						
	Code	Title	Total Credit	Lecture	Tutorial	Laboratory		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
Elective 1	GENN351	Engineering Economy.	2	2	-	-	None	2						
	GENN352	Environmental Effects of Electromagnetic Waves.	2	2	-	-								
	GENN353	Engineering Laws and Professional ethics.	2	2	-	-								
	GENN354	Risk Management	2	2	-	-								
Elective 2	GENN451	Advanced Computer Systems Implementation.	2	2	1	-	CMPN010	2						
	GENN452	Civilization and heritage	2	2	-	-	None							
	GENN453	Industrial Psychology.	2	2	-	-								
	GENN454	Marketing	2	2	-	-								
Total		**2. 22 %**	**4**	**4**	**1**	**-**		**4**						

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 Courses of Institute Requirements (Mathematics and Basic science courses) (30credits, 16.66% of total 180 credits)

Course		Hours				Pre-requisite	Subject Area						
Code	Title	Total Credit	Lecture	Tutorial	Laboratory		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
CHEN001	Chemistry.	3	2	1	2	None		3					
MECN001	Mechanics -1.	2	1	3	-	None		2					
MECN002	Mechanics-2.	2	1	3	-	MECN001		2					
MTHN001	Mathematics-1(Algebra and Calculus).	3	2	3	-	None		3					
MTHN002	Mathematics-2(Integration and Analytic Geometry).	3	2	3	-	MTHN001		3					
PHYN001	Physics-1.	3	2	1	2	None		3					
PHYN002	Physics -2.	3	2	1	2	PHYN001		3					
MNFN001	Introduction to Engineering Materials.	1	1	-	-	None			1				
MNFN002	Engineering Graphics.	3	1	6	-	None			3				
MNFN003	Principles of Production Engineering.	3	2	-	3	None			3				
CMPN010	Program Design and Computer Languages.	4	2	3	2	None		4					
Total	**16.66%**	**30**	**18**	**24**	**11**			**23**	**7**				

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 Requirements of the general specialization of the program (Basic Engineering Courses) (67 Credit Hours, 37.22% of total 180 credits)

Course		Hours				Pre-requisite	Subject Area						
Code	Title	Total Credit	Lecture	Tutorial	Laboratory		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MTHN103	Mathematics -3(Differential Equations and Transforms).	3	2	3	-	MTHN002		3					
MTHN104	Mathematics-4(Advanced Calculus).	3	2	3	-	MTHN001		3					
ELCN114	Modern Theory for Semiconductor Devices	3	2	1	2	PHYN002		3					
MTHN207	Mathematics -7 (Introduction to Prob. and Statistics)	3	2	2	-	MTHN002		3					
MTHN208	Mathematics -8 (Complex Analysis and P. D. E).	2	2	1	-	MTHN002		2					
ARCN110	Civil Engineering Technology.	3	2	2	-	None			3				
CMPN110	Data Structures and Algorithms.	3	2	2	-	CMPN010					3		
ELCN111	Electrical Circuit Analysis-1.	3	2	1	2	MTHN002, ELCN060			2			1	
ELCN112	Electrical Circuit Analysis-2.	3	2	3	–	ELCN111			2			1	
ELCN113	Electrical Measurements.	3	2	1	2	ELCN111			2			1	
CMPN111	Logic Circuits Design-1.	4	3	2	1	MTHN001			2		2		
MNFN110	Mechanical Engineering Technology.	3	2	1	2	MECN002 MNFN001			3				
ELCN115	Semiconductors for Microelectronics.	3	2	1	2	ELCN114			3				
CMPN210	Engineering Computer Applications.	3	2	1	2	CMPN010					3		
CMPN211	Numerical Methods with Computer Applications.	3	2	2	-	MTHN103			2		1		
ELCN210	Control-1. (Principles of Automatic Control).	4	3	1	2	MTHN103			3		1		
ELCN211	Signal Analysis.	3	2	2	–	MTHN103			3				
ELCN212	Microelectronic Circuits-1	3	2	1	2	ELCN115, ELCN160			2		1		
ELCN214	Electronic Measurements.	3	2	1	2	ELCN113			3				

ELCN215	Communications-1.	3	2	1	2	ELCN211			3				
ELCN218	Electrical Power Engineering.	3	2	2	1	ELCN112			3				
CMPN310	Microprocessor Based -Systems.	3	2	1	2	CMPN111					3		
Total	**37.22%**	**67**	**46**	**35**	**24**			**14**	**36**		**14**	**3**	

- **ELCN060**: Summer training for level zero.
- **ELCN160**: Summer training for level one.

2.4.4. Applied Engineering and design Courses

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 Applied Engineering and design courses (37 Credit Hours 20.55% of total 180 credits)

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Total Credit	Lecture	Tutorial	Laboratory		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
ELCN213	Microelectronic Circuits-2	3	2	1	2	ELCN212				2	1		
ELCN320	Control-2(Digital and PLC Control)	4	3	1	2	ELCN210				4			
ELCN321	Communications-2.	4	3	1	2	ELCN215				4			
ELCN323	Electromagnetic Field Theory	3	2	3	—	PHYN002				3			
ELCN324	Microwave Engineering	4	3	1	2	ELCN323				4			
ELCN421	Antennas and Wave Propagation.	4	3	1	2	ELCN323				4			
ELCN422	Communications-3 (Information Theory and Coding).	4	3	1	2	MTHN207				2			
ELCN423	Communications-4 (Advanced Communications Systems).	4	3	1	2	ELCN321				4			
ELCN424	Radio and Television Engineering Systems.	4	3	1	2	ELCN211				4			
ELCN425	Digital Signal Processing.	3	2	2	1	MTHN103 CMPN111				2			
Total	**20.55 %**	**37**	**27**	**13**	**17**					**36**	**1**		

Table 4-b Applied Engineering and design Elective Courses (12 Credit Hours+ 3 Credits from Computer Major 8. 33% of total 180 credits)

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Total Credit	Lecture	Tutorial	Laboratory		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Cmp. App. & ICT	Proj. & Practice	Discretionary
ELCN331	Very Large Scale Integrated Systems (VLSI Systems)	3	2	1	2	ELCN213							3
ELCN332	VHDL	3	2	1	2	ELCN213							3
ELCN333	Radar Systems and Remote Sensing	3	2	2	–	ELCN211							3
ELCN334	Advanced Topics in Communications.	3	2	2	–	ELCN321							3
CMPN321	Computer Architecture	3	2	2	-	CMPN111					3		
ELCN431	Optical Fiber Communications.	3	2	1	2	ELCN324							3
ELCN432	Microwave Circuits and Devices	3	2	1	2	ELCN324							3
ELCN433	Communications Networks.	3	2	2	–	ELCN321							3
ELCN434	Mobile Communications.	3	2	2	–	ELCN321							3
ELCN435	Modern Telephone Central Offices.	3	2	1	2	ELCN215							3
ELCN436	Advanced Microwave Measurements	3	2	–	2	ELCN324							3
ELCN437	Satellite Communications	3	2	1	2	ELCN321							3
ELCN438	Acoustics.	3	2	1	2	None							3
ELCN439	Computer Controlled Systems and Applications to Communications.	3	2	3	–	CMPN210 ELCN210							3
Total	**8. 33%**	**15***	**14**	**20**	**16**						3		12

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 Projects and Industrial Training courses (15 Credit Hours, 8.33% of total 180 credits).

Course		Hours				Pre-requisite	Subject Area According to NARS						
Code	Title	Total Credit	Lecture	Tutorial	Laboratory		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
ELCN260	Industrial Traning-1.	3	-	-	-	65 Credits						3	
ELCN261	Seminar	1	-	2	-	65 Credits						1	
ELCN360	Industrial Training-2.	3	-	-	-	ELCN260 + 101 Credits						3	
ELCN361	Project-1.	2	1	1	2	101 Credits + ELCN213						2	
ELCN460	Project-2a.	3	2	-	2	ELCN361						3	
ELCN461	Project-2b.	3	2	-	2	ELCN460						3	
Total	**8. 33%**	**15**	**5**	**3**	**6**							**15**	

The industrial training is carried out in the third and the fourth summers

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			
University Requirements (General cultural courses requirements)	16							**16**	8. 89	**8-10%**
Faculty/Institute requirements (Mathematics & Basic Science Courses)		23	7					**30**	16.66	**15-20%**
Requirements of the general specialization of the program (Basic Engineering Courses)		14	36		14	3		**67**	37. 22	**30-35%**
Requirements of the specific specialization of the program(Applied Engineering and Design)				36	4	15	12	**67**	37. 22	**35-40%**
Total Credit Hours	16	37	43	36	18	18	12	180		
Percentage	8. 88	20.55	23.88	20	10	10	6. 66			
NARS Engineering Requirements	**9-12%**	**20-26%**	**20-23%**	**20-22%**	**9-11%**	**8-10%**	**6-8%**			

Table 5 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 6 thru. 16 shows a sample study plan, where the courses are distributed over ten major semesters.

Table 6 **First Semester (Level zero)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
CHEN001	Chemistry.	3	2	1	2	5
GENN041	Contemporary Social Issues	2	2	-	-	2
MNFN002	Engineering Graphics	3	1	6	-	7
GENN043	History of Engineering and Technology	2	2	-	-	2
MECN001	Mechanics -1.	2	1	3	-	4
MTHN001	Mathematics -1 (Algebra and Calculus)	3	2	3	-	5
PHYN001	Physics -1	3	2	1	2	5
Total		**18**	**12**	**14**	**4**	**30**

Table 7 **Second Semester (Level zero)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
MNFN001	Introduction to Engineering Materials.	1	1	-	-	1
GENN042	English Language.	2	2	-	-	2
MECN002	Mechanics-2	2	1	3	-	4
MTHN002	Mathematics -2(Integration and Analytic Geometry)	3	2	3	-	5
PHYN002	Physics-2.	3	2	1	2	5
MNFN003	Principles of Production Engineering	3	2	-	3	5
CMPN010	Program Design and Computer Languages.	4	2	3	2	7
Total		**18**	**12**	**10**	**7**	**29**

Summer Training

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN060	Summer Training-1	-	-	-	-	-
Total		**-**	**-**	**-**	**-**	**-**

Table 8 **Third Semester (Level one)**

Code	Subject	Total Credit	Contact Hours			
			L	T	P	Total
ARCN110	Civil Engineering Technology.	3	2	2	-	4
ELCN111	Electrical Circuit Analysis-1	3	2	1	2	5
CMPN111	Logic Circuits Design-1.	4	3	2	1	6
ELCN114	Modern Theory for Semiconductor Devices	3	2	1	2	5
MTHN103	Mathematics -3 (Differential Equations and Transforms).	3	2	3	-	5
GENN141	Presentation Skills.	2	2	-	-	2

Total		**18**	**13**	**9**	**5**	**27**

Table 9 **Fourth Semester (Level one):**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
CMPN110	Data Structures and Algorithms.	3	2	2	-	4
ELCN112	Electrical Circuit Analysis-2	3	2	3	-	5
ELCN113	Electrical Measurements.	3	2	1	2	5
MNFN110	Mechanical Engineering Technology.	3	2	1	2	5
MTHN104	Mathematics -4(Advanced Calculus)	3	2	3	-	5
ELCN115	Semiconductors for Microelectronics	3	2	1	2	5
Total		**18**	**12**	**11**	**6**	**29**

Summer Training

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN160	Summer Training-2	-	-	-	-	-
Total		**-**	**-**	**-**	**-**	**-**

Table 10 **Fifth Semester (Level two)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
GENN341	Project Management.	2	2	-	-	2
ELCN210	Control-1 (Principles of Automatic Control).	4	3	1	2	6
ELCN212	Microelectronic Circuits-1	3	2	1	2	5
CMPN210	Engineering Computer Applications	3	2	1	2	5
MTHN207	Mathematics -7 (Introduction to Probability. and Statistics).	3	2	2	-	4
ELCN211	Signal Analysis	3	2	2	-	4
Total		**18**	**13**	**7**	**6**	**26**

Table 11 **Sixth Semester (Level two)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN214	Electronic Measurements	3	2	1	2	5
ELCN218	Electrical Power Engineering.	3	2	2	1	5
ELCN215	Communications -1	3	2	1	2	5
ELCN213	Microelectronic Circuit-2	3	2	1	2	5
MTHN208	Mathematics-8 (Complex Analysis and P. D. E)	2	2	1	-	3
ELCN261	Seminar	1	-	2	-	2
GENN142	Technical Report Writing	2	2	-	-	2

Total		**17**	**12**	**8**	**7**	**27**

Summer Training

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN260	Industrial Training -1	3	-	-	-	-
Total		**3**	**-**	**-**	**-**	**-**

Table 12 **Seventh Semester (Level three)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN321	Communications-2.	4	3	1	2	6
ELCN323	Electromagnetic Field Theory.	3	2	3	-	5
CMPN321	Computer Architecture	3	2	2	-	4
CMPN211	Numerical Methods with Computer Applications.	3	2	2	-	4
CMPN310	Microprocessor Based Systems.	3	2	1	2	5
ELCN361	Project-1	2	1	1	2	4
Total		**18**	**12**	**10**	**6**	**28**

Table 14 **Eighth Semester (Level three)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN320	Control-2 (Digital and PLC Control)	4	3	1	2	6
ELCN324	Microwave Engineering.	4	3	1	2	6
ELCN33*	Elective Course of Applied Engineering and design					
	• ELCN331 Very Large Scale Integrated Systems • ELCN332 VHDL	3	2	1	2	5
ELCN33*	Elective Course of Applied Engineering and design					
	• ELCN333 Radar Systems and Remote Sensing • ELCN334 Advanced Topics in Communications.	3	2	2	-	4
GENN35*	Elective course of University Requirements					
	• GENN351 Engineering Economy • GENN352 Environmental Effects of Electromagnetic Waves. • GENN353 Engineering Laws and Professional ethics • GENN354 Risk Management	2	2	-	-	2

Total		**16**	**12**	**5**	**6**	**23**

Summer Training

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN360	Industrial Training -2	3	-	-	-	-
Total		**3**	**-**	**-**	**-**	**-**

Table 15 **Ninth Semester (Level Four)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN425	Digital Signal Processing.	3	2	2	1	5
ELCN422	Communications-3 (Inf. Theory and Coding)	4	3	1	2	6
ELCN460	Project-2 (First Stage)	3	2	-	2	4
ELCN424	Radio and Television Engineering Systems.	4	3	1	2	6
ELCN43*	Elective Course of Applied Engineering and design					
	• ELCN431 Optical Fiber Communications • ELCN432 Microwave Circuits and Devices	3	2	1	2	5
Total		**17**	**12**	**5**	**9**	**26**

Table 16 **Tenth Semester (Level Four)**

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCN421	Antennas and Wave Propagation.	4	3	1	2	6
ELCN423	Communications-4 (Advanced Communications Systems)	4	3	1	2	6
ELCN461	Project-2 (Second Stage)	3	2	-	2	4
GENN45*	Elective course of University Requirements					
	• GENN451 Advanced Computer Systems Implementation. • GENN452 Civilization and heritage • GENN453 Industrial psychology • GENN454 Marketing	2	2 2 2	1 - -	- - -	3 2 2
ELCN43*	Elective Course of Applied Engineering and design					
	• ELCN433 Communication Networks • ELCN434 Mobile Communications.	3	2	2	-	4

Total		**16**	**12**	**4**	**6**	**22**

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**. December 2018. 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)

Table 17 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**
CHEN 001	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
PHYN 001	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
PHYN 002	Physics (2)	A1, A3, A4, A5, A13, A14, A15, A25	B2, B3, B4, B5, B6, B13, B15	C1, C5, C8, C11, C14	D1, D3, D4,D5, D7
MTHN 001	Mathematics -1 (Algebra and Calculus)	A1, A2, A5	B1, B2, B3, B7	C1, C12	D3, D7
MTHN 002	Mathematics –2 (Integration and Analytic Geometry)	A1, A3, A5	B1, B2, B3, B4, B7, B11	C1, C12	D1, D3, D7
MTHN 103	Mathematics -3 (Differential Equations and Transforms)	A1, A2, A5	B1, B2, B3, B7	C1, C12	D3, D4
MTHN 104	Mathematics-4 (Advanced Calculus)	A1, A5	B1, B2, B3, B7	C1, C13	D3, D4
MTHN 207	Mathematics-7 (Introduction to Probability and Statistics)	A1, A2, A5, A10	B1, B2, B3, B4, B7,B11	C1, C2, C7, C13	D3, D7
MTHN 208	Mathematics-8 (Complex Analysis and Partial Differential Equations)	A1, A3, A5	B1, B2, B3, B4, B7	C1, C12	D1, D3, D7
MECN 001	Mechanics – (1)	A1, A2, A3, A4	B1, B2	C1, C2	D1, D2
MECN 002	Mechanics – (2)	A1, A2, A3, A4, A5	B1, B2, B5, B13, B15	C1, C2, C3	D1, D2
GENN 041	Contemporary Social Issues	A9, A10	B4, B9, B12	C1, C5	D1, D3, D7, D9
GENN042	English language	A9, A10	B4	C11, C12	D1, D2, D3, D4, D6, D7, D8
GENN 043	History of Engineering & Technology	A1, A5, A8, A9, A11, A14	B1, B2, B6, B7		D1,D7, D8
GENN 141	Presentation Skills	A9, A10, A12	B14	C11	D1, D2, D3, D5, D7
GENN 142	Technical Report Writing	A 4, A10, A11	B4	C2, C4, C12, C13	D6, D8
GENN 341a	Project Management	A2, A5, A6, A7	B1, B11		D3 , D6, D7, D9

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
GENN351	Engineering Economy.	A1, A2, A5, A7, A14, A18	B1,B2,B7,B8, B13	C1,C5,C7,C9, C13	D1, D2, D3, D7, D9
GENN352	Environmental Effects of Electromagnetic Waves.	A1, A2, A5, A9, A11	B1, B2, B3, B4	None	D1, D3, D4, D6, D7
GENN353	Engineering Laws and Professional ethics.	A5, A6, A9, A10, A11	B3, B4, B9, B12	C1, C5	D1, D3, D7, D9
GENN354	Risk Management	A1, A2, A4, A5, A6, A11	B1, B2, B3, B4, B7, B9	C1, C2, C6, C11	D1, D2, D3, D5, D6, D7, D9
GENN451	Advanced Computer Systems Implementation.	A4, A6, A8, A10, A12	B8, B9, B11, B13, B14, B15, B18	C5,C6, C10, C13, C14, C15	D1, D3, D4, D7, D9
GENN452	Civilization and heritage	A9, A11, A17	B18,B19, B21	C19, C21,C22	D3, D6, D9
GENN453	Industrial Psychology.	A4، A9 ، A11،A18, A19	B3،B5،B9	C2،C4،C8	D1،D2,D6,D9
GENN454	Marketing	A1, A8, A9	B1, B2	None	D1 , D7, D8
MNFN 001	Introduction to engineering materials	A2, A3, A4, A18	B1, B2, B5, B13,B15,B17	C1, C2, C19	D1, D3, D7, D9
MNFN 002	Engineering Graphics	A2, A4, A5,A 8, A10	B3, B5, B7, B8,B9	C2,C 3, C4, C11, C13	D1,D 3,D 9
MNFN 003	Principles of production Engineering	A1, A2, A4.	B2,B3,B10,B18	C1,C3,C7	D1, D3 ,D7 ,D9
MNFN110	Mechanical Engineering Technology.	A1, A2, A4.	B2, B3, B10, B18	C1, C3, C7.	D1, D3, D7, D9
ARCN 110	Civil Engineering Technology	A7, A14	B9, B16	C1, C2	D3, D8
ELCN 060	Summer training1	A3, A4	B2, B3, B9	C1, C3	D1, D3, D5, D6, D7
ELCN 111	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
ELCN 112	Electrical Circuit Analysis-2	A1, A2, A3, A4, A5	B1, B2, B3, B4, B5, B6, B7	C1, C2	D1, D2, D3, D7, D9
ELCN 113	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
ELCN 114	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
ELCN 115	Semiconductor for Microelectronics	A1, A2, A3, A4, A5	B1, B2, B4, B5, B6, B7, B8, B9, B11, B12	C1, C2,C3, C4, C7, C8, C11, C12	D1, D3, D4, D7, D9
ELCN 160	Summer training2	A14, A15	B1, B5	C2,C3,C6	D1, D3, D5, D6, D7

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
ELCN 210	Control- I	A1,A4,A5,A16	B1,B2,B5,B7,B13	C1,C2,C3,C5, C11,C12,C14,C17	D1,D3,D7,D9
ELCN 211	Signal Analysis	A5, A24	B2, B11	C2,C3,C6	D3, D6, D7, D9.
ELCN 212	Microelectronics Circuits-1	A3, A4 , A8 , A13	B2 , B5 , B7	C3 , C17	D3, D5 , D6 ,D7
ELCN 213	Microelectronics Circuits-2	A1, A3, A4, A15	B2,B3,B5	C1,C7,C15,C18	D2,D3,D6,D7 ,D9
ELCN 214	Electronic Measurements1	A5, A8, A15	B2, B3 ,B12	C3, C12 , C15, C20	D1, D4 ,D6 ,D7
ELCN 215	Communications-1	A2, A15, A18, A19, A24	B2, B15, B17, C19	C12, C14, C15, C18, C20	D3, D6, D7
ELCN 260	Industrial Training -1	A2, A4, A5, A6, A7, A8, A9, A11, A12, A14	B1, B3, B4, B5, B7, B9, B12, B13, B14, B15	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16	D1, D2, D3, D4, D5, D6, D7, D8, D9
ELCN 261	Seminar	A10, A12	B14	C9, C12	D3 , D7, D9
ELCN 320	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
ELCN 321	Communications-2	A15, A18, A24, A27	B4, B14, B15, B18	C15, C19, C20	D3, D6, D7
ELCN 323	Electromagnetic Field Theory	A1, A21	B1, B2	C1, C2	D6
ELCN 324	Microwave Engineering	A20, A21	B15, B16, B18	C17, C20	D6, D9
ELCN 331	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
ELCN 332	VHDL (Advanced Digital Electronic)	A1, A2, A4, A5, A8, A12,A13, A14, A15, A16, A18, A19,A28	B1, B2, B3, B4, B8,B9,B11,B12, B13,B15,B17,B18, B19	C1, C3, C7,C10, C14,C15,C19, C20, C21	D1, D3, D6, D7, D9
ELCN 333	Radar System and Remote Sensing	A1,A2,A4,A18, A20,A21,A24,A28	B2,B4,B5,B15 ,B17	C1, C2	D1,D4,D7,D9
ELCN334	Advanced Topics in Communications	A4, A17	B1, B2, B3, B8, B11	C13	D1, D3, D5, D6, D7
ELCN 360	Industrial Training -2	A2, A4, A5, A6, A7, A8, A9, A11, A12, A14	B1, B3, B4, B5, B7, B9, B12, B13, B14, B15	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16	D1, D2, D3, D4, D5, D6, D7, D8, D9

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
ELCN 361	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
ELCN 421	Antennas and Wave Propagation	A1, A2, A21, A29	B1, B2, B7., B19	C1, C2, C5, C14, C20	D2, D6
ELCN 422	Communications -3	A2, A4, A18, A19, A27	B1, B2, B3, B11, B15, B18	C12, C13, C14	D3, D6, D7
ELCN 423	Communications-4	A18, A26, A27	B2, B5, B15, B18	C15, C18, C19	D3, D6, D7
ELCN 424	Radio and Television Engineering Systems	A18, A24, A27, A26, A29	B5, B15	C15, C17, C19	D3, D6, D7
ELCN 425	Digital Signal Processing	A2, A5, A8, A10, A24	B1, B3, B7, B11, B14, B15	C2, C5, C6, C12, C14, C15	D3, D4, D7
ELCN 431	Optical Fiber Communications	A22, A24, A25	B2, B12, B17	C15, C18	D2, D6, D7
ELCN 432	Microwave Circuit and Devices	A15, A20	B16 ,B17	C15, C17, C20	D7, D9
ELCN 433	Communications Networks	A4, A5, A18, A19, A22, A27, A28	B9, B15, B18	C5, C12, C14	D3, D6, D7
ELCN 434	Mobile communication	A18, A27, A28	B14, B17, B18, B19	C2, C7	D3, D6, D7, D9
ELCN435	Modern Telephone Central Offices.	A15,A20	B16, B17	C15, C17	D7, D9
ELCN436	Advanced Microwave Measurements	A15, A20	B16, B17	C15, C17	D7, D9
ELCN437	Satellite Communications	A1, A18, A19, A21	B2, B5,,B17, B19	C2, C5, C18, C19	D7, D9
ELCN438	Acoustics.	A1, A18, A19, A21	B2, B5,,B17, B19	C2, C5, C18, C19	D1, D6
ELCN439	Computer Controlled Systems and Applications to Communications.	A15, A20	B16, B17	C15, C17	D7, D9
ELCN 460	Project-2a	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
ELCN 461	Project-2b	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
CMPN 010	Program Design and Computer Languages	A1, A2, A4, A5, A8, A13, A15, A16, A18	B1,B2,B3,B4,B7,B 13, B14, B17, B18 , B19,	C1,C2,C3,C4, C5,C6 , C13, C14, C15	D1, D2 ,D3, D4, D5, D7, D9

Course		Program Intended Learning Outcomes			
Code	**Title**	**Knowledge and understanding**	**Intellectual skills**	**Professional and practical skills**	**General and transferable skills**
CMPN 110	Data Structures and Algorithms	A1, A2, A3, A4, A5, A9, A12, A16,A18	B1, B2, B4, B8, B12, B14, B17, B18	D1, D2, D3, D4, D6, D7	D1, D2, D3, D4, D6, D7
CMPN 111	Logic Design-1	A1, A2, A3, A5, A14	B1, B2, B3, B4, B8, B12, B14	C1, C2, C3, C5, C6	D1,D2,D3, D4, D5, D6, D7, D9
CMPN 210	Engineering Computer Applications	A1, A2, A5, A8,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
CMPN 211	Numerical Methods with Computer Applications	A1,A5 A8, A12, A13, A16	B1, B2, B3, B8, B13	C1, C13	D1, D3, D4, D5,D7,D9
CMPN 310	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
CMPN 321	Computer Architecture	A1,A2,A3,A4,A5, A8,A10,A13,A15	B1,B2,B3,B4,B5,B 6,B7,B12,B13,B17	C1,C2,C3,C4,C6,C1 3,C14,C15	D1,D3,D4,D5,D6,D7 ,D9

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
CHEN 001	Chemistry	1		1	1	1	1		1			1	1																	
PHYN 001	Physics (1)	1		1	1									1																
PHYN 002	Physics (2)	1		1	1	1								1	1	1										1				
MTHN 001	Mathematics– 1	1	2			1																								
MECN 002	Mechanics – (2)	1		1		1																								
MTHN 103	Mathematics – 3	1	1			1																								
MTHN 104	Mathematics – 4	1				1																								
MTHN 207	Mathematics – 7	1	1			1					1																			
MTHN 208	Mathematics – 8	1		1		1																								
MECN 001	Mechanics – (1)	1	1	1	1																									
MTHN 002	Mechanics – 2	1	1	1	1	1																								
GENN 041	Contemporary Social Issues									1	1																			
GENN 042	English language									1	1																			
GENN 043	History of Engineering & Technology	1				1			1	1		1			1															
GENN 141	Presentation Skills									1	1		1																	
GENN 142	Technical Report Writing				1						1	1																		
GENN 341a	Project Management		1			1	1	1																						
GENN351	Engineering Economy.	1	1			1		1					1				1													
GENN352	Environmental Effects of Electromagnetic Waves.	1	1			1				1		1																		
GENN353	Engineering Laws and Professional ethics.					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
GENN354	Risk Management	1	1		1	1	1					1																		
GENN451	Advanced Computer Systems Implementation.				1		1		1		1		1																	
GENN452	Civilization and heritage									1		1						1												
GENN453	Industrial Psychology.				1					1		1							1	1										
GENN454	Marketing	1							1	1																				
MNFN 001	Introduction to engineering materials		1	1	1														1											
MNFN 002	Engineering Graphics		1		1	1			1		1																			
MNFN 003	Principles of Prod. Eng.	1	1		1																									
MNFN110	Mechanical Engineering Technology.	1	1		1																									
ARCN 110	Civil Engineering Technology							1							1															
ELCN 060	Summer training1			1	1																									
ELCN 111	Electrical Circuit Analysis-1	1			1	1			1							1														
ELCN 112	Electrical Circuit Analysis-2	1	1	1	1	1																								
ELCN 113	Electrical Measurements	1			1										1	1														
ELCN 114	Modern Theory for Semiconductor Devices	1	1	1	1				1	1																				
ELCN 115	Semiconductor for Microelectronics	1	1	1	1	1																								
ELCN 160	Summer training 2														1	1														
ELCN 210	Control – I	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
ELCN 211	Signal Analysis					1																			1					
ELCN 212	Microelectronics Circuits-1			1	1				1					1																
ELCN 213	Microelectronics Circuits-2	1		1	1											1														
ELCN 214	Electronic Measurements					1			1						1															
ELCN 215	Communications-1					1			1						1															
ELCN 260	Industrial Training -1		1		1	1	1	1	1	1		1	1		1															
ELCN 261	Seminar										1		1																	
ELCN 320	Control –2	1			1	1			1								1													
ELCN 321	Communications-2															1			1						1			1		
ELCN 323	Electromagnetic Field Theory	1																				1								
ELCN 324	Microwave Engineering																				1	1								
ELCN 331	Very Large Scale Integrated Systems					1			1		1		1			1								1						
ELCN 332	VHDL (Advanced Digital Electronic)	1	1		1	1			1				1	1	1	1	1		1	1										1
ELCN 333	Radar System and Remote Sensing	1	1		1														1			1			1				1	
ELCN334	Advanced Topics in Communications				1													1												
ELCN 360	Industrial Training -2		1		1		1	1	1	1	1	1	1		1	1	1	1												
ELCN 361	Project 1	1	1		1				1						1	1														
ELCN 421	Antenna and Wave Propagation	1	1																			1								1
ELCN 422	Communications -3		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
ELCN 423	Communications -4																		1								1	1		
ELCN 424	Radio and Television Engineering Systems																		1						1		1			1
ELCN 425	Digital Signal Processing		1			1			1		1														1					
ELCN 431	Optical Fiber Communications																						1		1	1				
ELCN 432	Microwave Circuit and Devices															1					1									
ELCN 433	Communications Networks				1	1												1	1				1					1	1	
ELCN 434	Mobile communication																	1										1	1	
ELCN435	Modern Telephone Central Offices.														1					1										
ELCN436	Advanced Microwave Measurements														1					1										
ELCN437	Satellite Communication	1																1	1		1									
ELCN438	Acoustics.	1																1	1		1									
ELCN439	Computer Controlled Systems and Applications to Communication														1					1										
ELCN460	Project -2a		1		1		1	1	1	1	1	1	1		1	1	1	1												
ELCN461	Project-2b		1		1		1	1	1	1	1	1	1		1	1	1	1												
CMPN 010	Program Design.& Comp. Language	1	1		1	1			1					1		1	1		1											
CMPN 110	Data Structures and Algorithms	1	1	1	1	1				1			1				1		1											
CMPN 111	Logic Design-1	1		1	1	1									1															
CMPN 210	Engineering Computer Applications	1	1			1			1				1	1			1													
CMPN 211	Numerical Methods with Computer Applications	1				1			1				1	1			1													
CMPN 310	Microprocessor Based-Systems				1					1					1	1	1		1											
CMPN 321	Computer Architecture	1	1	1	1	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	20
CHEN 001	Chemistry	1	1	1	1		1		1		1		1								
PHYN 001	Physics (1)	1	1	1				1										1			1
PHYN 002	Physics (2)		1	1	1	1	1							1		1					
MTHN 001	Mathematics– 1	1	1	1				1													
MECN 002	Mechanics – (2)	1	1	1				1													
MTHN 103	Mathematics – 3	1	1	1				1													
MTHN 104	Mathematics – 4	1	1	1				1													
MTHN 207	Mathematics – 7	1	1	1	1			1				1									
MTHN 208	Mathematics – 8	1	1	1	1			1													
MECN 001	Mechanics – (1)	1	1																		
MTHN 002	Mechanics – 2	1	1			1								1		1					
GENN 041	Contemporary Social Iss.				1					1			1								
GENN 042	English language				1																
GENN 043	History of Engineering & Technology	1	1				1	1													
GENN 141	Presentation Skills														1						
GENN 142	Technical Report Writing				1																
GENN 341a	Project Management	1										1									
GENN351	Engineering Economy.	1	1						1	1					1						
GENN352	Environmental Effects of Electromagnetic Waves.	1	1	1	1																
GENN353	Engineering Laws and Professional ethics.			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	20
GENN354	Risk Management	1	1	1	1			1		1											
GENN451	Advanced Computer Systems Implementation.								1	1		1		1	1	1			1		
GENN452	Civilization and heritage								1	1		1		1	1	1			1		
GENN453	Industrial Psychology.			1		1				1											
GENN454	Marketing	1	1																		
MNFN 001	Introduction to engineering materials		1	1	1														1		
MNFN 002	Engineering Graphics			1		1		1	1	1											
MNFN 003	Principles of Prod. Eng.		1	1							1								1		
MNFN110	Mechanical Engineering Technology.		1	1							1								1		
ARCN 110	Civil Engineering Technology									1							1				
ELCN 060	Summer training1		1	1						1											
ELCN 111	Electrical Circuit Analysis-1	1	1		1	1	1	1													
ELCN 112	Electrical Circuit Analysis-2	1	1	1	1	1															
ELCN 113	Electrical Measurements	1			1										1	1					
ELCN 114	Modern Theory for Semiconductor Devices	1	1	1	1				1	1											
ELCN 115	Semiconductor for Microelectronics	1	1	1	1	1															
ELCN 160	Summer training 2	1				1															
ELCN 210	Control – I	1	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	20
ELCN 211	Signal Analysis		1									1									
ELCN 212	Microelectronics Circuits-1		1			1		1													
ELCN 213	Microelectronics Circuits-2		1	1		1															
ELCN 214	Electronic Measurements		1	1									1								
ELCN 215	Communications-1		1												1		1		1		
ELCN 260	Industrial Training -1	1		1	1	1			1				1	1	1	1					
ELCN 261	Seminar														1						
ELCN 320	Control –2	1	1	1		1		1					1	1							
ELCN 321	Communications- 2				1										1	1			1		
ELCN 323	Electromagnetic Field Theory	1	1																		
ELCN 324	Microwave Engineering															1	1		1		
ELCN 331	Very Large Scale Integrated Systems	1		1						1			1								
ELCN 332	VHDL (Advanced Digital Electronic)	1	1	1	1			1	1		1	1		1		1		1	1	1	
ELCN 333	Radar System and Remote Sensing		1		1	1										1		1			
ELCN334	Advanced Topics in Communications	1	1	1					1			1									
ELCN 360	Industrial Training -2	1		1	1	1		1		1			1	1	1	1					
ELCN 361	Project 1		1	1		1	1													1	
ELCN 421	Antenna and Wave Propagation	1	1					1												1	
ELCN 422	Communications -3	1	1	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	20
ELCN 423	Communications 4		1			1										1			1		
ELCN 424	Radio and Television Engineering Systems					1										1					
ELCN 425	Digital Signal Processing	1		1				1			1				1	1					
ELCN 431	Optical Fiber Communications		2										1					1			
ELCN 432	Microwave Circuit and Devices																1	1			
ELCN 433	Communications Networks									1					1				1		
ELCN 434	Mobile communication														1			1	1	1	
ELCN435	Modern Telephone Central Offices.																1	1			
ELCN436	Advanced Microwave Measurements																1	1			
ELCN437	Satellite Communication		1			1												1		1	
ELCN438	Acoustics.		1			1												1		1	
ELCN439	Computer Controlled Systems and Applications to Communication																1	1			
ELC N 460	Project -2a	1		1	1	1		1	1			1	1	1	1	1					
ELCN 461	Project-2b	1		1	1	1		1	1			1	1	1	1	1					
CMPN 010	Program Design.& Comp. Language.	1	1	1	1			1							1			1	1	1	
CMPN 110	Data Structures and Algorithms	1	1		1				1				1		1		1	1	1		
CMPN 111	Logic Design-1	1	1	1	1				1 1						1						
CMPN 210	Engineering Computer Applications	1	1	1		1		1						1	1			1	1		
CMPN 211	Numerical Methods with Computer Applications	1	1	1					1					1							
CMPN 310	Microprocessor Based-Systems	1	1	1	1	1	1			1		1	1	1			1	1			
CMPN 321	Computer Architecture	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	22
CHEN 001	Chemistry	1	1	1		1			1				1										
PHYN 001	Physics (1)	1					1						1										
PHYN 002	Physics (2)	1				1			1			1			1								
MTHN 001	Mathematics– 1	1											1										
MECN 002	Mechanics – (2)	1											1										
MTHN 103	Mathematics – 3	1											1										
MTHN 104	Mathematics – 4	1												1									
MTHN 207	Mathematics – 7	1	1					1						1									
MTHN 208	Mathematics – 8	1											1										
MECN 001	Mechanics – (1)	1	1																				
MTHN 002	Mechanics – 2	1	1	1																			
GENN 041	Contemporary Social Iss.	1				1																	
GENN 042	English language											1	1										
GENN 043	History of Engineering & Technology																						
GENN 141	Presentation Skills											1											
GENN 142	Technical Report Writing		1		1								1	1									
GENN 341a	Project Management																						
GENN351	Engineering Economy.	1				1		1		1				1									
GENN352	Environmental Effects of Electromagnetic Waves.																						
GENN353	Engineering Laws and Professional ethics.	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	22
GENN354	Risk Management	1	1				1					1											
GENN451	Advanced Computer Systems Implementation.					1	1				1			1	1	1							
GENN452	Civilization and heritage																			1		1	1
GENN453	Industrial Psychology.		1		1				1														
GENN454	Marketing																						
MNFN 001	Introduction to engineering materials	1	1																	1			
MNFN 002	Engineering Graphics		1	1	1							1		1									
MNFN 003	Principles of Prod. Eng.	1		1				1															
MNFN110	Mechanical Engineering Technology.	1		1				1															
ARCN 110	Civil Engineering Technology	1	1																				
ELCN 060	Summer training1	1		1																			
ELCN 111	Electrical Circuit Analysis-1	1		1		1	1			1	1	1											
ELCN 112	Electrical Circuit Analysis-2	1	1																				
ELCN 113	Electrical Measurements		1			1										1	1	1	1		1		
ELCN 114	Modern Theory for Semiconductor Devices	1	1	1	1			1	1				1	1									
ELCN 115	Semiconductor for Microelectronics	1	1	1	1			1	1				1	1									
ELCN 160	Summer training 2		1	1			1																
ELCN 210	Control – I	1	1	1		1						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	22
ELCN 211	Signal Analysis		1	1			1																
ELCN 212	Microelectronics Circuits-1				1													1					
ELCN 213	Microelectronics Circuits-2	1						1								1			1				
ELCN 214	Electronic Measurements			1									1			1				1			
ELCN 215	Communications-1												1		1	1			1		1		
ELCN 260	Industrial Training -1	1	1	1	1	1	1	1	1	1		1			1	1							
ELCN 261	Seminar									1			1										
ELCN 320	Control –2	1	1	1		1	1					1				1	1						
ELCN 321	Communications-2														1				1	1			
ELCN 323	Electromagnetic Field Theory	1	1																				
ELCN 324	Microwave Engineering																	1			1		
ELCN 331	Very Large Scale Integrated Systems	1	1	1		1				1			1			1			1				
ELCN 332	VHDL (Advanced Digital Electronic)	1		1				1				1				1	1			1	1	1	
ELCN 333	Radar System and Remote Sensing	1	1																				
ELCN334	Advanced Topics in Communications													1									
ELCN 360	Industrial Training -2	1	1	1	1	1	1	1	1	1		1				1	1						
ELCN 361	Project 1		1	1									1		1	1			1		1		
ELCN 421	Antenna and Wave Propagation	1	1			1									1						1		
ELCN 422	Communications - 3													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	22
ELCN 423	Communications - 4															1			1	1			
ELCN 424	Radio and Television Engineering Systems															1		1		1			
ELCN 425	Digital Signal Processing		1			1	1						1		1	1							
ELCN 431	Optical Fiber Communications															1			1				
ELCN 432	Microwave Circuit and Devices															1		1			1		
ELCN 433	Communications Networks					1							1		1								
ELCN 434	Mobile communication		2					1															
ELCN435	Modern Telephone Central Offices.														1		1						
ELCN436	Advanced Microwave Measurements														1		1						
ELCN437	Satellite Communication		1			1												1	1				
ELCN438	Acoustics.		1			1												1	1				
ELCN439	Computer Controlled Systems and Applications to Communication														1		1						
ELC N 460	Project -2a	1	1	1	1	1	1	1	1	1		1				1	1	1					
ELCN 461	Project-2b	1	1	1	1	1	1	1	1	1		1				1	1	1					
CMPN 010	Program Design.& Comp. Language.	1			1	1			1					1		1	1		1				
CMPN 110	Data Structures and Algorithms	1	1	1	1	1	1							1	1	1							
CMPN 111	Logic Design-1	1	1	1		1	1																
CMPN 210	Engineering Computer Applications	1	1	1	1	1	1	1							1	1							
CMPN 211	Numerical Methods with Computer Applications	1												1									
CMPN 310	Microprocessor Based-Systems					1	1						1		1	1							
CMPN 321	Computer Architecture	1	1	1	1		1							1	1	1							

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

Code	Subject	General and Transferrable Skills																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CHEN 001	Chemistry	1	1	1	1		1	1												
PHYN 001	Physics (1)	1	1	1	1	1	1	1	1	1										
PHYN 002	Physics (2)	1		1		1		1												
MTHN 001	Mathematics– 1			1				1												
MECN 002	Mechanics – (2)	1		1				1												
MTHN 103	Mathematics – 3	1				1														
MTHN 104	Mathematics – 4			1	1															
MTHN 207	Mathematics – 7			1				1												
MTHN 208	Mathematics – 8	1		1				1												
MECN 001	Mechanics – (1)	1	1																	
MTHN 002	Mechanics – 2	1	1																	
GENN 041	Contemporary Social Iss.	1		1				1		1										
GENN 042	English language	1	1	1	1		1	1	1											
GENN 043	History of Engineering & Technology	1						1	1											
GENN 141	Presentation Skills	1	1	1		1		1												
GENN 142	Technical Report Writing						1		1											
GENN 341a	Project Management			1			1	1		1										
GENN351	Engineering Economy.	1		1				1		1										
GENN352	Environmental Effects of Electromagnetic Waves.	1		1	1		1	1												
GENN353	Engineering Laws and Professional ethics.	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
GENN354	Risk Management	1	1	1		1	1	1		1										
GENN451	Advanced Computer Systems Implementation.	1		1	1			1		1										
GENN452	Civilization and heritage			1			1			1										
GENN453	Industrial Psychology.	1	1				1			1										
GENN454	Marketing	1						1	1											
MNFN 001	Introduction to engineering materials	1		1				1		1										
MNFN 002	Engineering Graphics	1		1						1										
MNFN 003	Principles of Prod. Eng.	1		1				1		1										
MNFN110	Mechanical Engineering Technology.	1		1				1		1										
ARCN 110	Civil Engineering Technology			1					1											
ELCN 060	Summer training1	1		1		1	1	1												
ELCN 111	Electrical Circuit Analysis-1	1	1	1			1	1		1										
ELCN 112	Electrical Circuit Analysis-2	1	1	1				1		1										
ELCN 113	Electrical Measurements	1		1			1		1											
ELCN 114	Modern Theory for Semiconductor Devices	1		1	1			1		1										
ELCN 115	Semiconductor for Microelectronics	1		1	1			1		1										
ELCN 160	Summer training 2	1		1		1	1	1												
ELCN 210	Control – I	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
ELCN 211	Signal Analysis			1			1	1		1										
ELCN 212	Microelectronics Circuits-1			1		1	1	1												
ELCN 213	Microelectronics Circuits-2		1	1			1	1		1										
ELCN 214	Electronic Measurements	1			1		1	1												
ELCN 215	Communications-1			1			1	1												
ELCN 260	Industrial Training - 1	1	1	1	1	1	1	1	1	1	1									
ELCN 261	Seminar			1				1		1										
ELCN 320	Control –2	1		1				1		1										
ELCN 321	Communications-2			1			1	1												
ELCN 323	Electromagnetic Field Theory						1													
ELCN 324	Microwave Engineering						1			1										
ELCN 331	Very Large Scale Integrated Systems			1	1			1												
ELCN 332	VHDL (Advanced Digital Electronic)	1		1			1	1		1										
ELCN 333	Radar System and Remote Sensing	1			1			1		1										
ELCN 360	Industrial Training -2	1	1	1	1	1	1	1	1	1										
ELCN 361	Project 1	1	1	1		1	1	1	1											
ELCN 421	Antenna and Wave Propagation		1				1													
ELCN 422	Communications - 3			1			1	1												
ELCN 423	Communications - 4			1			1	1												
ELCN 424	Radio and Television Engineering Systems			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
ELCN 425	Digital Signal Processing			1	1			1												
ELCN 431	Optical Fiber Communications		1				1	1												
ELCN 432	Microwave Circuit and Devices							1		1										
ELCN 433	Communications Networks			1			1	1												
ELCN 434	Mobile communication			1			1	1		1										
ELCN435	Modern Telephone Central Offices.							1		1										
ELCN436	Advanced Microwave Measurements							1		1										
ELCN437	Satellite Communications							1		1										
ELCN438	Acoustics.	1					1													
ELCN439	Computer Controlled Systems and Applications to Communication							1		1										
ELC N 460	Project -2a	1	1	1	1	1	1	1	1	1										
ELCN 461	Project-2b	1	1	1	1	1	1	1	1	1										
CMPN 010	Program Design.& Comp. Language.	1	1	1	1	1		1		1										
CMPN 110	Data Structures and Algorithms	1	1	1	1		1	1												
CMPN 111	Logic Design-1	1	1	1	1	1	1	1		1										
CMPN 210	Engineering Computer Applications	1		1	1	1		1		1										
CMPN 211	Numerical Methods with Computer Applications	1		1	1	1		1	1	1										
CMPN 310	Microprocessor Based-Systems			1		1		1		1										
CMPN 321	Computer Architecture	1		1	1	1	1	1			1									

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 communications Technology BSc Program are given in Table A2-1, Followed by the courses description.

Table A2-1 Electronics and communications Technology BSc Program Courses

Course Code	Course Title	No. of Credit Hours
CHEN001	Chemistry.	3
PHYN001	Physics-1.	3
PHYN002	Physics -2.	3
MTHN001	Mathematics-1(Algebra and Calculus).	2
MTHN002	Mathematics-2(Integration and Analytic Geometry).	3
MTHN103	Mathematics -3(Differential Equations and Transforms).	3
MTHN104	Mathematics-4(Advanced Calculus).	3
MTHN207	Mathematics-4(Advanced Calculus).	3
MTHN208	Mathematics-4(Advanced Calculus).	3
MECN001	Mechanics -1.	2
MECN002	Mechanics-2.	2
GENN 041	Contemporary Social Issues	2
GENN 042	English language	2
GENN 043	History of Engineering & Technology	2
GENN 141	Presentation Skills	2
GENN 142	Technical Report Writing	2
GENN 341a	Project Management	2
GENN 351	Engineering Economy.	2
GENN 352	Environmental Effects of Electromagnetic Waves.	2
GENN 353	Engineering Laws and Professional ethics.	2
GENN 354	Risk Management	2
GENN 451	Advanced Computer Systems Implementation.	2
GENN 452	Civilization and heritage	2
GENN 453	Industrial Psychology.	2
GENN 454	Marketing	2
MNFN 001	Introduction to Engineering Materials.	1
MNFN 002	Engineering Graphics.	3
MNFN 003	Principles of Production Engineering.	3
MNFN 110	Mechanical Engineering Technology.	3
ARCN 110	Civil Engineering Technology.	3
ELCN 060	Summer training1	3
ELCN 111	Electrical Circuit Analysis-1.	3
ELCN 112	Electrical Circuit Analysis-2.	3
ELCN 113	Electrical Measurements.	3
ELCN 114	Modern Theory for Semiconductor Devices	3
ELCN 115	Semiconductors for Microelectronics.	3
ELCN 160	Summer training2	3
ELCN 210	Control-1. (Principles of Automatic Control).	4
ELCN 211	Signal Analysis.	3

Course Code	Course Title	No. of Credit Hours
ELCN 212	Microelectronic Circuits-1	3
ELCN 213	Microelectronic Circuits-2	3
ELCN 214	Electronic Measurements.	3
ELCN 215	Communications-1.	3
ELCN 260	Industrial Training -1	3
ELCN 261	Seminar	3
ELCN 320	Control-2(Digital and PLC Control)	4
ELCN 321	Communications-2.	4
ELCN 323	Electromagnetic Field Theory	3
ELCN 324	Microwave Engineering	4
ELCN 331	Very Large Scale Integrated Systems (VLSI Systems)	3
ELCN 332	VHDL	3
ELCN 333	Radar Systems and Remote Sensing	3
ELCN 334	Advanced Topics in Communications.	3
ELCN 360	Industrial Training -2	3
ELCN 361	Project 1	3
ELCN 421	Antennas and Wave Propagation.	4
ELCN 422	Communications-3 (Information Theory and Coding).	4
ELCN 423	Communications-4 (Advanced Communications Systems).	4
ELCN 424	Radio and Television Engineering Systems.	4
ELCN 425	Digital Signal Processing.	3
ELCN 431	Optical Fiber Communications.	3
ELCN 432	Microwave Circuits and Devices	3
ELCN 433	Communications Networks.	3
ELCN 434	Mobile Communications.	3
ELCN 435	Modern Telephone Central Offices.	3
ELCN 436	Advanced Microwave Measurements	3
ELCN437	Satellite Communications	3
ELCN 438	Acoustics.	3
ELCN 439	Computer Controlled Systems and Applications to Communications.	3
ELCN 460	Project-2a	3
ELCN 461	Project-2b	3
CMPN 010	Program Design and Computer Languages.	4
CMPN 110	Data Structures and Algorithms.	3
CMPN 111	Logic Circuits Design-1.	4
CMPN 210	Engineering Computer Applications.	3
CMPN 211	Numerical Methods with Computer Applications.	3
CMPN 310	Microprocessor Based -Systems.	3
CMPN 321	Computer Architecture	3

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Course Specification
CHEN001: Chemistry

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: June, 2018

B - Basic information

Title: Chemistry **Code:** CHEN001 **Level:** Freshman. **Semester**: First/Second
Hours Credit 3 hrs **Lectures** 2 hrs **Tutorial** 1 hrs **Practical** 2 hr
Pre-requisite: non

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 and theory of chemical Engineering subjects such as: gas laws, gas liquidation, Electro chemistry and its applications, thermo chemistry and its applications, solutions and antifreezes to understand some of chemical industries in different fields Such as polymers, lubricants, Soaps and detergents, petrochemicals, cement Industry, water treatments and Desalination.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion 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 system with a better quality. (B1,B3.B4,B12,B10)
b5-Think in a creative new scientific idea 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 undergrawnd 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

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Gas law and gas liquefaction.	4	2	-
Liquid state, Refrigeration & heat pump.	4	1	-
Electrochemistry &Metallic corrosion.	2	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	-	-	8
Revision and sheets	2	2	6
Total hours	**28**	**14**	**28**

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	
	a2	1			1					1		1	1	1
	a3	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
Intellectual	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			
	b5	**1**											**1**	**1**
	b6	**1**				**1**				1			**1**	
	b7	**1**		**1**				**1**		1				**1**
	b8	**1**	**1**			**1**								
Applied	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	1
	c5	1	1				1			1	1			
	c6	1		1			1				1	1		
	c7	1			1	1								1
	c8	1	1	1	1		1							
	c9	1				1								1
	c10	1					1				1			
General	d1			1		1		1					1	
	d2		1	1			1	1	1				1	
	d3	1	1		1	1		1					1	1
	d4	1	1	1				1						

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments and reports	Bi-Weekly	10
Quizzes	5^{th} and 10^{th}	10
Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes

Goda, S. and Assran, A. Chemistry for engineering & applied sciences, Lecture note, 2012.

6-2 Required books:

Sunita Rattan (2013**),** A Textbook of Engineering **Chemistry, Kaston Books, New Delhi**

6-3 Recommended books:

None

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 Shaaban Ragab Goda
Head of the Department: Prof. Dr. Ashraf Taha
Date: September 2019

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Course Specification

PHYN001 : Physics I

A- Affiliation

Relevant program/s:	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:	June, 2018

B - Basic Information

Title: Physics I **Code:** PHYN001 **Level:** Freshman, First Semester
Credit Hours: 3 **Pre-requisite:** None
Contact Hours: **Lectures:** 2 **Tutorial:**1 **Laboratory: 2** **Total:** 5

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, A2, A3, A4, A13
B	Professional and practical skills	B1, B2, B3, B7, B17, B20
C	Intellectual 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	1	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	2
➢ Mathematical representation of waves and speed of transverse waves.	1		2
➢ The principle of superposition.	1		
➢ Standing waves and Sound waves.	1	1	4
Total hours	**28**	**14**	**28**

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			
		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)
Quizzes assignments and reports	3rd and 10th weeks	20
Mid-Term Exam	7th week	20
Practical Exam	15th week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

- PHYN001, Physics I.
- Physics Lab (1) Note.

6-2 Required books

Serway (2003) Physics for Scientists & Engineering, USA: Sundress College Pub.

Griffith Thomas (2008) The Physics of Everyday Phenomena, USA: Mc-Graw hill.

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

http.www.saunderscollege.cpm/physics
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 and Data Show
3. Laboratories.

Course coordinator: Dr. Mohamed Eltawab
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification

PHYN002: Physics II

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: June, 2018

B - Basic information

Title: Physics-2 **Code:** PHYN002 **Level:**Senior2, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: PHYN001

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 the electricity and magnetism and 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 and A3) .
a2- Gausses law in electricity for different type of charged bodies (A1 and A3).
a3- Laws of electric capacitors and effect of dielectric (A4 and A5).
a4- Direct current, resistance and solution of simple electric circuits and kerchief's laws (A4 , A5, A13, A14, and A15)
a5- Analogy between magnetic field and electric field., and application of Ampere's law, Gausse's law in magnetism (A3, A4, A14 and A15) .
a6- Magnetic properties of matter (A3, A5, A13, and A15).
a7- Fundamental theories of Electro-magnetic waves and main physical phenomena of physical optics (interference, diffraction and polarization) (A25) .

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, and B13).
b2-Study of capacitors' and dielectric effect, uses of capacitors, and use Kirchhoff's laws to solve simple electric circuits (B3, B5, B6, and B15).
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, B5, and B15).

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, C8, and C11).
c2- Determine time constant for (Rc) circuits (C1, C5, and C11).
c3- Determine power, focal length for lenses and mirrors (convex and concave) (C1, C5, and C11).
c4- Perform a physical experiment (Absorption co-efficient, polarization and Newton's rings) (C1,C5, C11, andC14).

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 (D1)
d3- Use the E-mail and internet (D3, D4, and D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4, A5, A13, A14, A15, A25
B	Intellectual skills	B2, B3, B4, B5, B6, B13, B15
C	Professional and practical skills	C1, C5, C8, C11, C14
D	General and transferable skills	D1, D3, D4,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		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	1	1	2
➢ Diffraction of light, Some applications	1	1	2
Total hours	**28**	**14**	**28**

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			
	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 Skills	b1	1			1	1										1		1	1	1			
	b2	1			1	1										1		1	1	1			
	b3	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			
	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			
	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	8-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

M. El- Tawab Kamal and Abo- Elyzeed B. Abo- Elyzeed, ***Electricity, Magnetism and Optics Physics***

6-3 Recommended books:

- David Halliday, Robert Resnick, JearlWallker, ***Fundamentals of Physics***, John Wiley, New York, 1993.
- Raymond A. Serway, ***Physics for Scientists and Engineers with Modern Physics***, 3rd ed. Wiely, New Yourk, 1990.

6-4 Periodicals, Web sites, etc.

Non

7- Facilities required for teaching and learning:

- Physics Lab.
- Computer, and Data show

Course coordinator:	Dr. M El- Tawab Kamal
Head of the Department:	Prof. Dr. Ashraf Taha
Date:	September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
MTHN 001: 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: 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: June, 2018

B - Basic information

Title: Mathematics-1 **Code:** MTHN001 **Level:** First **Semester:** First
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 3 **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, C12)

c2- Use matrices and vectors to solve engineering problems. (C1, C12)

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, A2, A5
B	Professional and practical skills	B1, B2, B3, B7
C	Intellectual skills	C1, C12
D	General and transferable skills	D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Functions	3	4	
➢ Differentiation	3	6	
➢ Trigonometric and inverse trigonometric functions	4	6	
➢ Exponential and logarithmic functions	2	4	
➢ Hyperbolic and inverse hyperbolic functions	2	4	
➢ Taylor and binomial expansions	2	3	
➢ Matrices with applications	6	6	
➢ Vectors in the Euclidean space	2	3	
➢ Real vector spaces	2	3	
➢ Polar coordinates	2	3	
Total hours	28	42	

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)
Assignments, Reports	Bi-weekly	20
Two Quizzes	5th and 9th	20
Mid-Term Exam	7th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

Sameh Shenawy and Sabry Abd El-Aziz Algebra and Calculus, Lecture Notes, Modern Academy Press.

6-2 Required books

Briggs (2013) Calculus for Scientists and Engineers, U.S.A: Pearson.

Stewart, J. (2012) Calculus, U.S.A: Cengage Learning.

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. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification

MTHN 002: 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:	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:	June, 2018

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 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, 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. 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	Professional and practical skills	B1, B2, B3, B4, B7, B11
C	Intellectual skills	C1, C12
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 thearem of calculus	2	3
3	Methods of integration (integration by parts, substitution)	4	6
4	Integration of trigonometric functions	2	4
5	Trignometric 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)	2	3
	Total hours	**28**	**42**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessement Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving						Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizes	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	40
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
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

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. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
MTHN103: Mathematics -3 (Differential Equations and Transforms)

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:	Basic Scienc Department
Date of specifications approval:	June, 2018

B - Basic information

Title: Differential Equations and Transforms **Code:** MTHN103 **Level:** 1st (Sophomore) **Semester:** Third

Hours **Credit/Total** 3hrs **Lectures** 2hrs **Tutorial** 3hrs **Practical** —

Pre-requisite: MTHN002

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the basic concepts of the ordinary differential equations (O.D.E) and understanding a lot of methods to solve the different types of O.D.E. Furthermore, they should be able to study in this course 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- solving 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, C12)
c2- apply Laplace transform in electrical and mechanical problem. (C1, C12)
c3- apply Fourier series in electrical and mechanical problem. (C1, C12)

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- communicate effectively. (D3)
d2- search for information. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A5
B	Professional and practical skills	B1, B2, B3, B7
C	Intellectual skills	C1, C12
D	General and transferable skills	D3, D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Definitions, order, degree.	1	1	—
➢ 1st order differential equations, 2nd order and n th 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.	4	5	—
Total hours	**28**	**42**	—

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			
	c2	1	1			1			
	c3	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	40
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

Essawi, A. M. and El-Sayed, A. T. (2013) Differential Equations and Transforms. Cairo: MAM Press

6-2 Required books

Kreyszig, E. (1980) Advanced Engineering Mathematics. John Wiley, New York.

6-3 Recommended books:

Wylie, C. R. and Barrett, L. C. (1996) Advanced Engineering Mathematics. McGraw-Hill.

6-4 Periodicals, Web sites, etc.

www.mathwords.com.
www.khanacademy.org/math/differential-equations
www.sosmath.com/diffeq/diffeq.html

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Prof.Dr. Ashraf Taha EL-Sayed
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
MTHN104: Mathematics -4 (Advanced Calculus)

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: June, 2018

B - Basic information

Title: Advanced Calculus
Code: MTHN104 **Level:** 1st (Sophomore) **Semister:** Fourth
Hours **Credit/Total** 3hrs **Lectures** 2hrs **Tutorial** 3hrs **Practical** —
Pre-requisite: MTHN001

C - Professional information

1 – Course Learning Objectives:

A study of this course aims to realize the basic concepts in functions of two or more independent variables and its partial derivative with applications and to realize the basic concepts of double and trible 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- applications of partial derivatives to physical and Engineering problems.(A1,A5)
a2- rule of doule integral.(A1,A5)
a3- rule of trible 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, C12)

c2- apply vector analysis to find the work done by the force field in electrical problem. (C1, C12)

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- communicate effectively. (D3)
d2- search for information. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5
B	Professional and practical skills	B1, B2, B3, B7
C	Intellectual skills	C1, C12
D	General and transferable skills	D3, D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Functions of several variables ; partial derivatives,. Directional derivatives, Taylor polynomials, Lagrange multiplier max, and min. of functions			
• 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	—
➢ Multiple integrals (double, triple integrals)			
• Double integrals	4	6	—
• Triple integrals	4	6	—
➢ Polar coordinates, cylindrical coordinates and spherical coordinates			
• Polar coordinates, cylindrical coordinates	2	3	—
• spherical coordinates	2	3	—
➢ Green's theorem, Gauss's and Stocks theorems.			
• Vector Calculus	3	6	—
• Green's theorem, Gauss's and Stocks theorems.	1	1	—
Total hours	**28**	**42**	—

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	Quizes	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			
	c2	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	40
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

Essawi, A. M., Wafaee, M. and El-Sayed, A. T. (2013) Advanced Calculus. Cairo: MAM Press

6-2 Required books

Wylie, C. R. and Barrett, L. C. (1996) Advanced Engineering Mathematics. McGraw-Hill.

6-3 Recommended books:

Kreyszig, E. (1980) Advanced Engineering Mathematics. John Wiley, New York.

6-4 Periodicals, Web sites, etc.

www.mathwords.com.
www.khanacademy.org/math
www.sosmath.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Prof.Dr. Ashraf Taha EL-Sayed
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
MTHN207: Mathematics-7 (Introduction to Probability and Statistics)

A- Affiliation

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

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

Department Date offering the course: Basic Sciences Department

of specifications approval: June, 2018

B - Basic information

Title: Mathematics-7(Probability and statistics) **Code:** MTH 207 **Level:** Junior **Semester**: 5th
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 2 **Practical:** -
Pre-requisite: MTHN002

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 functions, set theory, random events, probability functions, mathematical expectation, conditional probability, Binomial distribution, normal distribution, Sampling and the central limit theorem, Estimation, hypothesis testing, regression and correlation and Chi-square analysis and analysis of variance.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- main rules and notions of functions and set theory. (A1, A2, A10)
a2- basics and different rules of probability theory. (A1, A2, A10)
a3- discrete and continuous probability distributions and rules of their expectation and their standard deviation (A1, A2, A10).
a4- notions of descriptive statistics, probability concepts, binomial and normal distributions, as well as the notions of conditional probability and counting techniques. (A1, A5, A10)
a5- principles of sampling and the central limit theorem, estimation, regression and. (A1, A2, A5, A10)
a6- basic concepts of statistics, measures of location and measures dispersion. (A1, A2)

b - Intellectual skills:

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

b1- describe discrete data graphically and compute measures of centrality and dispersion. (B1, B2)

b2- compute probabilities by applying different probability rules and theorems of probability. (B1, B2, B4, B7)

b3- construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance. (B1, B2, B7)

b4- apply basic concepts of probability functions, Mathematical expectation, variables, discrete distribution, binomial distribution, continuous distribution, and normal distribution to applications. (B1, B2)

b5- evaluate and analyze basic concepts of statistics, sampling, the central limit theorem, estimation, correlation and regression. (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, C2, C7, 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, A2, A5, A10
B	Intellectual skills	B1, B2, B3, B4, B7,B11
C	Professional and practical skills	C1, C2, C7, C13
D	General and transferable skills	D3, D7

3 – Contents

	Topic	Lecture hours	Tutorial hours	Practical hours
1	Functions, curve equation relationship.	4	4	
2	Set theory, Random events, and probability functions.	4	4	
3	Mathematical expectation, conditional probability.	4	4	
4	Binomial distribution, normal distribution.	4	4	
5	Sampling and the central limit theorem.	4	4	
6	Estimation, hypothesis testing.	2	2	
7	Regression and correlation.	4	4	
8	Chi-square analysis and analysis of variance.	2	2	
Total hours		**28**	**28**	

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	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: assignments, participation and home exams	Bi-Weekly	20
Two quizzes.	5^{th} and 10^{th} weeks	20
Mid-Term Exam	8-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

Sameh Shenawy, **Introduction to Probability and Statistics**, Lecture Notes, Modern Academy, Egypt, 2019.

6-2 Required books

Douglas C. Montgomery and George C. Runger, Applied Statistics and Probability for Engineers, 6th ed., John Willey & Sons, Inc., 2014

R.E. Walpole, R.H. *Myers* and S.L. *Meyers*, *Probability and Statistics* for Engineers and Scientists, sixth edition. *Prentice-Hall 1998*

6-3 Recommended books:

John Neter, G.A. Whitmore, William Wasserman, Applied Statistics, Fourth Edition, Needham Heights, MA: A *Division of Simon* & *Schuster*, Inc.,1993.

6-4 Periodicals, Web sites, etc.

www.mathworlds.com.

www.sosmath.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Associate Prof. Sameh Shenawy
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
MTHN208: Mathematics-8 (Complex Analysis and Partial Differential Equations)

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: June, 2018

B - Basic information

Title: Mathematics-6 **Code:** MTHN208 **Level:** Junior **Semester**: 6 th
Credit Hours: 2 **Lectures:**2 **Tutorial:**1 **Practical:** --
Pre-requisite: MTHN002

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, 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.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
C	Professional and practical skills	C1, C12
D	General and transferable skills	D1, D3, D7

	Topic	Lecture hours	Tutorial hours
1	Complex numbers, arithmetic operations, polar forms	2	1
2	D'Moiver theorem, complex functions. Analytic function	2	1
3	Elementary functions of complex variables	2	1
4	Mapping, and conformal mapping.	2	1
5	Bilinear transformation, complex integrals.	2	1
6	Power series (Taylor and Laurent series).	2	1
7	Integration by method of residues.	2	1
8	Introduction to PDEs, Basic concepts of PDEs	3	1
9	Classifications and conical forms of 2nd order linear PDEs.	3	1
10	Method of separation of variables for heat equation.	3	2
11	Wave and Laplace equations. D'Alembert solution of wave equation.	3	2
12	Solution of PDEs using Laplace transforms.	2	1
	Total hours	**28**	**14**

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	Quizes	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)
assignments, term papers	Weekly	20
Two Quizzes,	5th and 10th	20
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

Moamen Wafaae and Ashraf Taha , Complex Analysis and partial Differential Equations,

Lecture Notes, Modern Academy, 2013.

6-2 Required books

E. Kreyszig, Advanced Engineering Mathematics, 10th ed, John Willey & Sons, Inc., 2001

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

Course coordinator: Dr. Ghada Salem
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
MECN 001: 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: 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: June, 2018

B - Basic information

Title: Mechanics-1 **Code:** MECN 001 **Level:** Senior 2. Semester: Frist.

Hours	Credit/Total	2 hrs	Lectures	2 hrs	Tutorial	3 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 unkownes(C1,C2).
c2- solve the trusses to get the value of the forces in the structural by joints and by section methods(C1,C2).

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, A2, A3, A4
B	Professional and practical skills	B1, B2
C	Intellectual skills	C1, C2
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)	1	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 Trussess by the method of joints	1	4
➢ Analysis of Trussess by the method of section ➢	1	4
➢ Final revision	1	1
Total hours	**14**	**42**

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			2	1						1				1		1	1	1			
	a2	1			2	3										1		1	1	1			
	a3	1			3	3						1				1		1	1	2			
	a4	2			4	1						1				1		1	1	1			
Intellectual	b1	**2**			**4**											1		1		**1**			
	b2	**2**			**4**	**1**										1		1	**1**	**1**			
Applied	c1	2			4	3										1		1	1	1			
	c2	2			4											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	7-th Week	20
Second Mid-Term Exam	12-th Week	20
Written Exam	Fifteen week	40
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, engineering mechanics statics and dynamics, statics and dynamics hibbeler 12th edition.

Course coordinator:	Dr Moamen Wafaie
Head of the Department:	Prof. Dr. Ashraf Taha
Date:	September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
MECN 002: 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: 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 SciencDepartment

Date of specifications approval: June, 2018

B - Basic information

Title: Mechanics-2 **Code:** MECN 002 **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- defention 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,C3)
c2- calculate the time of flight of projectile to get a target. (C1, C5).
c3- solve the equation of motion graphically.(C3)

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, A2, A3, A4, A5
B	Professional and practical skills	B1, B2, B5, B13, B15
C	Intellectual skills	C1, C2, C3
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
➢ Normal and Tangention.	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 centeral force.	1	4
➢ Principle of Impulse and Momentum for particle.	1	2
Total hours	**14**	**42**

4 – Teaching, Learning and Assessementmethods:

Course ILO's	Teaching Methods	Learning Methods	Assessement Method

		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizes	Term papers	Assignments			
Knowledge	a1	1			1	1						1				1		1	1	1			
	a2	1			1	3										1		1	1	1			
	a3	2			2	3						1				1		1	1	2			
	a4	1			1	1						1				1		1	1	1			
	a5	2			2											1		1	1	1			
Intellectual	b1	**2**			**2**											1		1		**1**			
	b2	**1**			**1**	**1**										1		1	**1**	**1**			
Applied	c1	1			1	3										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:

Asessement Method	Timing	Grade (Degrees)
Semister Work: seminars, assignments and reports	Bi-Weekly	20
Quizes	5th and 10th	20
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
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: Non

6-4 Periodicals, Web sites, etc.

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

Course coordinator:	Dr Shimaa Lotfy
Head of the Department:	Prof. Dr. Ashraf Taha
Date:	September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN041: 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 Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic scinec department
Date of specifications approval:	June 2018

B - Basic information

Title Contemporary Social Issues: **Code:** GENN041 **Level:** Freshman, **Semester**: First

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).	4	-	-
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	**28**	**-**	**-**

4 - Teaching and Learning and Assessement methods:

Course ILO's	Teaching Methods										Learning Methods				Assessement Method							
	Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizes	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							
Professional	c1	**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:

Asessement Method	Timing	Grade (Degrees)
Assignments	Bi-Weekly	20
Quizes	5th and 10th	20
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes :

Shimaa Esmail, Contemporary Social Issues, Lecture note, Modern Academy Press, 2014.

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6-2 Required books

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

6-3 Recommended books:

None

6-4 Periodicals, Web sites, etc.:

7- Facilities required for teaching and learning:

- Computer,
- Data show
- Computer programs

Course coordinator: Dr. Shimaa Nabih Ebrahim Esmail

Head of the Department: Prof. Dr. Ashraf Taha

Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN042: 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 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: June, 2018

B - Basic information

Title: English Language **Code:** GENN042 **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	Professional and practical skills	B4
C	Intellectual 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 **Reading :**	2		

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		
Total hours	**28**		

4 - Teaching and Learning and Assessementmethods:

Course ILO's		Teaching Methods										Learning Methods				Assessement Method							
		Lecture	Warming up	Discussions	Tutorials	Problem solving						Researches and Reports	Modeling and Simulation			Written Exam	Class work	Quizes	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			
al Tran.	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:

Asessement Method	Timing	Grade (Degrees)
Assignments and Reports	Bi-Weekly	20
Two Quizzes	5th and 10th	20
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
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. Dr. Ashraf Taha

Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN043: History of Engineering & Technology

A- Affiliation

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

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

Department offering the course: Basic Science Department
Date of specifications approval: September, 2018

B - Basic information

Title: History of Science and Technology **Code:** GENN 043 **Level:**1 Semester: First, Second, Third.

Hours Credit/Total 2 hrs Lectures 2 hrs Tutorial - Practical -

C – Professional information

مع نهاية تدريس هذا المقرر يكون الطالب قد اكتسب المهارات التى تمكنه من فهم تاريخ الهندسه و التكنولوجيا فى مختلف العصور والفرق بين كل من العلم و الهندسة والتكنولوجيا – نقل التكنولوجيا – نشاطات العمل الهندسى و مسئوليات المهندس- امثلة على تطور اوجه النشاط الهندسى و التكنولوجى و أشهر علماء الهندسة 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 الهندسة والتكنولوجيا و علاقتهم ببعضهم البعض و كيفية ابتكار معدات و منظومات تحقق احتياجات المجتمع طبقا لتلك المفاهيم (A1, A11, A14)

a2- المعلومات التاريخية عن مهنه الهندسة و التكنولوجيا وكذا العلاقة بين مسمى المعهد او الكلية و بين ما يتم دراسته.(A9,A1)

a3- مفهوم التعليم الهندسى و مجالات العمل للمهندسين و كيفيه القيد و التسجيل بنقابة المهندسين و كذا حقوق وواجبات المهندس(A9, A1)

a4- تطور اوجه النشاط الهندسى و التكنولوجى و ايضا التعرف على الطرق المختلفة لنقل التكنولوجيا (A8,A5)

b - Intellectual skills:

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

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

b2- أن يستحدم الطالب المنهج العلمى فى التفكير وصولا لتصميم و تركيب الفروض (B2)

b3- أن يستطيع الطالب التفكير فى حل مشكلة ما من خلال تفهمه لموضوعات الهندسة العكسية (B7)

B4- ان يستطيع الطالب اتخاذ القرار السليم و اختيار انسب الحلول من خلال دراسته لنماذج و امثلة من المشاكل

الهندسيه و عرض الحلول الممكنه لها (B6)

d - General and transferable skills:

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

d1- المام الطالب بمعايير الجودة و نظم الامان فى استخدام المنظومات الهندسية.(D1)

d2- تدريب الطالب على التفكير و ايجاد التصميمات اللازمة لخلق كل ما هو جديد.(D7,D8)

d3- اكساب الطالب الخبرة فى ايجاد حلول عملية تخدم برامج خارج تخصصه (D7).

d4-اكساب الطالب كيفية وضع المعايير اللازمة لتكوين فريق بحثى متكامل(D1)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5, A8, A9, A11,A14
B	Professional and practical skills	B1, B2, B6, B7
D	General and transferable skills	D1, D7, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
العلم و الهندسة والتكنولوجيا	2		
الهندسة و البحث العلمى – منظومة البحث العلمى	2		
عناصر و متطلبات البحث العلمى	2		
الهندسة وخريطة البحث العلمى – مراحل البحث العلمى	2		
تاريخ الهندسة و التكنولوجيا فى مختلف العصور	4		
نقل التكنولوجيا	2		
نشاطات العمل الهندسى و مسئوليات المهندس	2		
التعليم الهندسى	2		
نقابة المهندسين المصرية – جمعية المهندسين المصرية	4		
تطور اوجه النشاط الهندسى و التكنولوجى	4		
اشهر علماء الهندسة و التكنولوجيا	2		
Total hours	**28**		

4 – Teaching, Learning and Assessementmethods:

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
	a2	1	1	1				1				1	1	1
	a3	1	1					1				1	1	1
	a4	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**
	b4	1	1					1					1	
General	d1		1	1				1					1	
	d2		1	1				1					1	
	d3		1	1				1					1	
	d4		1	1				1					1	

5- Assessment Timing and Grading:

Asesement Method	Timing	Grade (Degrees)
Semister Work: seminars, quizes assignments and reports	Bi-Weekly	40
Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	-
Written Exam	Sixteenth week	40
Total		100

6- List of references: تاريخ العلوم و التكنولوجيا الهندسية المؤلف احمد على العريان الناشر عالم الكتب رقم 8-090-232-997 تسلسلى عالمى

6-1 Course notes: -

6-2 Required books:

Robert J. Pond, Jeffrey L. Rankinen (2014) Introduction to Engineering Technology, Prentice Hall, USA.

6-3 Recommended books

Wright, P. H., Introduction to engineering, second edition, John Wiley and Sons Inc., New York, 1994

6-4 Periodicals, Web sites, etc.

مواقع الانترنت الخاصة بنقابه المهندسين المصرية

7- Facilities required for teaching and learning:

- Computer, Data show and projector.

Course coordinator: Dr Marwa Mohamed Fouad
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN 141: Presentation Skills

A- Affiliation

Relevant program/s: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology B.Sc. Program
Architecture Engineering and Building Technology BSc Program

Department offering the program: Electronic Engineering and Communication Technology Department

Department offering the course: Basic Sciences Department.

Date of specifications approval: October 2018

B - Basic Information

Title: Presentation Skills **Code:** GENN141 **Level:** Sophomore ,Third

Credit Hours: 2 **Pre-requisite:** None

Contact Hours: **Lectures:** 2 **Tutorial: :** - **Laboratory: :-** **Total:** 2

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 - Professional and practical 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

Topic	Lecture hours	Tutorial hours	Practical hours
• Preparation of short talks.	2		
• How to write a technical report.	2		
• C.V Writing: Preparation of an attractive C.V. containing personal data qualifications, posts, and publications. - Interview Preparations	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.	4		
• To improve the student communications skills / Seminar training / Joharry's window	6		
• To develop the student acquiring power of leadership	2		
• Training on active listening and negotiation.	4		
• To understand and practice what's body language.	2		
• Free Suggested topic by the students.	2		
• Speeches vs. presentation	2		
Total hours	**28**		

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 & Reports		Midterm	Quizzes	Assignments	Written Exam	Practical Exam			
Knowledge & Understanding	a1	1	1																1				
	a2	1												1				1					
	a3		1	1																			

Intellectual Skills	b1	1	1	1								1	1	1				1	1				
Applied Prof. Skills	c1	1											1	1			1	1					
General Skills	d1		1	1								1		1									
	d2		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)
Mid-Term Exam		7-th Week	20
Semester Work	Presentation	Weekly (every week different no. of students to present)	20
	CV	Weekly (every week different no. of students to present)	13
	Company's biography	Weekly (every week different no. of students to present)	7
Practical Exam		Fifteenth week	-
Written Exam		Sixteenth week	40
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:

- Strunck, William, Jr.; and white, E. B., The Elements of style, 3rd edition", MacMillan Co., 2000
- Gerson Sharon J. and Gerson Steven M., Technical Communication Process and Product, 7th edition, Prentice Hall, 2012.
- Riordan Daniel G. Technical Report Writing Today, 9th edition", Houghton Mifflin, 2005.
- Stephen Lucas, The Art of Public Speaking, 9th edition, McGraw Hill. 2007.
- 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. Shouman S.E.I.
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN142: Technical Report Writing

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:	June, 2018

B - Basic information

Title: Technical Report Writing **Code:** GENN142 **Level:** junior, First Semester
Credit Hours: 2 **Lectures:** 2 **Tutorial/Exercise:** **Practical: -**
Pre-requisite: None

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]
c2- Interact professionally with other writers and their writing. [C4]
c3- communicate effectively his knowledge and scientific findings with other people. [C12], [C14]
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, C4, C12, C13
D	General and transferable skills	D6, D8

3 – Contents

	Lecture hours	Tutorial hours	Practical hours
• Introduction: Paper Presentation	2		-
• Steps to a Successful Writing Assignment	2		-
• The Writing Process	2		-
• Mechanics	4		-
• Research Papers and Reports	2		-
• Technical Report Writing	4		-
• Resumes and Cover Letters	2		-
• Using Words Correctly	2		-
• Report and Thesis Layout	2		-
• Technical Writing Ethics	2		-
• A Structured Approach to Presenting Postgraduate Research Theses	2		-
• Publishing from the thesis	2		-
• Writing a research paper (Isn't it a bit early)	2		-
Total Hours	**28**		-

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		1	1	1			
	c2	1			1											1		1	1	1			
	c3	1		1		1						1							1	1			
	c4	1			1	1													1	1			
	c5																						
	c6																						
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 assignments and reports	Bi-weekly	20 points
Quizzes	5th and 10th	20 points
Mid-Term Exam	Eighth week	20 points
Written Exam	Sixteenth week	40 points
Total		100 points

6- List of references:

6-1 Course notes:

The Report Writing Book by Dr Neveen Samir , 2015

6-2 Required books

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

6-3 Recommended books:

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

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:	Dr. Neveen Samir
Head of the Department:	Prof. Dr. Ashraf Taha
Date:	September, 2019

Modern Academy for Engineering and Technology in Maadi

Course Specification
GENN 341a: Project Management

A- Affiliation

Relevant program/s:	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:	December 2018

B - Basic Information

Title: Project Management **Code:** GENN 341a **Level:** 2 (5th Semester)
Credit Hours: 2 **Pre-requisite:** None
Contact Hours: **Lectures:** 2 **Tutorial: -** **Laboratory: -** **Total:** 2

C - Professional Information

1- Course Learning Objectives:

The objective of this course is to enable the students to understand the basic principles required for the project control, while considering its different goals and constraints. It also enable them to utilize various computer algorithms and analysis techniques for time, cost, quality, risk, and resources management, in addition to evaluating the efficiency of the management system.

2- Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Project Constraints, project management processes (A7).
a2- Body of the knowledge required for the project manager (A7)
a3- Roll and skills of the project manager (A7).
a4- Planning the project progress (A2).
a5- Evaluating and controlling the project progress (A5).
a6- Quality, risk, and resources management (A6)

b - Intellectual skills:

On successful completion of the course, the student should be able to:
b1- Design proper schedule that satisfies both time and resources constraints (B1)
b2- Investigate the project progress status (B11)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
None

d - General and transferable skills:

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

d1- Search for information in the references and in the internet (D9).

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

d3- Effectively manage time, and resources (D6)

d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A5, A6, A7
B	Intellectual skills	B1, B11
C	Professional and Practical Skills	None
D	General and transferable skills	D3 , D6, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Overview of the Project Management			
- Project constraints - Project Management processes	2		
- Body of Knowledge required for the project manager - Roll and Skills of the project manager	2		
Planning the Project			
- Planning Levels, Rules and Steps - Developing the Project's Vision, Mission, and Objectives	2		
- Work Breakdown Structure (WBS) - Critical-Path Method	2		
- Time-Constrained Schedule	4		
- Time and Recourse-Constrained Schedule	2		
Controlling the Project			
- Project Process Review	2		
- Earned-Value Analysis	4		
Managing the Project Team	2		
Quality Management	2		
Risk Management	4		
Total hours	**28**		

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			
	a2	1											1		1			
	a3	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		1			
	b2	1				1							1		1			
Applied Prof. Skills																		
General 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	Assignments	3rd , 5th , 9th , and 11th Weeks	20
	Quizzes	4th , 6th , 10th , and 12th Weeks	20
Mid-Term Exam		7th Week	20
Practical Exam		-	-
Written Exam		16th week	40
Total			100

6- List of references:

6-1 Course notes: Printed notes

6-2 Required books

- Joseph Heagney, (2016), "Fundamentals of project Management", 5th Edition, AMACOM, NY.

6-3 Recommended books:

- Project Management Institute, (2018), "A Guide to the Project Management Body of Knowledge (PMBOK® Guide)", 6th Edition. PMI Inc, PA, USA

6-4 Periodicals, Web sites, etc. (Last Viewed - Dec. 2018)

- https://www.pmi.org
- https://www.pmi.org/pmbok-guide-standards/foundational/pmbok
- https://www.pmi.org/learning/publications

7- Facilities required for teaching and learning:

- Computer, and Data show

Course coordinator:	Dr. Fawzy Hashim
Head of the Department:	Prof. Dr. Shouman E. I. Shouman
Date:	December 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification
GENN351: Engineering Economy

A- Affiliation

Relevant program:	Manufacturing Engineering and Prod. Tech. BSc Program Electronic Engineering and Comm. Tech. BSc Program. Computer Engineering and Info. Tech. BSc.Program
Department offering the program:	Manufacturing Engineering and Prod. Tech. Department Electronic Engineering and Comm. Tech. Department. Computer Engineering and Info. Tech. Department
Department offering the course:	Manufacturing Engineering and Prod. Techn. Department
Date of specifications approval:	September 2018

B - Basic information

Title: Engineering Economy **Code:** GENN351 **Year/level:** Senior 1-2nd.Semester
Credit Hours:2 **Lectures:** 2 **Tutorial:** - **Practical:** -
Pre-requisite: --

C - Professional information

1 – Course Learning Objectives

A study of this course will enable the student to:

- Evaluate the present and future money investment that devoted to the mechanics of time-value.
- Calculate and compare between alternatives based on their equivalent annual worthy, present worth, and rate of return.
- Account the effects of depreciation and taxes on economic evaluations in extensively treatment

2 2- intended Learning Outcomes (ILOS)

A - Knowledge and understanding

By the end of the course the student should be able to demonstrate the knowledge and understand:

a1- The major capabilities and limitations of cash flow analysis for evaluating proposed capital investments (A1, A2).

a2- Mathematics, economics, and engineering principles necessary for analyzing benefit - cost problems (A1, A5).

a3- The basics to the mechanics of time-value calculations and comparisons of alternatives based on their equivalent annual worthy, present worth, and rate of return. (A2, A14)

a4- The role of the effects of both depreciation and taxes as well on economic evaluations (A7, A18)

B - Intellectual skills

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

b1- Apply knowledge of mathematics, economics, and engineering principles to identify, formulate, analyze, and solve engineering economic problems (B1)

b2- Use basics to the mechanics of time-value calculations and comparisons of alternatives based on the equivalent annual & present worth and rate of return (B2).

b3- Develop an understanding of managerial accounting and economic principles (B7, B8).

b4- Carry out role of accounting and the effects of depreciation and taxes on economic evaluations

in extensively treatment (B13).

C - Professional and practical skills

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

c1- Use appropriate techniques, skills, and tools to identify, formulate, analyze, and solve engineering economic problems (C1).

c2- Communicate results of the modeling process to management and other non-specialist users of engineering analyses (C7).

c3- Use of benefit-cost analysis for public projects (C9).

c4- Use modern computer tools, such as spreadsheets, in financial realities from the business world including both opportunities and restrictions- that influence economic decisions (C5).

c5- Use graphics effectively for justifying solutions to engineering economics problems (C13).

D - General and transferable skills

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

d1- Work in stressful environment and within constraints. (D2)

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

d3- Work in a team and involve 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, A2, A5, A7, A14, A18
Intellectual skills	B1,B2,B7,B8, B13
Professional and practical skills	C1,C5,C7,C9, C13
General and transferable skills	D1, D2, D3, D7, D9

3 – Contents

Topic	**Lecture Hours**	**Tutorial hours**	**Practical hours**
Cash Flow: Cash flow table, Cash flow diagram, Equivalence and time Value of Money	2 2		
Compound Interest: Single payment interest, Uniform annual payment series, Arithmetic gradient payment series, Geometric gradient payment series	6		
Nominal and Effective Interest	2		
Engineering Problem Analysis: Present worth method,Equivalent uniform annual method, Rate of return method	8		
Depreciation: Straight line technique, Sum of years-digits technique, Declining balance technique, Sinking fund technique	4		
Income Taxes	4		
Total hours	**28**		

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			Modeling	Self-learning	Experimental				Class Works	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understand.	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
Intellectual Skills	b1	1	1		1	1											1		1		1
	b2	1			1	1											1		1		1
	b3	1	1		1	1															
	b4	1	1		1	1											1		1		1
Applied Prof. kills	c1	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
	c4	1		1	1	1				1							1	1	1		1
	c5		1		1	1				1								1			
General Tran. Skills	d1	1	1	1							1						1	1	1		1
	d2	1	1	1							1						1	1	1		1
	d3	1	1	1							1						1	1	1		1
	d4	1	1	1							1						1	1	1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments & Reports	4 by term	10
Quizzes & Reports	6 quizzes	30
Mid-Term Exam	6th. Week	20
Written Exam	16th. Week	40
Total		100

6- List of references:

6.1 Course notes

Lecture notes and handouts.

6.2 Required books

- Matcolm H., "Engineering Economy Principle", USA, McGraw-Hill, 1982

6.3 Recommended books

- Sullivan W. G., Wicks E. M., and Luxhoj J. t., "Engineering Economy", 12th ed., Prentice Hall, 2003
- Barish N. B., "Economic Analysis for Engineering and Managerial Decision Making", McGraw-Hill, 1982

6.4 Periodical, Web sites, etc.:

- http://www.isr.umd.edu/~austin/ence202.d/economics.html
- http://mysite.du.edu/~jcalvert/econ/enecon.htm
- http://www.slideshare.net/ngduyquang1001/basics-of-engineering-economy

7- Facilities required for teaching and learning

- Students are required to use own PCs Computer,
- Data show and Computer programs

Course Coordinator:	Dr. Abdelmagid A. Abdalla
	Dr. Metwally Hussein Metwally
Head of the Department:	Prof. Nabil Gadallah
Date:	September 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
القوانين الهندسية والأخلاق المهنية :GENN353

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: Basic Science Department
Date of specifications approval: June, 2018

B - Basic information

Title: القوانين الهندسية والأخلاق المهنية	**Code:GENN 352**	**Level:**Sixth.	Semester: (Junior)
Credit Hours 2hrs	**Lectures** 2 hrs	**Tutorial** -	**Practical** -

C - Professional information

1 – Course Learning Objectives:

مع نهاية هذا المقرر يكون الطالب قد تمكن من فهم وتحليل وتطبيق المصطلحات والمفاهيم القانونية و التشريعات الصناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمرانى و قوانين وتشريعات بيئية لحماية البيئة المصرية و المناقصات والعطاءات- قانون تنظيم المناقصات والعطاءات و العقود الهندسية الدولية و العقود الهندسية المحلية و المطالبات والتحكيم. بالإضافة إلى ذلك ، فإنه يوضح دور ومسؤوليات المهندس مع الأخذ في الاعتبار القواعد واللوائح التي تتحكم في عمله ، وحقوقه وواجباته ، وإلى علاقته مع الاستشاريين من العمل المتخصص وأخيراً مسؤوليات المالك والمقاول. وتهدف الدورة أيضًا إلى دراسة التدريب وقوانين النقابات ، مع التأكيد على أهمية تحقيق أخلاقيات المهنة ومبادئها من خلال تقديم مقدمة لها.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- منهجيات حل المشاكل الهندسية ، وجمع البيانات وتفسيرها (A5)
a2- نظم ضمان الجودة ، ومدونات الممارسات والمعايير ومتطلبات الأمن الصناعي والقضايا البيئية (A6)
a3- أخلاقيات المهنة والآثار المترتبة على الحلول الهندسية على المجتمع والبيئة (A9, A10, A11)
a4- اللغة التقنية وكتابة التقارير الهندسية (A10)

b - Intellectual skills:

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

b1- ان يفكر بطريقة خلاقة ومبتكرة في حل المشكلات القانونية (B3, B9, B12)
b2- ان يدمج ويستبدل ويقيم مختلف الأفكار والآراء من وجه النظر القانونية (B4, B9)
b3- تخطيط وإجراء وكتابة تقريرعن مشروعاً و تكليف (B12)

C: **Professional and practical skills:**

On successful completion of the course, the student should be able to:
c1- أن يعرض ويحل أحد المشاكل القانونية فى احد الشركات(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(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	A5, A6, A9, A10, A11
B	Intellectual skills	B3, 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
مصطلحات ومفاهيم قانونية	4		
التشريعات الصناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمرانى	4		
قوانين وتشريعات بيئية لحماية البيئة المصرية	2		
المناقصات والعطاءات. - قانون تنظيم المناقصات والعطاءات	4		
العقود الهندسية المحلية - العقود الهندسية الدولية- المطالبات والتحكيم	4		
القواعد واللوائح التي تتحكم في عمل المهندس ، وحقوقه وواجباته	6		
دراسة التدريب وقوانين النقابات ، مع التأكيد على أهمية تحقيق أخلاقيات المهنة ومبادئها من خلال تقديم مقدمة لها.	8		
Total hours	**28**		

4 - Teaching and Learning and Assessement methods:

Course ILO's		Teaching Methods										Learning Methods				Assessement Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizes	Term papers	Assignments			
ge & Understa	a1	1	1	1								1				1		1					
	a2	1				1										1		1		1			

	a3	1		1								1				1				1			
	a4	1		1								1				1							
Intellectual Skills	b1	1														1		1		1			
	b2	1				1										1		1		1			
	b3	1	1	1								1				1							
Professional		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:

Asessement Method	Timing	Grade (Degrees)
Assignments, reports	Bi-2Weeks	20
Quizes	5th and 10th	20
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of References

6-1 Course notes

د شعبان رجب جودة، قوانين وتشريعات هندسيه، الأكاديمية الحديثه للهندسة و التكنولوجيا، المعادى، 2014.

6-2 Required books

6-3 Recommended books

جمال الدين احمد نصار، محمد ماجد خلوصى، قانون وتشريعات وعقود الاتحاد الدولى للمهندسين الاستشاريين، القاهرة، 2008.

6-4 Periodicals, Web sites, etc.

www.alamiria.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Dr. Abeer Hassan
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN354: Risk Management

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: September 2018

B - Basic information

Title: Risk Management **Code: GENN354** **Level:** three, First Semester

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

C - Professional information

1 – Course Learning Objectives:

On successful completion of the course, the student will be able to synthesize and respond to the complexity of legal issues within their risk management practice and demonstrate the ability to operate effectively in complex and unpredictable situations within professional contexts.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

The graduate should acquire knowledge and understanding of:

a1- Basic concepts of risk assessment. (A1, A2, A4)
a2- Basic concepts of hazards and risk factors. (A1, A2)
a3- Principles of rating the extent of potential harm and evaluating the likelihood that harm will occur. (A1, A2)
a4- Principles of controlling the risks. (A1, A2)
a5- Deciding priorities for action. (A1,A5)
a6- Strategies for managing the risks. (A1, A5, A6)
a7- Principles of strategic approaches for dealing with risks. (A6, A11)

b - Intellectual skills:

The graduate should have the ability to:

b1- Relate general theory to specific contexts. (B1,B2)
b2- Compare and analyze different risk situations and risk environments. (B3, B4)
b3- Develop problem solving approaches and controlling the risk. (B3, B4, B7,B9)
b4- Select and use appropriate Strategies, methods and techniques for identifying, diagnosing and dealing with risks. (B1, B4,B9)

c - Professional and practical skills:

The graduate should have the ability to:

c1- Apply risk identification and risk assessment techniques. (C1, C2)

c2- Create risk strategies and plans in different and changing contexts. (C1, C2, C6)

c3- Manage hazards more efficiently. (C1, C2)

c4- Undertake crisis management planning and implementation. (C1, C2, C11)

d - General and transferable skills:

The graduate should have the ability to:

d1- Enhance the ability to critically reflect on own and others' practice in order to improve own/others 'actions. (D1, D3)

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

d3- Search for information and engage in life-long self-learning discipline. (D2, D7,D9)

d4- Enhance the capability of working autonomously and within groups. (D1,D3,D5)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A5, A6, A11
B	Intellectual Skills	B1, B2, B3, B4, B7, B9
C	Professional and practical skills	C1, C2, C6, C11
D	General and transferable skills	D1, D2, D3, D5, D6, D7, D9

3 – Contents

Topics	Lecture hours	Tutorial hours	Practical hours
1- Identify risk assessment, hazards, and risk factors	2	-	-
2- Evaluating the hazards and risks.	4	-	-
3- Rating the extent of potential harm, and the likelihood that harm will occur.	4	-	-
4- Controlling the risks, Control measures.	4	-	-
5- Systems of control, Deciding priorities for action.	2	-	-
6- Case study 1: health services, Case study 2: call centers.	4	-	-
7- Case study 3: food production and processing, Case study 4: engineering and manufacture.	3	-	-
8- Strategies for managing the risks, Planning, Range of strategic approaches for dealing with risks.	3	-	-
9- Stakeholders and spreading the risks, and Policies.	2	-	-
Total hours	**28**		

4 - Teaching and Learning and Assessment methods:

	Teaching Methods	Learning Methods	Assessment Method

Course ILO's		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	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	
	a6	1	1	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	1	
	b2	1	1	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	1	1	
Applied Professiona l 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	
General Tran. Skills	d1	1	1	1						1					
	d2			1		1		1	1	1		1	1		
	d3		1	1				1	1	1					
	d4			1				1							

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments and Reports	Bi-Weekly	20
Quizzes	5th and 10th	20
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Risk Management

6-2 Required books

J. Jeyras (2002), "Risk management principles", planta Tree, UK

6-3 Recommended books:

- E. J. Vaughan, T. Vaugan (2007), 9th Edition, "Fundamentals of risk and insurance", John Wiley,
- M. Keegan (2004): The orange book of risk management- Principles and concepts", HM treasury concepts, London, UK
- E. Baranoff (2012)" Enterprise and individual risk management", Harvard Business Review US

6-4 Periodicals, Web sites, etc.:

https://www.investopedia.com/terms/r/riskmanagement.asp

http://www.freebookcentre.net/

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator: Dr. Nagat A. Elmahdy
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN451a: Advanced Computer Systems Implementation.

A- Affiliation

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

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

Department offering the course: Computer Engineering and Information Technology Department

Date of specifications approval: December 2018

B - Basic information

Title: Advanced Computer Systems Implementation **Code**: GENN451a **Level**: Junior, Semester-6

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

Pre-requisite: CMPN010

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students will be able to introduce effective, reliable and flexible IT services to the success of business initiatives today. Also provide an overview of configuration management, planning for configuration management, implementing configuration management, and running an effective configuration management system using the IT Infrastructure Library (ITIL).

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Effective, reliable and flexible IT services. (A8,A10)
a2- The specification, identification of all IT components. (A4,A8)
a3- ITIL for identifying, tracking, and controlling IT environment. (A6,A8)
a4- ITIL configuration management for every IT leader, manager, and practitioner. (A8,A12)
a5- The management, recording of the status and review of information of each of the configuration Ite (A8)
a6- Establishment of a clear roadmap for success, customize standard processes to business unique needs (A8, A10)

b - Intellectual skills:

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

b1- Assess current configuration management maturity and setting goals for improvement. (B8, B9)
b2- Gather and manage requirements to align ITIL with organizational needs. (B13, B15, B18)

b3- Describe the schema of your configuration management database (CMDB). (B9, B15)
b4- Identify, capture, and organize configuration data. (B11)
b5- Choose and run a pilot system. (B13, B14)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Choose the best tools for your requirements. (C14)
c2- Integrate data and processes to create a unified logical CMDB and configuration management service. (C6)
c3- Implement pilot projects to demonstrate the value of configuration management and to test your planning. (C13, C14, C15)
c4- Measure and improving CMDB data accuracy. (C5, C10)
c5- Leverage configuration management information. (C10)

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 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	A4, A6, A8, A10, A12
B	Intellectual skills	B8, B9, B11, B13, B14, B15, B18
C	Professional and practical skills	C5,C6, C10, C13, C14, C15
D	General and transferable skills	D1, D3, D4, D7, D9

3-Contents

Topic	Lecture hours	Tutorial hours
➢ Gathering and Analyzing Requirements.	2	1
➢ Determining Scope, Span, and Granularity.	2	1
➢ Comparison of alternatives and deciding the proper solution.	2	1
➢ Planning for Data Population.	2	1
➢ Putting together a useful project plan.	3	2
➢ Populating the configuration management database.	2	1
➢ Choosing the right tools.	2	1
➢ Implementing the process.	3	2
➢ Choosing and running a pilot system.	4	1
➢ The many uses for configuration information.	2	1
➢ Measuring and improving computer systems and computer network performance.	2	1
➢ Writing tenders and tender laws	2	1
Total hours	28	14

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	1			
	a4	1	1	1								1				1		1	1	1			
	a5	1														1		1	1	1			
	a6	1	1	1								1				1		1	1	1			
Intellectual Skills	b1	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			
Applied Professional Skills	c1	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		1	1	1			
	c5	1			1											1		1	1	1			
General Tran. Skills	d1			1								1							1				
	d2		1	1								1	1						1				
	d3	1	1									1							1	1			
	d4	1	1	1								1											
	d5											1	1						1				

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	16
	Reports	Two reports per semester	8
	Assignments	Bi-Weekly	16
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Non

6-2 Required books

TIEM - CHIEN,(2006), COMPUTER - AIDED MANAFACTURING, PRINTICE HALL,.
SADHU SINGH,(2010),COMPUTER AIDED DESIGN& MANUFACTURING, K P

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc. http://www.talkthecold.com/bizgoogle/ .http://www.SCI-hub.org/ . http://www.scrius.com/

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs. Microprocessor Lab

Course Coordinator: Dr. Assem Badr
Head of the Department: Ass. Prof.Dr. Wafaa Boghdady
Date: December 2018

Course Specification

GENN452: Civilization and Heritage

A- Affiliation

RELEVANT PROGRAM:	Architecture Engineering and Building Technology BSc Program
ment offering the program:	Architecture Engineering and Building Technology Department
Department offering the course:	Architecture Engineering and Building Technology Department
Date of specifications approval:	December, 2018

B - Basic information

Title: : Civilization and Heritage **Code:**Genn452 **Level** :4th., **Tenth Semester (Level Four)**

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

Elective 2: Humaniterian

Pre-requisite: None.

C - Professional information

1 – Course Learning Objectives:

The course aims to enhance the student's background in the field of social, cultural and humanitarian studies throughout identifying the cultural environment; this includes the meaning, features, characteristics, and social interaction, in addition to its impact on the human's needs in the field of specialization. In addition, it studies the cultural and environmental forms of expressions and the social pattern in cultural heritage throughout analyzing its elements and the alternative of dealing with it. Additionally study some case from old and modern traditional societies in the field of study.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding:

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

a1- Theories, issues, concepts demonstrating the interrelation between Civilization and Culture (A9)

a2- The role of the architect and planner in realizing the cultural and heritage dimensions when designing a new project. (A17)

a3- The role of the architect and planner in the conservation of Architectural heritage (A11)

B - Intellectual skills:

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

b1- Dealing appropriately with Heritage buildings and Architecture (B18, B21).

b2- Adapt innovative approaches in urban and architectural design considering the cultural backgrounds and realities of the local community (B19, B21)

C- Professional and practical skills:

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

c1- Identify, analyse, understand the interrelation between Culture and Architecture (C19).

c2- Generate and develop selective interventions that cope with the significance of Architectural Heritage (C21, C22).

c3- Evaluate and criticize the outcomes of urban and Architectural projects in relation to cultural and heritage considerations (C21, C22).

D - General and transferable skills:

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

d1- Collaborate effectively with the multidisciplinary dimensions of Architectural projects (D3).

d2- Search for information required to develop successful approaches in design (D6).

d3- Refer to relevant literature effectively in research projects (D9).

COURSE CONTRIBUTION IN THE PROGRAM ILO'S

ILO's		Program ILO's
A	Knowledge and understanding	A9, A11, A17
B	Intellectual skills	B18,B19, B21
C	Professional and practical skills	C19, C21,C22
D	General and transferable skills	D3, D6, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. General definitions, terms, and characteristics of culture and Architecture)	2		
2. Definitions, Classification of Heritage, World Heritage sites.	2		
3. The Interrelation between culture and traditional and	2		

heritage			
4. The Interrelation between culture and Civilization (General theories, concepts and examples)	2		
5. Architecture as cultural and Civilization expression - Features and characteristics (A detailed discussion of the multi-components of culture and its impacts in urban sites.	2		
6. Social interaction and urban environment – perception, environment image and behavior patterns.	2		
7. Midterm Exam	2		
8. The role of participation and community involvement in Architectural and Urban Design (Local Case studies)	2		
9. A brief discussion of the Anthropology as a tool of understanding local and indigenous cultures and its application to Architecture	2		
10. Regionalism of architecture and architectural expression	2		
11. Urban Heritage (A review of Values)	2		
12. Urban and Architectural Conservation (A review of interventions)	2		
13. Local and international case studies of urban and Architectural projects corresponding to the cultural dimension of the societies.	2		
14. Research project presentation and discussion	2		
Total hours	**28**		

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	projects	sketches			Self-learning	Discovering	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizes	Mid-Term Exam	Assignments	Project	Researche	
Knowledge & Understandi	a1	1	1	1										1		1			1			1	
	a2	1	1	1										1		1			1			1	
	a3	1	1	1										1		1			1			1	
lect ual Skill	b1	1	1	1										1		1						1	

	b2	1	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	
General Tran. Skills	d1			1								1	1								1	
	d2			1								1	1		1						1	
	d3			1								1	1								1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (%)	Grade (Degrees)
Mid-Term Exam	7-th Week	20%	20
Semester Work:	Quizzes	10%	10
	Reports	5%	5
	Assignments	5%	5
Practical research	Fourteen week	20%	20
Final Exam		40%	40
Total		100%	100

6- List of references:

6-1 Course notes: None.

6-2 Required books:

6-3 Recommended books:

- Fraser, D. (1968) "Village Planning in the Primitive World", Studio Vista, London
- Oliver, P. (1969) "Shelter and Society", Barrie & Rockliff, The Cresset Press, London
- Oliver, P. (1997) "Encyclopaedia of vernacular architecture of the world", Cambridge University Press, New York
- Rapoport, A. (1969) "House, Form and Culture", Englewood Cliffs, N.J

6-4 Thesis, Periodicals, Web sites, etc.

- أشرف كامل بطرس (1998) "الثقافة والنتاج البنائي - منهج لرصد وتحليل واستقراء الأبعاد الثقافية وتوظيفها في عملية البناء"رسالة دكتوراه غير منشورة، كلية الهندسة، جامعة القاهرة.
- حسن المويلحى (2005) "العمارة بين الثقافة والتنمية نحو فهم ثقافة مجتمع المستخدمين لخدمةعملية التنمية من خلال البرمجة المعمارية"رسالة ماجستير غير منشورة، كلية الهندسة، جامعة القاهرة.

2. Silverman, H., & Waterton, E., & Watson, S., (2017), “Heritage in Action: Making the Past in the Present”, Springer International Publishing, Switzerland.
3. Born, G., (2006), “Architecture, Preserving Paradise: The Architectural Heritage and History of the Florida Keys”, The History Press, USA.

- Oliver, P., (1997), “Encyclopedia of vernacular architecture of the world”, Cambridge University Press, New York, USA.

7- Facilities required for teaching and learning:

- Appropriate teaching class including presentation board and data show,
- Resources available in the library

Course coordinator: Dr. Nahed Omran
Head of the Department: Associate Professor: Ibrahem Gouda.
Date: December,2018

Modern Academy for Engineering

and Technology in Maadi

Course Specifications

GENN453: Industrial Psychology

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc. Program.
Depart offering the program:	Manufacturing Engineering and Production Technology Department
Depart offering the course	Manufacturing Engineering and Production Technology Department
Date specification approval	December 2018

B- BASIC INFORMATION

Title: Industrial Psychology **Code:** GENN453 **Year /level :4/** Semester 10

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

Pre-requisite: Non

C – Professional Information

1- Course Learning objectives:

A study of this course will enable the student to improve the performance of the whole work system as well to reduce the stress imposed on the working human being in industry .

2 – Intended Learning Outcomes (ILOs)

A-Knowledge and Understanding:

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

a1- the role of industrial engineer (A4 , A9,A18).

a2- the structural system of human work (A11) .

a3-the physical environmental impacts on human beings which can be assessed quantitatively (A11 , A19) .

B-Intellectual Skills

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

b1- Apply basics of ergonomics to instrument display, machine, control and lay out of work place (B3, B5).

b2- Consider effect of all environmental changes on equipment (B9).

b3- Diminishing the effects of physical environmental impacts on human beings (B9).

C- Professional and Practical Skills

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

c1- Create new product design adapted to the customer (C2, C4).

c2- Make the best use of human abilities (C8) .

c3- Use the ergonomic factors in domestic and industrial products (C8) .

D-General and Transferable Skills

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

d1-Collaborate effectively with multidisciplinary team (D1, D2).

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	A4، A9،A11،A18, A19
B	Intellectual skills	B3،B5،B9
C	Professional and practical skills	C2،C4،C8
D	General and transferable skills	D1،D2,D6,D9

3-Contents

Topic	**Lecture hours**	**Tutorial hours**
Industrial Design – Design concepts	2	
Ergonomics	2	
Application of ergonomics – Instruments – Controls – Work place.	2	
Aesthetic and ergonomics coordination	2	
Working condition and Environment	2	
Heating and Ventilation	2	
Local Ventilation - Industrial Ventilation	2	
Air condition systems – CFC'S - Ozone	2	
Depletion and Global Warning	2	
Noise – Exposure to noise – Noise control	2	
Technique – Vibration	2	
Lighting – Level of luminance – Factors	2	
Affecting the quality of lighting	2	
Human effectiveness	2	
Revision	2	
Total hours	30	

4 - Teaching and Learning and Assessments methods:

		Teaching Methods										Learning Methods				Assessment Method							
Course ILO's		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory					Modeling	Self-learning	Experimental				Class Works	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1		1															1		1		1
	a2	1		1															1		1		1
	a3	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
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			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Quizzes & Reports	Bi-Weekly	5
Mid-Term Exam	8th. Week	10
Written Exam	16th. week	35
Total		50

6- List of references:

6-1 Course notes: Lecture notes and handouts prepared by the course coordinator .

6-2 Required books : Non

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.: Non

7- Facilities required for teaching and learning:

- Non

Course coordinator: Prof. Mamdouh Saber

Head of the Department: Prof. Dr. Nabil Gadalla

Date: December 2018

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Modern Academy
for Engineering and Technology in Maadi

Course Specification
GENN 454: Marketing

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: June 2018

B - Basic information

Titl : Marketing **Code:** GENN 454 **Level:** Four **Semester:** 9th
Credit Hours: 2 hrs **Lectures:** 2 **Tutorial/Exercise:** - **Practical:** -
Pre-requisite: non

C - Professional information

1 – Course Learning Objectives:

مع نهاية تدريس هذا المقرر يكون الطالب قد اكتسب المهارات التى تمكنه من فهم مجال المبيعات, إدارة قوة المبيعات الاستراتيجية .عملية البيع الشخصية وتنظيم قوى المبيعات, تنميط وتوظيف البائعين, اختيار وتوظيف المتقدمين, تطوير برنامج المبيعات, تحفيز قوى المبيعات, تعويض قوة المبيعات والمصروفات والنقل, قيادة قوة المبيعات، التنبؤ بالمبيعات وتطوير الميزانيات و مناطق المبيعات الأقاليم, تحليل حجم المبيعات, تحليل تكلفة التسويق والربح، تقييم الأداء, كتابة عطاءات المسؤوليات الأخلاقية والقانونية.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- ادارة المبيعات وتطوير برنامج المبيعات (A9, A1)
a2- تحليل حجم المبيعات, تحليل تكلفة التسويق والربح، تقييم الأداء (A8)
a3- تنميط وتوظيف البائعين, اختيار وتوظيف المتقدمين (A9)

b - Intellectual skills:

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

b1– ان يكتسب الطالب مهارات فى مجال اساسيات ادارة المبيعلت (B1, B2)
b2- ان يدرك الطالب كيفية اختيار وتوظيف المتقدمين وافضل الطرق لتحفيز فريق المبيعات(B1, B2)
b3- ان يستطيع الطالب تحليل تكلفة التسويق حسب مناطق التوزيع و الربح (B1, B2)

d - General and transferable skills:

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

d1- تدريب الطالب على كيفية البحث عن المعلومات فى المراجع وفى الانترنت (D7)

d2- اكساب الطالب كيفية العمل فى فريق واشراكهم فى مناقشات جماعية (D1)

d3- تعليم الطالب على كيفية ايجاد الطرق الازمة لابتكار كل ما هو جديد (D7, D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A8, A9
B	Professional and practical skills	B1, B2
D	General and transferable skills	D1 , D7, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
مجال المبيعات, إدارة قوة المبيعات الاستراتيجية عملية البيع الشخصية وتنظيم قوة المبيعات	6		
تنميط وتوظيف البائعين, اختيار وتوظيف المتقدمين	4		
تطوير برنامج المبيعات, تحفيز قوى المبيعات تعويض قوة المبيعات والمصروفات والنقل	4		
قيادة قوة المبيعات و التنبؤ بالمبيعات	2		
تطوير الميزانيات و مناطق المبيعات الأقاليم	4		
تحليل حجم المبيعات, تحليل تكلفة التسويق والربح	3		
تقييم الأداء, كتابة عطاءات المسؤوليات الأخلاقية والقانونية	3		
مراجعة عامة	2		
Total hours	**28**		

4 - Teaching and Learning and Assessement methods:

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

Intellectual Skills	b1	**1**														1		1		**1**			
	b2	**1**														1		1		**1**			
	b3	**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:

Asessement Method	Timing	Grade (Degrees)
Mid-Term Exam	7- th Week	20
Research	8- th Week	15
Quizes	Bi –Weekly	20
Assignments	11- th Week	5
Written Exam	Sixteen -th week	40
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

Michael J. Baker, Susan Hart (2016), "The Marketing Book", 7th Edition.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.: Non

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs

Course coordinator: Dr. Shaymaa Sherif
Head of the Department: Prof. Dr. Ashraf Taha
Date: September, 2019

Modern Academy for Engineering

and Technology in Maadi

Course Specification

MNFN001: 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:
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: September 2018

B - Basic Information

Title: Introduction to Engineering Materials **Code:**MNFN001 **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 (A18).

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, B13)

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 (C19)
c2- Apply knowledge of materials to determine the suitable used materials (C1).
c3- professionally merge the engineering knowledge to improve material properties (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	A2, A3, A4, A18
B	Intellectual skills	B1, B2, B5, B13, B15, B17
C	Professional and Practical Skills	C1, C2, C19
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction	1		
• Types of engineering materials			
• Properties of materials, material testing principles			
2- Ferrous alloys and their properties	3		
2-1 Steel; types and uses			
2-2 Cast iron; types and uses			
3- Non-ferrous alloys and their properties	7		
3-1 Copper and its alloys			
3-2 Aluminum and its alloys			
4- Other engineering alloys	3		
5- Selection of Materials			
Total hours	**14**		

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			
	a3	1	1		1								1			1		1		1			
	4	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			
	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						
Applied Prof. Skills	c1	1	1	1		1																	
	c2	1	1	1												1	1	1	1	1			
	c3	1	1	1	1							1				1	1		1				
al Tran.	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, and reports	Bi-Weekly	20
Mid-Term Exam	8-th Week	20
quizzes assignments	Bi-weekly	20
Written Exam	Sixteenth week	40
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. Nasr Aref
Head of the Department: Prof.Dr. Nabil Gadallah
Date: September 2018

Modern Academy for Engineering

and Technology in Maadi

Course Specification

MNFN002: Engineering Graphics

A- Affiliation

Relevant program: Mechanical Design and Production Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology Department

Department offering the course: Manufacturing Engineering and Production Technology Department

Date of specifications approval: September 2018

B - Basic Information

Title: Engineering Graphics **Code:** MNFN002 **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],[B9]
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], [C13]
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	2, 4, 5, 8, 10
B	Intellectual skills	3, 5, 7, 8,9
C	Professional and Practical Skills	2, 3, 4, 11, 13
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
Total hours	**14**	**84**

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			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
Quizzes	Bi-Weekly	20
Mid-Term Exam	6th. Week	20
Written Exam	16th. week	40
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: Prof.Dr. Nabil Gadallah
Head of the Department: Prof.Dr. Nabil Gadallah
Date: September 2018

Modern Academy for Engineering

and Technology in Maadi

Course Specification

MNFN003: Principle of Production Engineering

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program

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

Department offering the course: Manufacturing Engineering and Production Technology BSc Program

Date of specifications approval: November, 2018

B - Basic Information

Title: Principle of Production Engineering | **Code:** MNFN003 | **Year/level:** Level zero

Credit Hours: 3 | **Lectures:** 2 | **Tutorial/Exercise:**-

Practical: 3 | **Total:** 5

Pre-requisite: MNFN 001

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 (B18)
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,A2,A4.
B	Professional and practical skills	B2,B3,B10,B18.
C	Intellectual 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		
➢ Sand casting, melting of metal & furnaces. Solidification, pattern allowances, sand molding & gating system. Die casting, centrifugal & investment casting.	6		12
➢ Types of welding, oxy- acetylene welding, electric- arc welding, submerged arc welding, MIG, TIG, resistance welding, soldering & brazing	5		10
➢ Hot & cold forming, rolling, extrusion, wire drawing & sheet metal forming	5		5
➢ Metal cutting processes (Turning, milling, shaping, grinding and drilling)	10		15
Total hours	**28**		**42**

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	a1	x	x	x															x	x	x	x	x
	a2	x	x	x								x							x	x	x	x	x
	a3	x	x	x								x							x	x	x	x	x
	4	x	x	x								x											x
	a5	x	x	x								x							x	x		x	x
	a6	x	x	x								x							x	x		x	x
Intellectual Skills	b1	x	x	x															x	x	x	x	x
	b2	x	x	x								x							x	x	x	x	x
	b3	x	x	x															x	x	x	x	x
	b4	x	x	x															x	x			x

Applied P. Skills	c1	x		x																x	x	x
	c2	x	x																	x	x	x
	c3	x	x									x							x	x		x
General Tran. Skills	d1		x	x																		
	d2			x														x				
	d3																		x			
	d4											x									x	

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	20
Written Exam	Sixteenth week	40
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.:

7- Facilities required for teaching and learning:
- Lecture room , and workshops

Course coordinator: Prof. Dr. Ahmed Kohail
Dr. Maher Khalifa
Head of the Department: Prof. Dr.. Nabil Gad Alla
Date: November, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 060: Summer Training-1

A- Affiliation

Relevant programs: 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: December, 2018

B - Basic Information

Title: Summer Training Level 0 **Code:** ELCN 060 **Level:** (0), First Summer
Credit Hours: 3 **Pre-requisite:** Nothing
Contact Hours: **Lectures:** 2 **Tutorial:** none **Laboratory:** 5 **Total:** 7

C - Professional Information

1 – Course Learning Objectives:

In summer training we introduce the basics elements, units of the electrical circuits and the student will be able to connect ant test different electrical circuits on the bread board. Fundamental equation such as Ohm's law is understood. It is a relationship of fundamental quantities that can have application in the most advanced setting. Introduce the Basic of electrical and electronics elements (Diode, Capacitor, resistance, Bipolar Junction Transistor…). Implement modern electronic application circuit in a Bread board and Printed circuit board.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Understanding the basic electronic and electrical elements (resistor, capacitor, inductor, BJT, MosFET). (A3, A4)
a2- Introduce basic electrical concept (Ohm's Law, Kirchhoff's circuit law, Series and parallel resistor circuit, voltage and current divider). (A3, A4).
a3- Understanding the operation of digital logic gates (AND, OR, NOR, NAND, XOR). (A3, A4)
a4- Understand the different electronic circuit using the basic electronic and electrical element. (A3, A4).

b - Intellectual skills:

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

b1 – Understand the characteristic of basic electrical & electronic elements. (B2, B3< B9)
b2- understand the ohm's Law. (B2, B3, B9)
b3- Understand the concept of circuit analysis (Kirchhoff's circuit law, Series and parallel resistor circuit, voltage and current divider). (B2, B3, B9)
b4- Understanding the operation of digital logic gates (AND, OR, NOR, NAND, XOR). (B2, B3, B9).

c - Professional and practical skills:

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

c1- introduce the basic electronic and electrical elements (resistor, capacitor, inductor, BJT, MosFET). (C1, C3)

c2- Implement circuit which introduce basic electrical concept (Ohm's Law, Kirchhoff's circuit law, Series and parallel resistor circuit, voltage and current divider). (C1, C3)
c3- Verify the truth tables of digital logic gates (AND, OR, NOR, NAND,XOR). (C1, C3)
c4- Implement the different electronic circuit using the basic electronic and electrical element. (555 Timer circuit, 10 minute alarm, power alarm). (C1, C3)

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. (D1, D3, D5)
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	A3, A4
B	Intellectual skills	B2, B3, B9
C	Professional and Practical Skills	C1,C3
D	General and transferable skills	D1, D3, D5, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Basic electronic and electrical elements		-	1
• Introduce basic electrical concept		-	1
• Operation of digital logic gates		-	1
• Implement the different electronic circuit		-	2
Total hours	**1**	**-**	**5**

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																				
	a2	1	1	1								1											
	a3	1	1	1								1											
	a4	1		1		1								1									
Intellectual Skills	b1					1						1											
	b2					1						1											
	b3					1						1											
	b4					1						1		1									

Applied Prof. Skills	c1		1	1			1					1								1			
	c2		1	1			1					1								1			
	c3			1			1					1								1			
	c4			1		1	1						1							1			
General Skills	d1																						
	d2																						
	d3			1									1	1									

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Practical Exam	Fifth day	Pass or Fail
Total		Pass Or Fail

6- List of references:

6-1 Course notes: Summer Training Level 0 "Theoretical part"

6-2 Required books

Boylestad, "Introductory circuit analysis", prentice Hall, 2003.

6-3 Recommended books: William. Hayat "Engineering Circuit analysis", Wiley, 2009.

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator: Dr. Sara Fouad Mohamed
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 111: Electrical Circuit Analysis-1

A- Affiliation

Relevant program/s:	Electronic Engineering and Communication Technology BSc Program, Computer Engineering and Information Technology B.Sc. 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:	December, 2018.

B - Basic Information

Title: Electrical Circuit Analysis-1 **Code:** ELCN 111 **Level:** (1), Third Semester
Credit Hours: 3 **Pre-requisite:** MTHN 002, ELCN 060
Contact Hours: **Lectures:** 2 **Tutorial:**1 **Laboratory:** 2 **Total:** 5

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, A4)
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, B3, 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, B3, 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

Topic	Lecture hours	Tutorial hours	Practical hours
• Units Dimensions and Standards.	2	1	2
• Circuit Variables and elements.	2	1	2
• Simple Resistive Circuit.	3	2	3
• Node Voltage Method.	2	1	2
• Mesh Current method	2	1	2
• Source Transformation and Supper Position Principle.	4	2	4
• Thevenin's Theorem.	3	2	3
• Operational Amplifiers.	4	2	4
• Inductance, Capacitance and Mutual Impedances.	2	1	2
• Response of RL and RLC Circuits.	4	1	4
Total hours	**28**	**14**	**28**

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 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				
	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	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 Prof. Skills	c1						1													1			
	c2						1													1			
	c3						1													1			
	c4						1													1			
	c5						1													1			
	c6						1													1			
General Skills	d1						1																
	d2						1																
	d3						1																

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	3rd and 9th Weeks	10
	Reports	Two reports per semester	Bonus 2 deg. per report
	Assignments	5th and 10th weeks	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

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

- 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. Shouman S.E.I.
Date:	December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN112: Electrical Circuit Analysis-2

A- Affiliation

Relevant program/s:	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:	December, 2018

B - Basic Information

Title: Electrical Circuit Analysis-2 **Code:** ELCN 112 **Level:** (1), Fourth Semester
Credit Hours: 3 **Pre-requisite:** ELCN 111
Contact Hours: **Lectures:** 2 **Tutorial:** 3 **Laboratory:** – **Total:** 5

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)
a7- Principles of the two-port circuits. (A4, A5)

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:

On successful completion of the 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 sinusoidal sources. (C1, C2)
c5- Design the frequency- selective circuit. (C1, C2)
c6- Implement the techniques of two- port terminated network and analyze it to obtain its characteristics. (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, A3, A4, A5
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

Topic	Lecture hours	Tutorial hours	Practical hours
• Sinusoidal steady- state analysis.	2	3	-
• Techniques of circuit analysis in AC.	4	6	-
• Sinusoidal steady- state power calculation	4	6	-
• Balanced three- phase circuit.	4	6	-
• Introduction to Laplace- Transform.	2	3	-
• Laplace- Transform circuit analysis.	3	6	-
• Techniques of circuit analysis using Laplace- Transform.	3	6	-
• Frequency selective circuits.	4	3	-
• Two- ports networks.	2	3	-
Total hours	**28**	**42**	—

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				
	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 Prof. Skills	c1	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				1	1				
General Skills	d1																						
	d2			1	1																		
	d3																						

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	3rd and 9th Weeks	10
	Reports	Two reports per semester	Bonus 2 deg. per report
	Assignments	5th and 10th weeks	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

- 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., 8th Edition, 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. Shouman S.E.I.
Date:	December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 113: Electrical Measurements

A- Affiliation

Relevant program/s:	Electronic Engineering and Communication Technology BSc Program, Computer Engineering and Information Technology B.Sc. 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:	December, 2018

B - Basic Information

Title: Electrical Measurements **Code:** ELCN 113 **Level:** (1), Fourth Semester
Credit Hours: 3 **Pre-requisite: :** ELCN 111
Contact Hours: **Lectures:** 2 **Tutorial:**1 **Laboratory:** 2 **Total:** 5

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, and C17).

c2- Calculate, and analyze the resulting systematic errors (C2, C5, and 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 Instruments.	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.		1	
• 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	**28**	**14**	**28**

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	Term papers	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				
General Skills	d1	1			1							1	1										
	d2	1	1	1	1							1	1				1	1					
	d3	1	1	1	1							1	1				1	1					

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	3rd and 9th Weeks	10
	Reports	Two reports per semester	Bonus 2 deg. per report
	Assignments	5th and 10th weeks	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

- Shouman, S. E.I., (2018) ELCN 113, Electrical Measurements, Cairo, Egypt.
- Shouman, S.E.I., (2018) ELCN 113: Electrical Measurements (Lab.), Cairo, Egypt.

6-2 Required books

- Hefrick, A.D. and Cooper, W.D., (2009) Modern Electronic Instrumentation and Measurement Techniques, Prentice- Hall International, Inc., London UK.
- Witte, R.A., (2014) Electronic Test Instruments: Analog and Digital Measurements, Dorling Kindesley Pearson Education, USA.

6-3 Recommended books:

- Bell, D.A. (2013) Electronic Instrumentation and Measurements, OXFORD UNIVERSITY PRESS, 3rd edition, UK.
- Jones, D.L, and Chin F.A.,(1991) Electronic Instruments and Measurements, Prentice- Hall International, Inc., London UK.

6-4 Periodicals, Web sites, etc.

IEEE Transactions on Instrumentation and Measurement, Last accessed November 15, 2018.
http://folk.uio.no/trulsn/images/Electrical-measurements.pdf, Last accessed November 20, 2018.
https://lecturenotes.in/materials/14532-electrical-measurements-and-measuring-instruments?utm_source=subjectpage&utm_medium=web&utm_campaign=materialpage, last visited October, 2018.

7- Facilities required for teaching and learning:

- Electrical and Electronic Lab.
- Computer, and data show.

Course coordinator:	Prof.: Shouman S.E.I.
Head of the Department:	Prof.: Shouman S.E.I.
Date:	December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN114: Modern Theory for Semiconductor Devices

A- Affiliation

Relevant program/s:	Electronic Engineering and Communication Technology BSc Program, Manufacturing Engineering and Production Technology BSc Program Computer Engineering and Information Technology B.Sc. Program
Department offering the program:	Electronic Engineering and Communication Technology Department Manufacturing Engineering and Production Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Electronic Engineering and Communication Technology Department
Date of specifications approval:	December, 2018

B - Basic Information

Title: Modern Theory for Semiconductor Devices **Code:** ELCN 114 **Level:** (1), Third Semester

Credit Hours: 3 **Pre-requisite:** PHYN 002

Contact Hours: **Lectures:** 2 **Tutorial:**1 **Laboratory:**2 **Total:** 5

C - Professional Information

1 – Course Learning Objectives:

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

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

b - Intellectual skills:

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

b1- apply 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).
b4- classify and compare the different ways of the conductivity of elements (, B5, B7, B8).

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, C8)
c2- Calculate the energy of electron and photon (C1, C2, C3).
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, 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, A8, A9
B	Intellectual skills	B1, B2, B4, B5, B6, B7, B8, 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	2		2
• Classical and modern theory of light	1		2
• Plank's explanation for black body radiation	2	1	2
• Photo electric effect	1	1	2
• Compton experiment	2	1	2
• Compton scattering	2	1	2
• Particles behaving as a wave and particle wave complementarity	1	1	2
• Introduction to wave mechanics	2	1	2
• The uncertainty principle	1	1	2
• Wave function for free particle	1		
• Wave function of the particle	2	1	2
• The simple harmonic oscillator	2	1	2
• Scanning tunneling microscopy	2	1	
• Introduction to atomic physics	1		
• Models of atoms	2	1	2
• Bonding mechanisms	2	1	2
• Bonding in solids	1	1	
• Classical free electron model of metals	1	1	2
Total hours	**28**	**14**	**28**

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			
	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			
	a7	1		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		1				
	b4	1	1		1		1					1				1	1	1	1	1			
Applied Prof. 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						
General Skills	d1			1		1						1							1				
	d2		1	1								1	1						1				
	d3	1	1									1							1	1			
	d4	1	1	1								1											
	d5											1	1						1				

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	3rd and 9th Weeks	10
	Reports	Two reports per semester	Bonus 2 deg. per report
	Assignments	5th and 10th weeks	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

L. Soliman, Modern Theory for Semiconductor Devices, Lectures notes, Modern Academy, 2012.

6-2 Required books

Peter Y. Yu, Manuel Cordona, Fundamental of semiconductors: physics and Materials Properties, springer, London, 2010.

6-3 Recommended books:

- Jasprit Singh, Modern physics for engineers, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2004.
- Charles E. Burkhardt · Jacob J. Leventhal, Foundations of quantum physics, Springer Science, Business Media, LLC, New York, 2008.

6-4 Periodicals, Web sites, etc.

Physics.exchange.com
www.iop.org

7- Facilities required for teaching and learning:

- Semiconductor Physics Lab.
- Library
- Internet

Course coordinator: Prof. Dr. Laila Soliman
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN115: Semiconductors for Microelectronics

A- Affiliation

Relevant program/s:	Electronic Engineering and Communication Technology BSc Program, Computer Engineering and Information Technology B.Sc. 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:	December 2018

B - Basic Information

Title: Semiconductor for Microelectronics **Code:** ELCN 115 **Level:** (1), Fourth Semester

Credit Hours: 3 **Pre-requisite:** ELCN 114

Contact Hours: **Lectures:** 2 **Tutorial:**1 **Laboratory:** 2 **Total:** 5

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding. They have to understand the structures, characteristics, principals of operation and applications of PN junction (diode). They have to study the characteristics (forward and revers bias) of zener and tunnel diodes, 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 characteristics.

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 properties of semiconductor materials (A3, A8, A9).
a2- The crystal structure and band structure of semiconductors (A8, A9).
a3- the difference between intrinsic and doped semiconductor carriers transport (A1, A2).
a4- the structures, characteristics, principals of operation and applications of PN junction (diode (A1, A3).
a5- the characteristics (forward and revers bias) of zener and tunnel diodes (A1, A3).
a6- the schottky, Ohmic contact, heterojunction, bipolar junction transistor (BJT), junction field effect transistor (JFET), metal oxide semiconductor transistor (MOSFT) (A1, A3).
a7- the physical structure, basic configuration and I-V characteristics. (A1, A2, A3).

b - Intellectual skills:

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

b1- do an 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).
b4- classify and compare between different types of diodes and transistors (, B5, B7, B8).

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)

c2- Calculate the conductivity of different types of semiconductors (C1, C2, C3).
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).

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, A8, A9
B	Intellectual skills	B1, B2, B4, B5, B6, B7, B8, B12
C	Professional and Practical Skills	C1, C3,C3, C4, C7, 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		1
• Classify different types of semiconductors	1		2
• Crystal structure and band structure of semiconductor	1	1	1
• Conduction in different types of semiconductor	2	1	2
• P-N junction	1	1	1
• Forward and revers bias and breakdown	2	1	2
• Diode	1	1	2
• Zener diode	2	1	2
• Tunnel diode	2	1	2
• Solar cell	1		2
• Application of diodes	1	1	1
• Schottky diode	2	1	
• Tunnel diode	2	1	2
• Bipolar junction transistor (BJT)	2	1	2
• Junction field effect transistor (JFET)	2	1	2
• Metal oxide semiconductor transistor(MOSFT)	3	1	2
• Physical structure, basic configuration and I-V characteristics	2	1	2
Total hours	**28**	**14**	**28**

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 Prof. 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 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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	3rd and 9th Weeks	10
	Reports	Two reports per semester	Bonus 2 deg. per report
	Assignments	5th and 10th weeks	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

L. Soliman, semiconductor for Microelectronics, Lecture notes, 2012.

6-2 Required books

Peter Y. Yu, Manuel Cordona, Fandamental of semiconductors: physics and Materials Properties, springer, 2010.

6-3 Recommended books:

- Jasprit Singh, Modern physics for engineers, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2004.
- Charles E. Burkhardt · Jacob J. Leventhal, Foundations of quantum physics, Springer Science, Business Media, LLC, New York, 2008.

6-4 Periodicals, Web sites, etc.

www.iop.org
physics.exchange.com

7- Facilities required for teaching and learning:

- Semiconductor Physics Lab.
- Library
- Internet

Course coordinator: Prof. Dr. Laila Soliman
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 160: Summer Training Level 1

A- Affiliation

Relevant program/s: 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: December, 2018

B - Basic Information

Title: Summer Training Level 1 **Code:** ELCN 160 **Level:** (2), Second Summer
Credit Hours: 3 **Pre-requisite:** ELCN 060
Contact Hours: **Lectures:** 2 **Tutorial:** none **Laboratory:** 10 **Total:** 12

C - Professional Information

1 – Course Learning Objectives:

- The training is divided into two parts one to learning PCB (Printed Circuit Board) and the other about Arduino. Each one of training spent for one week.
- PCB is the structure that: mechanically support components and provides electrical conduction paths between circuits. The purpose of the PCB training is to provide a step-by-step introduction to the EAGLE PCB-Design Package by way of a simple example.
- Arduino is a flexible programmable hardware platform designed for artists, designers, tinkerers, and the makers of things. Arduino's little, blue circuit board, mythically taking its name from a local pub in Italy, has in a very short time motivated a new generation of DIYers of all ages to make all manner of wild projects found

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- Understanding the PCB design process. (A14, A15)
a2- Introduce basic function of Eagle program. (A14, A15).
a3- Understanding the principle operation of embedded system specially Arduino Uno. (A14, A15)
a4- Introduce the main concept of application system using arduino. (A14, A15).

b - Intellectual skills:

On successful completion of the course, the student should be able to:
b1 – Understand the characteristic of Printed circuit board kite. (B1)
b2- Design the DC power supply. (B5)
b3- Explain required programming skills with C programming. (B1)
b4- Introduce a flexible programmable hardware platform Arduino Uno. (B1).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Implement discrete active devices (self biased grounded emitter NPN transistor). (C2, C3)
c2- Design and implement the Dc power supply circuit. (C2,C3)

c3- Provide a step-by-step introduction to the EAGLE PCB-Design Package by way of a different example. (C3, C6)
c4- Printed the Dc power supply circuit using FR-4 board. (C3, C6)
c5- Explain required programming skills with C programming and knowledge of electronics theory. (C2, C3, C6)
c6- Introduce a flexible programmable hardware platform Arduino Uno. (C2,C3)
c7-Implement different project using Arduino: (C2,C3, C6)

- 4 Bit counter,
- Controlling 220 VAC lamp and Dc fan using light.
- Controlling servo motor using light.

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. (D1, D3, D5)
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	A14, A15
B	Intellectual skills	B1, B5
C	Professional and Practical Skills	C2,C3,C6
D	General and transferable skills	D1, D3, D5, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Implement discrete active devices.		-	1
• Design and implement the Dc power supply circuit		-	1
• Introduction to the EAGLE PCB-Design Package.		-	1
• Printed the Dc power supply circuit using FR-4 board.		-	2
• Explain required programming skills with C programming		-	1
• Introduce a flexible programmable hardware platform Arduino Uno		-	2
• Implement different project using Arduino		-	2
Total hours	**1**	**-**	**10**

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																				
	a2	1	1	1									1										
	a3	1	1	1									1										
	a4	1		1		1								1									
Intellectual Skills	b1					1						1											
	b2					1						1											
	b3					1						1											
	b4					1						1											
Applied Prof. Skills	c1	1	1	1			1					1								1			
	c2	1	1	1			1					1								1			
	c3			1			1					1								1			
	c4			1			1						1	1						1			
	c5	1	1	1		1	1						1										
	c6		1	1			1																
	c7		1	1			1						1	1									
General Skills	d1																						
	d2																						
	d3			1									1	1									

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Practical Exam	10 days	Pass or Fail
Total		Pass or Fail

6- List of references:

6-1 Course notes: Summer Training Level 1 "Theoretical part"

6-2 Required books

- Mark L. Murphy, "Android Programming tutorial", Commons war LLC, 2009.
- Mark I. Montrose " Printed Circuit board Design Techniques for EMC", IEEE press series of electronic, 2015

6-3 Recommended books: William. Hayat "Engineering Circuit analysis", Wiley, 2009.

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator: Dr. Sara Fouad Mohamed
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 210: Control- I (Principles of Automatic Control)

A- Affiliation

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

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

Department offering the course: Electronic Engineering & Communication Technology Department

Date of specifications approval: December, 2018

B - Basic Information

Title: Control – I **Code: ELC 210** **Level (2)**, Fifth Semester

Contact Hours: **Lectures:** 3 **Tutorial:**1 **Practical:**2 **Total:** 6

Credit Hours: 4 **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).	3	1	2
• Mathematical background for solving of linear time-invariant systems (differential equations & Laplace transform).	3	1	2
• Transfer function of system, block algebra & Mason's gain formula.	3	1	2
• Closed loop system subjected to disturbances & errors of system.	4	1	3
• State-space representation of dynamic system & state transition matrix& solution of state equation.	3	2	2
• First order & second order open and closed loop responses.	3	1	2
• Effect of roots of the system characteristic equation (poles of system) on the system transient response parameters.	3	1	2
• Basic control actions (P, PI, PD and PID), and system performance.	4	1	3
• Stability of linear control system (Routh-Hurwitz criterion).	3	1	2
• Root locus plots concept and system analysis.	3	1	2
• Frequency response analysis and Bode diagrams.	3	1	2
• The concept of stability in the frequency domain (polar diagram & Nyquist criterion).	3	1	2
• Design of control system via root locus and frequency domain.	4	1	2
Total hours	**42**	**14**	**28**

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	1			1		1	1	1			
	a4	1	1										1					1					
	a5	1	1		1	1						1	1			1		1	1	1			
	a6	1	1		1											1		1	1	1			
	a7	1			1											1		1	1	1			
	a8	1																		1			
	a9	1			1											1		1		1			
	a10	1			1											1		1		1			
Intellectual Skills	b1	1	1		1	1						1	1			1		1	1	1			
	b2	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			
	b5						1										1		1				
Applied Prof. Skills	c1	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	1			
General Skills	d1	1		1	1	1						1	1			1		1	1	1			
	d2						1										1						
	d3	1			1	1							1			1		1	1	1			

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	10
Semester Work	Quizzes	5th , 10th Week	10
	Assignments	3rd , 9th Week	20
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
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 books

Ogata, K. (2010) Modern Control Engineering Prentice-Hall, NC.

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: Prof. Dr. Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 211: Signal Analysis

A- Affiliation

Relevant program/s:	Electronic Engineering & Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Electronic Engineering & Communication Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Electronic Engineering &Communication Technology Department.
Date of specifications approval:	October, 2018

Title: Signal Analysis **Code:** ELCN 211 **Level:** (2), Fifth Semester
Credit Hours: 3 **Lectures**: 2 **Tutorial**: 2 **Laboratory**: **Total**: 4
Contact Hours: **Pre- requisite**: MTHN 103

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 convolution, 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- Definition of signal, signal classification and basic operation in signal. (A5, A24)
a2-. Difference between signal mathematical representation in time and frequency domains (A5, A24)
a3- Represent Fourier series analysis for periodic signal**.** (A5, A24).
a4- Represent Fourier transform analysis for aperiodic signal. (A5,A24)
a5- Properties of Fourier transformation. (A5, A24)
a6- Characteristics of system and features of Linear time invariant system (LTI). (A5, A24)
a7- Basics of random process and random variables. (A5, A24)
a8- Some important definitions related to random variables such as; mean and variance. (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- Classify system and calculate output signal from system.(B2, B11)
b5-Obtain mean and variance 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 signal analysis in frequency domain for different periodic and aperiodic signal. (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

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to Signals, Classification of signals and Signal Operators.	3	3	-
• Calculate Energy and power signal	3	3	-
• Signal Representation by orthogonal signal set – Fourier series	3	3	-
• A periodic Signal representation by Fourier Integral.	3	3	-
• Transforms of same useful function and properties of Fourier Transform.	3	3	-
• Introduction and properties of system	3	3	-
• Analysis Linear Invariant system (LTI).	3	3	-
• Probability – Random variables – Statistical averages	3	3	-
• Cumulative Distribution function with different distribution.	4	4	-
Total hours	**28**	**28**	**-**

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									
	a5	1	1		1	1						1	1	1									
	a6	1		1	1	1				1				1									
	a7	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									

	a10	1			1	1		1			1		1	1									
Intellectual Skills	b1	1			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	1									
	b5	1				1		1			1	1	1	1									
Applied Prof. Skills	c1	1							1														
	c2	1							1														
	c3	1							1														
	c4	1							1														
General Skills	d1																						
	d2																						
	d3																						

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Quizzes	Week 5,10	15
	Assignments	Week 3,9	15
	Reports	Week13	10
Mid-Term Exam		7-th Week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

Signal Analysis (I) "*Theoretical part*"

6-2 Required books

1- Alan V. Oppenheim, Alan S. Willsky "Signal & systems" Prentice Hall, 1997.

2- William A. Gardner " Introduction to random process with application to signal & systems" Mc Graw Hill, 1990

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. Mohamed El-Hawary

Head of the Department: Prof. Dr. Shouman S.E.I

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELCN212: Microelectronics Circuits-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: December, 2018

B - Basic information

Title: Microelectronics Circuits-1 **Code:**E LCN212 **Level:** Junior, Fifth Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2
Pre-requisite: PHYN002

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
B	**Intellectual skills**	B2 , B5 , B7
C	**Professional and practical skills**	C3 , C17
D	**General and transferable skills**	D3, D5 , D6 ,D7

3- Course Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Operational Amplifiers Configurations	2	-	4
• Applications of Op-Amps	2	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
• Basic Principles of Semi-conductors	2	1	2
• Diode Terminal Characteristic	2	1	2
• Diode Applications	2	1	2
• Design of Half wave & Full wave rectifier	2	1	2
• Diode circuits	2	1	2
• JFET Transistors	2	1	2
• JFET Trans- conductance & ac parameters	2	1	4
• CMOSFET Functions	2	1	2
• CMOSFET Applications	2	1	-
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	1
	b3	1			1				1					1	
	b4	1												1	
Applied Professional Skills	c1	1						1			1	1	1	1	1
	c2	1			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											

5-Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	8
	Reports	Two reports per semester	4
	Assignments	Bi-Weekly	8

Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
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. A., Bates D., (2016) ***Electronic Principles***, Macmillan Mc Graw Hill Inc, ISBN - 978-0-07-337388-1.

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.Malvino.com
4. www.Talkelectronics.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. Shouman Elshahat*
Date: 24 / 12 / 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN214: Electronic Measurements

A- Affiliation

Relevant program/s:	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:	December 2018

B - Basic Information

Title: Electronic Measurements	**Code:** ELCN214		**Level:** (2), sixth Semester	
Contact Hours:	**Lectures:** 2	**Tutorial:**1	**Laboratory: 2**	**Total:** 5
Credit Hours: 3	**Pre-requisite:** ELCN113			

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand and analyze different techniques for improving performance of electromechanical conventional measuring instruments, utilizing relevant electronic circuits. They should also understand the construction, concepts, and operation of different analog & digital measuring instruments such as: voltmeters, ammeters, ohmmeters, frequency meters, oscilloscopes, and waveforms analyzers and generators. Also it enables the students to understand the principles of design, operation, and application of transducers and data acquisition 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- Analog Measurements. (A5, A15)
a2- Digital Measurements. (A5 ,A15)
a3- CRT and Special Types Oscilloscope. (A15)
a4- Waveform Analysis and Generation. (A8, A15)
a5- Data Acquisition Systems (A5 ,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)
c4- Establish and construct digital measuring circuits (C3, C20)

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- Communicate with others, and involve effectively in a team wok (D1)
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, A8, A15
B	Intellectual skills	B2, B3, B12
C	Professional and Practical Skills	C3, C12, C15, C20
D	General and transferable skills	D1, D4, D6 , D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Analog Measurements: • Emitter Follower Voltmeter	2	1	2
• Difference Amplifier Voltmeter • Operational Amplifier Voltmeter Circuits	4	2	4
• AC Electronic Voltmeter • Ohm and Current Measurements	2	1	2
Digital Measurements: • Digital Voltmeters DVMs • Digital Frequency Meters	2	1	2
CRT Oscilloscope: • Cathode Ray Tube • Deflection Amplifiers	2	1	2
• Sweep Generator • Automatic Time Base	4	2	4
• Dual Trace Oscilloscope • Wave Forms measurements	2	1	2
Special Types Oscilloscopes: • Sampling Oscilloscope • Digital Storage Oscilloscope (DSO)	4	2	4
Waveform Analysis and Generation: • Analog Spectrum Analyzer • Digital Spectrum Analyzer	2	1	2
Data Acquisition Systems • Transducers • Signal Conditioning Circuits	2	1	2
• Digital to Analog Converters (D/A) • Analog to Digital Converters (A/D)	2	1	2
Total hours	**28**	**14**	**28**

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			1		1
	a2	1	1	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	1	1	1		1	1		1
	a7	1	1	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	1	1			1		1
Intellectual Skills	b1	1	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	1		1		1			
	b4				1		1											1		1			
	b5				1			1				1						1			1		
Applied Prof. Skills	c1				1													1					
	c2			1	1		1					1					1	1		1			
	c3	1	1		1			1		1		1	1	1	1	1		1			1		1
	c4	1	1	1	1					1	1		1	1	1	1	1	1					1
General 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			
	d3	1	1		1		1				1		1	1	1	1		1		1			

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7th Week	20
Semester Work	3th and 9th weeks	10th Week	8
	5rd and 11th Weeks	10th Week	4
	1 reports per semester	5 (Bonus)	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
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, Electronic Instrumentation & Measurements, 2nd edition, Prentice-Hall, Inc., 1997.

6-3 Recommended books:

Larry D. Jones, and A. Foster Chin, Electronic Instrumentation & Measurements, 2nd edition, Prentice- Hall, Inc., 1991.

6-4 Periodicals, Web sites, etc.

(Last Accessed - Dec. 2018)

- MIT Open courseware

https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-071j-introduction-to-electronics-signals-and-measurement-spring-2006/

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. Shouman S.E.I.
Date: December, 2018

Course Specification
ELCN215: 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, 2017

B - Basic information

Title: Communications-1 **Code:** ELCN215 **Level:** Junior, Sixth Semester
Credit Hours: 4 **Lectures:** 3 **Tutorial:**1
Pre-requisite: ELCN211

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to make overview on basic communication system stages and focus especially on analog communications systems. Also channel problems and classifications are displayed at the beginning of this course before discussion of different techniques for analog continuous wave modulation process.

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. (A2, A15, A18).
a2- Classifications of signals, communication channels and media (A18, A24).
a3- Systems and signals representations in communications systems. (A18, A24)
a4- Main concept of information theory. (A2, A19)
a5- Amplitude modulation process AM. (A18, A24)
a6- Frequency modulation process FM. (A18, A24)
a7- Phase modulation process PM. (A18, A24)

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b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Decide suitable solution for communication channel problem. (B2, B17)
b2- Discriminate between different techniques of analog continuous wave modulation techniques. (B15, B19)
b3- Estimate waveform, spectrum and bandwidth at the output of each stage in analog communication system. (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. (C14, C18)
c2- Observe and record input and output signals obtained by each communication system module using oscilloscopes then comment on results. (C12, C18)
c3- Take measurements for signal voltages and frequency obtained at the output of various types of filters and oscillators. (C12, C18)
c4- Examine simple communication system using various forms of analog modulation/ demodulation modules:

DSB-SS, SSB, FM, and PM. (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 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	A2, A15, A18, A19, A24
B	Intellectual skills	B2, B15, B17, C19
C	Professional and practical skills	C12, C14, C15, C18, C20
D	General and transferable skills	D3, 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- Communication channels; types, problems and proposed solution.	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	20
Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
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- kendey,Davis *Electronic Communication systems***,** Mc Graw-Hill Book

6-3 Recommended books

1- S. Haykin, *Communication systems*, 4th edition J. W. 2001.

2- A. Yadav, *Analog Communication system***,** 1st edition University Science Press, 2008.

6-4 Recommended Web site

1- https://en.wikipedia.org/wiki/Communications_system

2- https://www.docsity.com/en/introduction-to-analog-communication/539207/

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. Shouman EL- Shahhat*
Date:	December 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELCN260: Industrial Training-1

A- Affiliation

Relevant program/s:	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:	December 2019

B - Basic Information

Title: Industrial Training-1 **Code:** ELCN260 **Level:** (2), Third Summer
Credit Hours: 3 **Pre-requisite:** 65 Credits
Contact Hours: **Lectures:** - **Tutorial:**- **Practical:** 6 **Total:** 6

1 – Course Learning Objectives:

A study of this course will enable the student:

- 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:

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

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 ELCN360 (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 ELCN360 (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, A5, A6, A7, A8, A9, A11, A12, A14
B	Intellectual skills	B1, B3, B4, B5, B7, B9, B12, B13, B14, B15
C	Professional and Practical Skills	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16
D	General and transferable skills	D1, D2, D3, D4, D5, D6, D7, D8, D9

3 – Contents

Topic	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 and 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
	a3		1	1	1	1		1	1			1	1		1
	a4	1		1		1			1	1					
	a5	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		
	b3	1		1		1		1		1		1	1		1
	b4		1		1	1	1	1	1	1			1		1
Applied Profession al Skills	c1	1	1	1	1	1		1		1			1		1
	c2					1		1		1			1		
	c3		1	1	1	1		1		1			1		
	c4	1			1			1		1			1		
General Tran. Skills	d1	1	1		1	1	1	1		1			1		
	d2		1	1	1	1	1	1	1	1			1		
	d3		1	1		1		1		1			1		
	d4		1			1		1		1		1	1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Attendance	Bi-Daily in training period	20
Semester Work: seminars and Reports	Bi-Daily in training period	20
Practical Exam	End week in training period	20
Oral Exam	tenth week	40
Total		100

6- List of references:

6-1 Course notes

- None

6-2 Required books

- As needed

6-3 Recommended books

- As needed

6-4 Periodicals, Web sites, etc.

- 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: Dr. Sara Mohammed Hassan
Head of the Department: Prof. Dr. Shouman E.I. S
Date: December, 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELCN 261: Seminar

A- Affiliation

Relevant program/s:	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:	December 2018

B- Basic Information

Title: Seminar **Code:** ELCN 261 **Level:** 2 (6th Semester)
Credit Hours: 1 **Pre-requisite:** 65 Credits
Contact Hours: **Lectures: -** **Tutorial:** 2 **Laboratory: -** **Total:** 2

C- Professional Information

3- Course Learning Objectives:

The objective of this course is to teach the students how to prepare and give a successful seminar, about contemporary topics in their field of study. It enables them to select relevant topics, and allocate relevant references (text books and research papers). The students are supervised while reviewing and summarizing the allocated references, in addition they are allowed to practice an invited talk to speak about their selected subjects, using different demonstration methods.

4- Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Contemporary engineering topics (A12)
a2- Technical language and report writing (A10)

b - Intellectual skills:

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

b1- Plan and conduct report writing (B14)

c - Professional and practical skills:

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

c1- Prepare and present technical reports (C12)
c2- Organize and conduct technical seminars (C9)

d - General and transferable skills:

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

d1- Search for information in the references and in the internet (D9).

d2- Present data and results orally and in written form (D3).
d3- Practice 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	C9, C12
D	General and transferable skills	D3 , D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Topics are selected by each, or group of students	-	2/W	-
Total hours	-	**28**	-

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			Oral Exam	Practical Exam	Quizzes	Term papers	Assignments	
Knowledge & Understanding	a1			1					1				1			1		
	a2			1					1				1			1		
Intellectual Skills	b1			1					1				1			1		
Applied Prof. Skills	c1			1					1				1			1		
	c2			1					1				1			1		
General Skills	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 (Reports)		2nd, 4th, 6th, 8th, 10th, 12th Weeks	60
Mid-Term Exam		-	-
Practical Exam		-	-
Oral Exam	Final Report	14th week	10
	Presentation		10
	Discussion		20
Total			100

6- List of references:

6-4 Course notes: -

6-5 Required books

- Relevant references are selected by the students

6-6 Recommended books:

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

- Computer, and Data show

Course coordinator: Dr. Fawzy Hashim
Head of the Department: Prof. Dr. Shouman E. I. Shouman
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 320:Control- 2 (Digital and PLC Control)

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: December, 2018

B - Basic information

Title: Control –2 **Code:** ELCN 320 **Level: (3),** Eighth semester
Pre-requisite: ELCN210
Credit Hours: 4 **Lectures:**3 **Tutorial:**1 **Practical:**2 **Total:** 6

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,	3	2	2

and Solving of linear discrete-time state equation).			
➢ Pole placement and state estimation "Observers" of discrete systems.	4	2	
➢ Sequential control "discrete-state controller" using PLC's (Basic structure & Ladder diagrams).	4	1	2
➢ Transducers in industrial application.	2		4
Total hours	**42**	**14**	**28**

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
Professional Applied 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)**
Mid-Term Exam		7th Week	20
Semester Work)	2 quizzes	Week 5,10	10
	4 assignment	Week 2,4,9,11	5
	1 Report	13th Week	5
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
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: Dr. Lubna Fekry
Head of the Department: Prof.Dr.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 321: 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:	December, 2018

B - Basic information

Title: Communications-2	**Code:** ELCN321	**Level: (3),** Seventh Semester		
Credit Hours: 4	**Pre-requisite :**	ELCN 215		
Contact Hours:	**Lectures:** 3	**Tutorial:**1	**Practical:** 2	**Total:** 6

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. (A18, 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 DM. (A19, A24)
a4- Stages of Radio communication system. (A18, 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. (A15)
a7- Performance of analog and digital comm. systems in the presence of random noises. (A18, 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)
b2- Determine signal waveform obtained at the output of each stage in PCM system. (B18)
b3- Take decision about suitable analog pulse modulation technique based on service needs and channel features. (B4, B14)
b4- Take decision about suitable digital pulse modulation technique based on service needs and channel features. (B4, B14)
b5- Estimate probability of error obtained in the presence of noise channel using different digital modulation techniques. (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 of modulators (PWM – ASK – FSK - PSK) multiplexers (FDM – TDM). (C15, C19)
c2- Observe and record input and output signals obtained by each communication system module using oscilloscopes then comment on results. (C15, C19)
c3- Take measurements for signal voltages and frequency obtained at the output of various types of modulators (PWM – ASK – FSK - PSK) multiplexers (FDM – TDM). (C19, C20).
c4- Examine simple communication system using various forms of modulators (PWM – ASK – FSK - PSK) multiplexers (FDM – TDM). (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	A15, A18, A24, A27
B	Intellectual skills	B4, B14, B15, B18
C	Professional and practical skills	C15, C19, C20
D	General and transferable skills	D3, D6, D7

3- Contents:

Topics	**Lecture hours**	**Tutorial hours**	**Practical hours**
1-Introduction to sampling process.	6	1	0
2-Analog pulse modulation techniques: PAM, PWM, and PPM.	10	4	10
3- Pulse code modulation PCM.	4	2	4
4- Delta modulation DM.	2	2	0
5- Digital radio communication systems.	3	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.	2	1	0
9- Performance of analog and digital comm. systems in the presence of random noises.	2	0	0
Total hours	**42**	**14**	**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	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					

5- Assessment Timing and Grading:

Assessment Method		**Timing**	**Grade (Degrees)**
Mid-Term Exam		7th Week	20
Semester Work)	2 quizzes	Week 5,10	10
	4 assignment	Week 2,4,9,11	5
	1 Report	13th Week	5
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
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

1. J. Proakis ,Digital Communications, McGraw-Hill Book Comp, 2001.
2. R. Gallager Principles of Digital Communication, 1st edition, Cambridge.

6-4 Recommended Web Site

1- https://en.wikipedia.org/wiki/Communications_system
2- https://www.slideshare.net/lineking/digital-communication-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.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 323: 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:	December, 2018

B - Basic information

Title: Electromagnetic Field Theory **Code:** ELCN 323 **Level: (3),** Seventh Semester
Credit Hours: 3 **Pre-requisite:** PHYN002
Contact Hours: **Lectures:** 2 **Tutorial:** 3 **Practical:** 0 **Total**: 5

C - Professional Information

1 – Course Learning Objectives:

One of the main objectives of this course is to study the interactions between electric charges at rest and in motion including the analysis, synthesis, physical interpretation, and application of electric and magnetic fields. The other main objective is to prepare the students for the subsequent courses in this area of specialization such as microwave engineering, microwave devices as well as antenna and wave propagation.

In details, these two objectives aim to enable the student to:

- Understand the basic concept of electrostatic force, field, potential and Energy.
- Solve the electrostatic problems using Coulomb, Gauss, image methods, and Laplace equations by applying boundary conditions.
- Understand the basic concept of static magnetic field, force, circuits, and inductance.
- Solve the magneto static problems using Ampere, Biot-Savart laws.
- Understand the basic concept of time-varying field, Maxwell's Equations, and the 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, A21
B	Intellectual skills	B1, B2
C	Professional and practical skills	C1,C2
D	General and transferable skills	D6

3- Contents:

Topics	Lecture hours	Tutorial hours
1- Basics concepts of Electrostatic field.	6	9
2- Methods of Solution of electrostatic problems.	6	9
3- The steady current field and resistance.	2	3
4- Basics concepts and Laws of The steady magnetic field	2	3
5-Solution of Steady Magnetic problems.	4	6
6- Time varying field and Maxwell's equations Faraday's law and displacement	4	6
7- Plane wave propagation in different media.	4	6
Total hours	28	42

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)
Mid-Term Exam		7th Week	20
Semester Work)	2 quizzes	Week 5,10	20
	4 assignment	Week 2,4,9,11	10
	1 Report	13th Week	10
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes

Electromagnetic Field Theory.

6-2 Required books

Nannapneni R. N. (1997) *Elements of Engineering Electromagnetic*, New Jersey: Prentice Hall, Inc.

6-3 Recommended books:

Hayt, W. H. & Buck, J. A (2000) Engineering Electromagnetics, USA, McGraw Hill.

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: Data show and Computer lab.

Course coordinator: Dr. Ibrahim Amin Ibrahim
Head of the Department: Prof.Dr.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 324: 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: December, 2018

B - Basic information

Title: Microwave Engineering **Code:** ELCN324 **Level: (3(** , Eighth Semester
Credit Hours: 4 **Pre-requisite:** ELCN323
Contact Hours: **Lectures: 3** **Tutorial:**1 **Practical:** 2 **Total:** 6

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the fundamental concepts of:

- Plane wave reflection from media interface (parallel and perpendicular polarization).
- Rectangular and circular waveguides TE, TM modes (analysis – design and applications).
- Coaxial line and micro strip line (low – frequency and high – frequency solutions).
- Attenuation due to conductor and dielectric loss.
- Field analysis of transmission lines (traveling and standing waves).
- Smith chart and impedance matching (single stub and double stub tuners).

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).	8	3	6
3- Coaxial line and micro strip line (low – frequency and high – frequency solutions)	8	3	5
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).	9	3	5
Total hours	**42**	**14**	**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	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)
Mid-Term Exam		7-th Week	20
Semester Work	2 quizzes	Week 5,10	6
	4 assignment	Week 3,5,9,11	8
	One Report	Week 12th	6
Practical Exam		fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes

1- Microwave Engineering "*Theoretical part*"

2- Microwave Engineering "*Practical part*"

6-2 Required books

Pozar, D. M. (2005) ***Microwave Engineering***, USA, John Wiley & sons, Inc.

6-3 Recommended books

Collin, R. E (1992) ***Foundations for Microwave Engineering,*** Second edition, N.Y, Mc Graw Hill.

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. Mokhtar Abd El- Haleem

Head of the Department: Prof.Dr.Shouman S.E.I

Date: December, 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification

ELCN 331: 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:	December 2018

B - Basic information

Title: Very Large Scale Integrated Systems **Code:** E LCN 331 **Year / level:** 3rd, Second semester
Credit Hours: 3 **Pre-requisite:** ELCN 313
Contact Hours: **Lectures:** 2 **Tutorial:** 1 **Practical: 2** **Total: 5**

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 technoloiges.

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, A14, 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 Assessement methods:

Course ILO's	Teaching Methods										Learning Methods				Assessement Method							
	Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Brain storming	Self Learning	Researches and Reports		Midterm	Quizes	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:

Asesement Method	Timing	Grade (Degrees)
Semister Work: assignments, Quizes & Reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of References

6-1 Course Notes:

- Very Large Scale Integrated Systems "Theoritical and Practical parts"

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.
- VLSI LAB.

Course Coordinator:	Dr. Samir Kamal
Head of the Department:	Prof. Dr. Shouman S.E.I.
Date:	December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 332: VHDL

A- Affiliation

Relevant program/s: 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: December, 2018

B - Basic Information

Title: VHDL **Code:** ELCN 332 **Level: (3)** , Eighth Semester
Credit Hours: 3 **Pre-requisite:** ELCN 213 & CMPN 111
Contact Hours: **Lectures:** 2 **Tutorial:**1 **Laboratory:** 2 **Total:** 5

C - Professional information

1 – Course Learning Objectives:

A study of this course will enable the student:

- Design and simulation basic logic circuits.
- Design and Evaluate Combinational-Circuit Building Blocks.
- Design and Test Circuits Employing Flip-Flops, Registers, Counters, and a Simple Processor.
- Design and Analyze Synchronous Sequential Circuits.
- Simulate and debug digital systems described in VHDL.
- Synthesize complex digital circuits at several level of abstractions.
- Test and evaluate the validation of any digital systems described in VHDL.
- Implement logic on an FPGA and a CPLD.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1-The main strategy for designing the hardware of embedded systems based on VHDL. (A1, A4, A8, A12, A13)
a2-The VHDL foundations, considerations and requirements. (A4, A8, A12, A14)
a3-The Designing of different digital communication systems based on VHDL. (A2,,A5, A14,A18, A19,A28)
a4-The basic requirements to meet the software programs with hardware applications. (A15, A18)
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 (B3, B17, B18, B19).

b3- Learn how to use the Xilinx's editor and simulator to develop code. (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, B5, 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).
c2- Use the Mentor graphic simulator to display the input and output digital signal of the designed systems. (C3, C14, C18, C20).
c3- Use the Xilinx downloader and FPGA kits to check practically the VHDL code. (C1, C3, C19, C20)
c4- Design, realize and check digital systems based on VHDL. (C7, C10, C18, C21)

d - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- Collaborate effectively within a team. (D1)
d2- Communicate effectively through present data and results orally and in written form. (D3)
d3- Effectively manage tasks, time, and resources. (D6)
d4- Search for information in references and internet to engage in life-long self-learning discipline. (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, A4, A5, A8, A12,A13, A14, A15, A16, A18, A19,A28
B	Intellectual skills	B1,B2,B3,B4,B5,B8,B9,B11,B12,B13,B15,B16,B17,B18,B19
C	Professional and Practical Skills	C1, C3, C7,C10, C14,C15, C18, C19, C20, C21
D	General and transferable skills	D1, D3, D6, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- System design process.	2	1	-
2- Introduction to VHDL.	2	1	-
3- Using Xilinx editor and simulator to design different logic components.	4	2	4
4- Using Xilinx editor and simulator to design Combinational and sequential circuits.	6	4	4
5- Using Xilinx editor and simulator to design different digital systems.	2	2	6
6- Using Mentor graphic simulator to display the input and output digital signals.	2	2	2
7- Using Xilinx simulator to check the verification of digital systems.	2	1	4
8- Using Xilinx downloader and FPGA Kits to check the validation of digital systems.	4	1	4
9- Making a mini-project.	4	-	4

Total hours	**28**	**14**	**28**

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	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	
	a3	1		1	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	
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	1	1	1	
	b4	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		
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
	c4	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					
	d4	1	1							1			1		
	d5	1	1	1					1	1					

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	2 quizzes	Week 5,10	6
	4 assignment	Week 3,5,9,11	8
	One Report	Week 12th	6
Practical Exam		fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes

1- VHDL "Theoretical part"
2- VHDL "Practical part"

6-2 Required books

- Mazor Stanley, Langstraat Patricia, 2013, "A Guide to VHDL", New York, Springer.
- A.Pedroni Volnei , 2004, "Circuit Design with VHDL", Cambridge, Massachusetts London, England, MTI Press.

6-3 Recommended books

- Chu Pong P, 2008, "FPGA Prototyping by VHDL Examples", Hoboken, New Jersey, Wiley.

6-4 Periodicals, Web sites, etc.

- http://www.Xilinx.com
- http://www.mentor.com

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP & White board and Data show facility.
- Computers and VHDL editors and simulators.
- FPGA training kits.

Course coordinator: Dr. Sara Mohammed Hassan
Head of the Department: Prof.Dr.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN333: 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: December, 2018

B - Basic information

Title: Radar System and Remote Sensing **Code:** ELCN 333 **Level:** (3), Eighth Semester
Credit Hours: 3 **Pre-requisite:** ELCN 215
Contact Hours: **Lectures:**2 **Tutorial:** 3 **Practical:** 0 **Total**:5

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).	4	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	6	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.	6	14	—

• Secondary Surveillance Radar: 1. Basic principles. 2. Problems with Secondary Surveillance Radar. 3. Multipath.	4	4	—
• Radar Subsystems 1. Synchronizers 2. Radar transmitters 3. Radar Receivers.	6	4	—
• Remote Sensing Radar	2	2	—
Total	28	42	—

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	Assignments	3rd , 9th Week	20
	Quizzes	5th , 10th Week	20
Mid-Term Exam		7-th Week	20
Practical Exam		-	-
Written Exam		Sixteenth week	40
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: Prof.Dr. Magdy O.Tantawy
Head of the Department: Prof.Dr.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 334: Advanced Topics of 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: December, 2018

B - Basic information

Title: Advanced Topics of communications **Code**: ELCN 334 **level: (3)** , Eight h Semester
Credit Hours:3 **Pre-requisite:** ELCN 321
Contact Hours: **Lectures:** 2 **Tutorial:**2 **Practical:** none **Total: 4**

C - Professional information

1 – Course Learning Objectives:

- To introduce the mobile radio propagation large scale path loss especially the reflection-diffraction-scattering phenomena.
- To introduce the large scale fading showing the indoor and outdoor propagation model.
- To explain the small scale fading showing power delay profile, coherent bandwidth, Doppler spread and coherence time.
- To introduce the characteristics of frequency selective fading, flat fading, small and large fading channels as a multipath channel.
- To explain the diversity, channel coding as mitigation techniques to solve the deep fade effect.
- To explain the multicarrier modulation technique and multiple access techniques used in UMTS, WiMAX, Wifi to avoid fading phenomena.
- To explain the structure of different wireless communication system like WiMAX, Wifi, UMTS16.

2 - Intended Learning Outcomes (ILOS)

a- Knowledge and Understanding:

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

a1- Understand the path loss model and phenomena appear in mobile radio propagation large scale fading. (A4, A17)
a2- Mathematical model of indoor and outdoor propagation model of large scale fading .(A4, A17).
a3- Understand the small scale fading , power delay profile, coherent bandwidth, Doppler spread, and coherence time. (A4, A17)
a4-Characteristics of frequency selective and flat fading, large and small fading channel.(A4, A17)
a5- The objective of diversity technique as a mitigation method.(A4, A17)
a6- Multicarrier modulation techniques as a modulation technique used in different wireless communication system.(A4, A17)
a7- How to explain the characteristics of different wireless communication system like WiMAX, Wifi, and UMTS .(A4, A17)

b - Intellectual skills:

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

b1 - Calculate the indoor and outdoor path loss model and propagation phenomena**.** (B1)

b2- Calculate the mean excess and coherent bandwidth from channel impulse response. (B1, B2, B11)
b3- Take a decision about of type of channel fading type according to coherent bandwidth and coherence time. (B2, B3, B11)
b4- Calculate the outage probability of single and diversity branches. (B1, B3, B8)
b5- Perform some operation of multicarrier modulation technique as a mitigation methods. (B1, B11)
b6- Perform some operation of multiple access technique. (B1)

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)
c2- Simulate a complete digital communication system with channel model using software program and study the bit error rate performance of the system. (C13)

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. (D1, D3, D5)
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**	A4, A17
B	**Intellectual skills**	B1, B2, B3, B8, B11
C	**Professional and practical skills**	C13
D	**General and transferable skills**	D1, D3, D5, D6, D7

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1-Path loss large scale.	4	4	-
2-Small scale fading and multipath.	6	6	-
3- Diversity, channel coding.	4	4	-
4- Multicarrier modulation technique& multiple accesses.	6	6	-
5- Universal UMTS12, UMTS16, WiMAX, Wifi.	8	8	-
Total hours	**28**	**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	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		1			1	1	
	a6	1	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			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	
Applied Professional Skills	c1			1	1			1		1					
	c2			1	1			1		1					
General Tran. Skills	d1														
	d2														
	d3			1					1	1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: quizzes	5-th, 10th Week	10
Semester Work: assignments and reports	3-rd , 9-th, 13-th Week	15
Semester Work: Seminar	Fourteenth Week	15
Mid-Term Exam	7-th Week	20
Practical Exam	Fifteenth week	-
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes

1- Advanced Topic of communications "*Theoretical part*"

6-2 Required books

1-Theodore S. Rappaport, Wireless Communications: Principles and Practice, Prentice Hall PTR, 2002.

2- Bernard Skalr " Digital Communication , fundamental and application" Prentice Hall PTR, 2001

6-3 Recommended books

Marcos Katz, Frank H. P. Fitzek, "WiMAX Evolution: Emerging Technologies and Applications", **Wiley, 2009.**

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator: Dr. Sara Fouad Mohamed
Head of the Department: Prof. Dr. Shouman E. I. S
Date: December, 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELCN360: Industrial Training-2

A- Affiliation

Relevant program/s:	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:	December 2019

B - Basic Information

Title: Industrial Training-2 **Code:** ELCN360 **Level:** (Senior 3), Eleven Semester
Credit Hours: 3 **Pre-requisite:** 101 Credits + ELCN260
Contact Hours: **Lectures:** - **Tutorial:**- **Practical:** 6 **Total:** 6

1 – Course Learning Objectives:

A study of this course will enable the student:

- 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:

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

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 (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- Awareness of real practical difficulties (B12, B13).
b3- 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, A5, A6, A7, A8, A9, A11, A12, A14
B	Intellectual skills	B1, B3, B4, B5, B7, B9, B12, B13, B14, B15
C	Professional and Practical Skills	C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C15, C16
D	General and transferable skills	D1, D2, D3, D4, D5, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
3- 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
4- 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 and 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
	a3		1	1	1	1		1	1			1	1		1
	a4	1		1		1			1	1					
	a5	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		
	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		
	c3		1	1	1	1		1		1			1		
	c4	1			1			1		1			1		
General Tran. Skills	d1	1	1		1	1	1	1		1			1		
	d2		1	1	1	1	1	1	1	1			1		
	d3		1	1		1		1		1			1		
	d4		1			1		1		1		1	1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Attendance	Bi-Daily in training period	20
Semester Work: seminars and Reports	Bi-Daily in training period	20
Practical Exam	End week in training period	20
Oral Exam	tenth week	40
Total		100

6- List of references:

6-1 Course notes

- None

6-2 Required books

- As needed

6-3 Recommended books

- As needed

6-4 Periodicals, Web sites, etc.

- 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: Dr. Hazem Hassan M. El-Banna
Head of the Department: Prof. Dr. Shouman E. I. S
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 361: Project 1

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:	December, 2018

B - Basic information

Title: Project 1	**Code:** ELCN 361	**Level: (3)**, Seventh Semester		
Credit Hours: 2	**Pre-requisite:** ELCN 213 +	101 Credits		
Contact Hours:	**Lectures:** 1	**Tutorial:**1	**Practical:** 2	**Total:** 4

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to enable the students to design the basic analoge and digital communication systems such as AM, FM, 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 analog and digital modulators
- 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 PAM and PWM modulator and demodulator (A2, A4, A5, A14, A1)
a5-Design of ADC & DAC (A1, A4, A5, A15)
a6- 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, A5, 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
1. Introduction to the project	1	0	2
2. Design amplifier using BJT	1	2	2
3. Design oscillators **4.** Sinusoidal (RC, LC) oscillators **5.** Non-Sinusoidal oscillators	4	4	8
6. Design basic analog and digital transceiver **7.** AM and FM **8.** PAM and PWM	4	4	12
9. Design ADC and DAC	2	2	2
10. Design class A power amplifier	2	2	2
Total hours	**14**	**14**	**28**

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	$a1$	1	1	1	1	1	1	1	1	1		1	1	1	1
	$a2$	1	1	1	1	1	1	1	1	1		1	1	1	1
	$a3$	1	1	1	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	1		1	1	1	1
	$a6$	1	1	1	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
	$b4$	1		1			1	1		1			1	1	1
	$b5$	1		1			1	1		1			1	1	1
Professional Skills	$c1$		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
ns fe	$d1$			1				1	1	1			1		1

		1												
	$d2$	1		1				1	1	1			1		1
	$d3$	1		1				1	1	1			1		1
	$d4$	1		1				1	1	1			1		1
	$d5$	1		1				1	1	1			1		1

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	2 quizzes	Week 5,10	5
	4 assignment	Week 3,5,9,11	5
	Hardware implementation	Bi-Weekly	30
Practical Exam		fifteenth week	10
Written Exam		Sixteenth week	20
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 and Orcad programs.

Course coordinator: Dr. Eman Mohammed Mahmoud
Head of the Department: Prof.Dr.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN421: Antennas and Wave Propagation

A- Affiliation:	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:	December, 2018

B - Basic information:

Title: Antennas and Wave Propagation **Code:** ELCN421 **Level:** (4), Tenth Semester
Credit Hours: 4 **Pre-requisite**: ELCN323
Contact Hours: **Lectures:** 3 **Tutorial:** 1 **Laboratory:** 2 **Total: 6**

C - Professional Information

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. It also deals with the different wave propagation types in different mediums.

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 , A4)
a2- Definition and physical concepts of antenna parameters (A20)
a3- Solution Methods of antenna equations (A5 , A20)
a4- knowledge of wave propagation mechanism and ways (A1, A19)
a5- Evaluation of pattern and design parameters for most types of antennas (A5 ,A20)

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	5
• Loop antenna (circular and square)	2	2	5
• Special types of wire antennas (Helix and Yagi)	3	2	4
• **Aperture antennas:** • Rectangular and circular aperture	3	1	-
• Microstrip antennas	3	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	42	14	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	Midtem	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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	Week 5,10	6
	Assignment	Week 3,5,9,11	8
	Report	Week 12th	6
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
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. B. (2005) "Antenna Theory Analysis and Design" 3rd edition, New York, John Wiley.

6-3 Recommended books

Krauss, J. & Marhefka, R.J. (2002) "Antennas For All Application", Boston, McGraw Hill.

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:	Dr. Hazem H. El-Banna
Head of the Department:	Prof.Dr.Shouman S.E.I
Date:	December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN422: Communications3

A- Affiliation

Relevant program/s:	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:	December, 2018

B - Basic Information

Title: Communications3 **Code:** ELCN422 **Level:** (4), Ninth Semester
Credit Hours: 4 **Pre-requisite:** MTHN207
Contact Hours: **Lectures:** 3 **Tutorial:**1 **Laboratory:** 2 **Total:** 6

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to introduce the main stages of digital communication system, focusing on coding processes and discrete channel analysis. He should be able to introduce the main principles of information theory and to explain the source coding technique with examples. He should also be able to introduce the importance of channel coding stages, showing various types of that technique and to analyze the discrete channel memory-less model 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 types. (A4, A19, A27)
a5- The discrete channel memory-less model. (A27)
a6- How to estimate the probability of error. (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. (B1, B2, B3, B11)
b3- Design optimum channel encoder circuit taking in consideration advantages and disadvantages of encoder parameters. (B3, B15, B18)
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. (B1, B2, B15)
b6- Calculate the probability of error for a given discrete channel model. (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- Simulate simple digital communication system in the presence of noisy channel, transmitting text and measure the effect at the receiver with/without channel coding techniques. (C12, C14)
c3- 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)
c4- 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)
c5- 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)
c6- Simulate complete digital communication system with convolutional encoder / decoder stages in the presence of noisy channel and find the BER at the receiver for different circuit configurations. (C13, C14)
c7- Compare between different channel coding techniques: Hamming – cyclic – convolutional based on BER performance versus SNR variation. (C12, C14)
c8 - Design software program to analyze the discrete memory-less channel and measures its performance. (C12, C13)

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1- Communicate effectively through assignments. (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, A18, A19, A27
B	Intellectual skills	B1, B2, B3, B11, B15, B18
C	Professional and Practical Skills	C12, C13, C14
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Measurement of Information – Zero memory information sources – Source extension - Markov source – source entropy.	12	4	6
• Properties of source codes	3	1	4

• Source compact coding using Tree and Huffman methods.	8	2	4
• Channel coding using: Hamming codes, cyclic codes, convolutional codes.	12	5	10
• Discrete information channels – channel capacity and entropy.	7	2	4
Total hours	**42**	**14**	**28**

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	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	1		1	1	1	1	1	1
	a3	1	1	1	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
Intellectual Skills	b1	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
	b4	1		1	1	1	1	1		1		1	1	1	1
	b5						1	1							1
	b6	1			1	1		1						1	
Applied Professional Skills	c1						1	1							1
	c2						1	1							1
	c3						1	1							1
	c4						1	1							1
	c5						1	1							1
	c6						1	1							1
	c7						1	1							1
	c8						1	1							1
General Tran. Skills	d1						1	1					1		
	d2						1	1	1	1				1	
	d3								1	1				1	

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7th Week	20
Semester Work	Quizzes	5th Week and 10th Week	10
	Reports and Tasks	5th Week, 8th Week and 12th Week	5
	Assignments	Weekly	5
	Remarkably achievements	13th Week	Bonus (5)
Practical Exam		15th week	20
Written Exam		16th week	40
Total			100

6- List of references:

6-1 Course notes

1-Communications (III) "Theoretical part"

2- Communications (III) "Practical part"

6-2 Required books

B.P. Lathi (2010), Modern Digital and Signal Communication Systems, Oxford, USA, ISBN: 978-0-19-538493-2

Bernard Sklar, (2001) Digital Communications Fundamentals and applications, 2nd Edition, Prentice Hall PTR

6-3 Recommended books

Simon Haykin (2001) "Communication Systems, 4th Edition, John Wiley & Sons, USA, ISSBN: 0-471-17869-1

6-4 Periodicals, Web sites, etc.

- En.m.wikibooks.org/wiki/A_Basic_Convolutional_Coding_Example
- http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-441-information-theory-spring-2010/lecture-notes/, Last accessed December 15, 2018
- https://mitpress.mit.edu/books/error-correcting-codes, Last accessed December 15, 2018
- http://jim*stone.staff.ac.uk/BookInfoTheoryBookMain.html, Last accessed December 15, 2018
- http://nptel.ac.in/noc/individual_course.php?id=noc17-ee17, Last accessed December 15, 2018

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. Shaimaa ElSayed Ibrahim
Head of the Department: Prof.Dr.Shouman S.E.I
Date: December 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELCN 423: Communications 4

A- Affiliation

Relevant program/s:	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:	December 2018

B - Basic Information

Title: Communications4 **Code:** ELCN423 **Level:** (4), Tenth Semester
Credit Hours: 4 **Pre-requisite:** ELCN 321
Contact Hours: **Lectures:** 3 **Tutorial:**1 **Laboratory:** 2 **Total:** 6

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the student to have good understanding of multiple access techniques and mobile communications. He should also be able to know the principles of satellite communication and digital hierarchical system and to know some problems facing the transfer of signals through the communication channel and its related solutions.

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- Modulation/multiplexing techniques suitable for different channel types (A27)
a4- 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, B5 ,B15)
b2- Design a digital hierarchical system. (B2, B5, 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. (C18, 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 and 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. (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, B5, B15, B18
C	Professional and Practical Skills	C15, C18, C19
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to signals and measurement of its essential bandwidth.	1	1	2
• Linear and nonlinear distortions	3	1	3
• Inter symbol interference and noise effects and related solutions	4	1	2
• Hierarchical systems and framing.	3	1	2
• Satellite orbits and orbital parameters.	1	1	2
• Basic transmission concepts.	2	1	2
• Link parameter and effect of noise.	3	1	2
• Satellite transponder and antenna.	3	1	2
• Multiple access and spread spectrum techniques.	6	1	2
• Spectral efficiency and measurements.	3	1	2
• Evaluation of mobile comm.	4	1	2
• GSM – structure and features.	4	1	2
• Cellular concepts and advanced.	2	1	1
• Procedures of mobile comm.	3	1	2
Total hours	**42**	**14**	**28**

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	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	1	
	a3	1		1		1					1	1	1	1	
	a4	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	
Applied Professional Skills	c1						1	1	1	1			1		1
	c2				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	1	

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7th Week	20
Semester Work	Quizzes	5th Week and 10th Week	10

	Reports and Tasks	5th Week, 8th Week and 12th Week	5
	Assignments	Weekly	5
	Remarkably achievements	13th Week	Bonus (5)
Practical Exam	15th week		20
Written Exam	16th week		40
Total			100

6- List of references:

6-1 Course notes

1- Communications -4 "Theoretical part"

2- Communications -4 "Practical part"

6-2 Required books

- B.P. Lathi (2010), Modern Digital and Signal Communication Systems, Oxford, USA, ISBN: 978-0-19-538493-2
- Theodore S. Rappaport (1996), Wireless Communications Principles and Practice, Prentice Hall, USA, ISBN: 0-13-375536-3
- Bernard Sklar, (2001) "Digital Communications Fundamentals and applications", 2nd Edition, Prentice Hall PTR
- Agarwal s.n. (2001), Satellite Communications, Khanna Publishers, India, ISBN: 81-7409-071-1

6-3 Recommended books

- Lajos Hanzo (2011), MIMO-OFDM for LTE, WiFi and WiMAX, Wiley, USA, , ISBN: 978-0-470-68669-0
- Simon Haykin (2001) "Communication Systems, 4th Edition, John Wiley & Sons, USA, ISSBN: 0-471-17869-1

6-4 Periodicals, Web sites, etc.

- www.ni.com/en-lb/innovations/wireless/software-defined-radio.html, Last accessed December 15, 2018

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer Lab. Installed with LabView program, with a network to connect between the computer devices and Advanced communications lab (for hardware experiments)

Course coordinator: Prof. Dr. Saeed Bayomy
Head of the Department: Prof.Dr.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 424: 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:	December, 2018

B - Basic information

Title: Radio and Television Engineering Systems	**Code:** ELCN 424	**Level:** 4, Ninth Semester		
Credit Hours: 4	**Pre-requisite**	ELCN211, ELCN 321		
Contact Hours:	**Lectures:** 3**:**	**Tutorial:**1	**Practical:** 2	**Total**: 6

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 signals 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- 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, C17)

c2-Design and estimation of the fundamental parameters of radio. (C15, C17)

c3- Carry out fault detection of TV- RX's, repair and operation test. (C19. C17)

d - General and transferable skills:

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

d1- Communicate effectively through assignments. (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, 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
• Introduction to needs for modulation.	1	1	2
• How radio system started and developed.	1	1	2
• Kinds of radio systems and comparison.	3	1	2
• Radio system design fundamentals	6	1	2
• Radio circuits design.	8	1	2
• Advantages of stereo system VS mono	1	1	2
• Structure stereo signal and system.	3	1	2
• The human eye response to colors.	3	1	2
• Prime colors and color mixing fundamentals	2	1	2
• Photometric measurements & color matrix.	3	1	2
• TV camera and construction of color signal.	3	1	2
• Scanning and synchronization.	3	1	2
• TV receiver structure and analysis.	3	1	2
• TV-tubes color picture demonstration.	2	1	2
Total hours	**42**	**14**	**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	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	

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	Week 5,10	6
	Assignment	Week 3,5,9,11	8
	Report	Week 12th	6
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
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 LabView program, with a network to connect between computer devices.
-

Course coordinator: Prof. Dr. Saeed Bayomy

Head of the Departmen: Prof.Dr.Shouman S.E.I

Date: December 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification

ELCN 425: 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: December 2018

B - Basic information

Title: Digital Signal Processing **Code:** ELCN 425 **Year/level:** 4th, Second semister
Credit Hours: 3 **Pre-requisite:** MATH 203, CMP 211
Contact Hours: **Lecturs:** 2 **Tutorial:**2 **Laboratory: 1** **Total:** 5

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	2	2	1
• Classification of signals	1	-	-
• The concept of frequency in continuous-time and discrete-time signals.	2	2	2
• Analog-to-digital and digital-to-analog conversion	1	2	-
• Discrete Fourier Transform (DFT) and its inverse	2	2	2
• Computational complexity of the DFT	4	2	2
• Correlation, cross-correlation, and convolution	4	4	2
• Z- transform and its inverse	4	4	1
• Properties of the Z-transform	2	-	-
• Application of Z-transform in DSP	2	4	2
• Design of the digital filters	-	4	1
• Types of the digital filters and choosing between them	2	-	-
• FIR filter design	2	2	1
• IIF filter design	2	2	1
Total	**30**	**30**	**15**

4 - Teaching and Learning and Assessement methods:

Course ILO's	Teaching Methods										Learning Methods				Assessement Method							
	Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Brain storming	Self Learning	Researches and Reports		Midterm	Quizes	Assignments	Written Exam	Practical Exam			
Un & 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:

Asesement Method	Timing	Grade (Degrees)
Semister Work: assignments, Quizes & Reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of References

6-1 Course Notes:

- Digital Signal Processing "*Theoretical and* "*Practical parts*"

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.
- DSP LAB.

Course coordinator:	Dr. Samir Kamal
Head of the Department:	Prof. Dr. Shouman S.E.I.
Date:	December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN 431: Optical Fiber Communications

A- Affiliation

Relevant program/s:	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:	December, 2018

B - Basic Information

Title: Optical Fiber Communications **Code:** ELCN 431 **Level:** (4), Ninth Semester

Credit Hours: 3 **Pre-requisite:** ELCN 324

Contact Hours: **Lectures:** 2 **Tutorial:**1 **Laboratory:** 2 **Total:** 5

C - Professional Information

1 – Course Learning Objectives:

The main objective of this course is to introduce the nature of optics and the physics as particles and waves, fundamentals of optical fiber communication, and light, laser semiconductor sources and 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
• Constituents of optical fiber communication system:	4	-	4
• Electromagnetic wave spectrum and blackbody radiation.			
• Power transfer evaluation throughout the system.			
• Radiometry of power quantities.			
• Concept of fiber optics as information channel:	6	2	4
• Dispersion in fiber optics and rate of data limitations.			
• Types of optical cables.			
• Methods of fabrication.			
• Optical components and integrated wave guide:	6	4	6
• Propagation and cavity resonators.			
• Optical couplers.			
• Light sources:	6	4	6
• Point and extended sources.			
• Blackbody sources.			
• LED and LD.			
• Spectrum of LD and LASER sources.			
• Light detectors and Noise generator in the detectors.	4	2	4
• System design and selection of individual components:	2	2	4
• Power budget and frequency budget.			
Total Hours	**28**	**14**	**28**

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	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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	5th and 10th week	10
	Assignment	weekly	5
	Reports	5th ,8thand 12th week	5
	Remarkably achievements	13th Week	Bonus (5)
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes

- Optical Fiber Communications "Theoretical Part"
- Optical Fiber Communications "Practical Part"

6-2 Required books

- Mishra Ugale (2013), Fiber Optic Communication Systems and Components, Wiley, USA, ISBN: 978-1-118-54673-4
- Gerd Keiser, (2000), Optical fiber Communications, P.B, Mc-Graw hill, USA, ISBN: 0-07-116468-5

6-3 Recommended books

- Roger L.Freeman, (2002), Fiber -Optic System for Telecommunications, Wiley, USA, ISBN: 0-471-41477-8
- Chin-lin Chem, (1996), Elements of Electronics & Fiber optics, Irwin, USA, ISBN: 0-07-114130-8

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 Departmen:	Prof.Dr.Shouman S.E.I
Date:	December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 432: 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: December, 2018

B - Basic information

Title: Microwave Circuit and Devices **Code:** ELCN 432 **Level:** (4), Tenth Semester
Credit Hours: 3 **Pre-requisite:** ELCN 324
Contact Hours: **Lectures:** 2 **Tutorial:**1 **Practical:** 2 **Total:** 5

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the basic concepts of microwave circuits and systems to enable the student to solve different microwave circuits. It include the fundamentals of:

- Impedance, admittance and scattering matrices for two-port, 3-port and 4-port networks.
- Microwave resonators, design of different types, and quality factors.
- Passive microwave devices (Coupler, Hybrid Junction, Attenuator, Power dividers etc.).
- Ferrite microwave devices (Isolator – Circulator) - Microwave amplifier and oscillator (Klystron – Magnetron).
- Microwave semiconductor devices (PIN diode – Varactor – Negative resistance Diodes).
- Microwave integrated circuits (Hybrid – Monolithic).

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- 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
• Impedance, admittance and scattering matrices for two-port, 3-port and 4-port networks.	6	3	3
• Microwave resonators, design of different types, quality factors.	4	2	2
• Passive microwave devices (Coupler – Hybrid Junction – Attenuator – Power dividers etc).	4	2	4
• Ferrite microwave devices (Isolator – Circulator).	4	2	-
• Microwave amplifier and oscillator (Klystron – Magnetron).	4	2	2
• Microwave semiconductor devices (PIN diode – Varactor – Negative resistance Diodes).	4	2	3
• Microwave integrated circuits (Hybrid – Monolithic).	2	1	-
Total hours	**28**	**14**	**14**

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)
Mid-Term Exam		7th Week	20
Semester Work	Quizzes	5th and 10th Week	6
	Assignment	3rd,5th ,9th and 11th Week	8
	One Report	12th Week	6
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
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

Pozar, D. M. (2005) ***Microwave Engineering***, USA, John Wiley & sons, Inc.

6-3 Recommended books

Collin, R. E (1992) ***Foundations for Microwave Engineering,*** Second edition, N.Y, Mc Graw Hill.

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. Mokhtar Abd El- Haleem*
Head of the Department: Prof.Dr.Shouman S.E.I
Date: *December, 2018*

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 433: Communications Networks "*Elective 6"*

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 and Communication Technology Department.
Date of specifications approval:	December, 2018

B - Basic information

Title: Communications Networks **Code:** ELCN 433 **Level: (4**), Tenth Semester
Credit Hours: 3 **Pre-requisite:** ELCN 321
Contact Hours: **Lectures:** 2 **Tutorial:** 2 **Practical:** - **Total: 4**

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to introduce famous applications for communication networks, especially computer networks, after quick review of multiplexing techniques and its relationship with these applications. Also, in this course, computer networks two protocols models; OSI and TCP/IP will be displayed in details in addition to different techniques for switching, routing, and flow control processes.

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. (A18, A27, A28)
a2- Basic network devices, architecture, topologies and interfaces. (A18, A22, A27)
a3- Properties of communication channels, and how to increase its utilization efficiency by applying multiplexing techniques (A18, A22, A27)
a4- Error control mechanisms, the concept of parity and forward error correction (A19)
a5- How to ensure the security of networked data using state of the art mechanisms (A17, A18).
a6- The state of art network design techniques, and factors that should be taken into consideration to minimize cost and maximize reliability. (A4, A5, A18, A27)
a8- The structure of the Internet, its history, evolution and how packets are routed within this enormous network (A19, 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, B15, B18)
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. (B2, B15, B18)
b3- Apply the principles of data communication and communication network techniques to design and evaluate new protocols. (B2, B15, B18)
b4- Encode/decode short segments of data and correct erroneous bits (B2, B15, B18)
b5- Analyze a given network and measure its worst-case routing delay (B2, B15, B18)

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. (C5, C12, C14)

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 (C5, C12, C14)

c3-Write several technical reports that describe all aspects of his design, his simulated results and compare it to theoretically predicted results. (C5, C12, C14)

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 to finish required group assignments within required timeline. (D3)

d2- Search for the solution of the assigned problems in assignments by referring to relevant publications such as text books and research papers. (D6)

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. (D3, D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A4, A5, A18, A19, A22, A27, A28
B	Intellectual skills	B2, B15, B18
C	Professional and practical skills	C5, C12, C14
D	General and transferable skills	D3, D6, D7

3- Contents:

Topics	Lecture hours	Tutorial hours
• Transmission Principles and Media.	2	2
• Data Encoding and Channel Capacity.	3	3
• Interface Standards.	2	2
• Multiplexing Techniques: TDM, FDM, and CDMA.	2	2
• Modem Standards And Modulation Techniques.	3	3
• Error and Line Control Techniques.	3	3
• FEC Techniques.	3	3
• OSI Model	2	2
• TCP/ IP Model	2	2
• IP Subnetting	2	2
• Network Switching	2	2
• Network Routing	2	2
Total hours	**28**	**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	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)
Mid-Term Exam		7th Week	20
Semester Work	Quizzes	5th and 10th Week	6
	Assignment	3rd,5th ,9th and 11th Week	8
	One Report	12th Week	6
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes

Nelly M. Hussein, Communications Network.

6-2 Required books

Behronz A. Foronzan, ***Data communication & Networking***", 3rd Edition, MC Graw Hill, 2003.

6-3 Recommended books

William Stallings, DATA AND COMPUTER COMMUNICATIONS, 8th Edition, Person Printec Hall,
Leon-Garia, ***Communication Network***, 2nd Edition Wijaja, MC Graw Hill, 2000.

6-4 Recommended Web Site

- https://en.wikipedia.org/wiki/Telecommunications_network
- https://netcad

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.Shouman S.E.I
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 434: Mobile communication "*Elective 6"*

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:	December, 2018

B - Basic information

Title: Mobile communication **Code:** ELCN 434 **level:** (4), Tenth Semester
Credit Hours: 3 **Lectures:**2 **Tutorial:**2 **Practical:** - **Total**: 4
Pre-requisite: ELCN 321

C - Professional information

1 – Course Learning Objectives:

A study of this course will enable the student to understand economical aspects of mobile communication and understand the basic concept of cellular system and basic cellular system architecture. Various multiple access techniques will be displayed also in this course and their relationship with mobile generations; from 1G to 4G. In addition, concept of radio planning and wireless digital transmission problems will be handled in this course in addition of near far problem, power control, and 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- Progress of mobile generations beginning from 1G leading to 4G. (A18, A27, A28)
a2- The cellular concept of mobile system. (A18, A27, A28)
a3- Basics and architecture of Global System for Mobile GSM. (A18, A27, A28)
a4- Effect of multipath fading on wireless digital transmission. (A18, A27, A28)
a5- Principles of spread spectrum especially CDMA technique. (A18, A27, A28)
a6- How 4G could overcome fading distortion. (A18, A27, A28)

b - Intellectual skills:

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

b1- plan any mobile covered area with cellular concept. (B17, B18)
b2- Determine frequency range corresponding to each mobile generation. (B18, B19)
b3- Choose the suitable locations for each item of GSM network architecture. (B15, B18)
b4- Determine suitable frequency rues gain. (B14)

c - Professional and practical skills:

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

c1- Find optimum cellular distribution for mobile network given specific region parameters. (C2, C7)
c2- Calculate received power at different points of the area covered by mobile network. (C2, C7)
c3- Find estimated QOS factor and BER based on a specific communications system parameters. (C2, C7)

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. (D6, D7)

d2- Incorporate the knowledge of the course topics in an integrated student project (D6, D9)

d3- Search for information in internet. (D3, D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A18, A27, A28
B	Intellectual skills	B14, B17, B18, B19
C	Professional and practical skills	C2, C7
D	General and transferable skills	D3, D6, D7, D9

3 – Contents

Topics	Lecture hours	Tutorial hours
• Overview of mobile generations and multiple access techniques	2	2
• GSM concept, channels, and cellular system.	3	3
• Spectrum efficiency and capacity increasing	2	2
• GSM architecture	6	6
• Traffic and control channels	2	2
• Types of interference in GSM	3	3
• UMTS / WCDMA and spreading operation	2	4
• QOS support and power control	2	2
• Diversity in UMTS	2	2
• Multicarrier technology and OFDM	2	2
• Revolution of 4G	2	2
Total hours	**28**	**28**

4 - Teaching and Learning 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	-
	a3	1	1	1		1	-				1			1	-
	a4	1		1			-	1				1	1	1	-
	a5	1	1	1	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	1		1	1	-
	b3	1			1		-						1	1	-
	b4	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					-						1		-
	d3		1	1			-						1		-

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	Week 5,10	6
	Assignments	Week 3,5,9,11	8
	Reports	Week 12th	6
Practical Exam		fourteenth week	20
Written Exam		Fifteenth week	40
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, 2nd edition 1994

6-3 Recommended books:

Jochen Schiller, Mobile Communications, 2nd Edition, Pearson Education Limited 2003.

6-4 Periodicals, Web sites, etc.

https://www.tutorialspoint.com/wireless_communication/wireless_communication_multiple_access.html

7- Facilities required for teaching and learning:

- Data show, white board

Course coordinator:	Dr. Nelly Muhammad Hussein
Head of the Department:	Prof.Dr.Shouman S.E.I
Date:	December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 435: Modern Telephone Central Office

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:	December, 2018

B - Basic information

Title: Modern Telephone Central Office Code: ELCN435 **Level:** (4(, Tenth Semester
Credit Hours: 3 **Pre-requisite:** ELCN 215
Contact Hours: **Lectures:** 2 **Tutorial:**1 **Practical:** 2 **Total:** 5

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the basic concepts of:

- Telephone system elements.
- Technological trends in telephone instruments.
- Station apparatus.-Transmission media.-Transmission capabilities.
- Four- wire- to – two wire conversion.-Telephone network switching.
- Space- division switching.-Time- division switching.
- Electronic switching systems.-Manual exchange signaling.
- Subscriber- loop signaling.-Local- loop signaling design.
- Message and packet switching.- ISDN.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Telephone system elements.. (A20)
a2- Technological trends in telephone instruments . (A15)
a3- Station apparatus.-Transmission media.-Transmission capabilities . (A15)
a4- Four- wire- to – two wire conversion.-Telephone network switching. (A15)
a5- Space- division switching.-Time- division switching. (A15)
a6- Electronic switching systems.-Manual exchange signaling. (A15)
a7- Subscriber- loop signaling.-Local- loop signaling design. (A15)
a8- Message and packet switching.- ISDN.. (A15)

b - Intellectual skills:

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

b1- Deduce the difference between the different telephone systems. (B16)
b2- Investigate the different technological trends in telephone instruments. (B16)
b3- Identify the main components of different telephone networks. (B16)
b4- Judge the different types of switching techniques. (B17)

c - Professional and practical skills:

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

c1- Design and construct the different telephone systems. (C15)

c2- Investigate the performance of the typical telephone techniques. (C15)

c3- Analyze the performance of the different telephone networks . (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. (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
D	General and transferable skills	D7, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
• Telephone system elements.	4	2	4
• Technological trends in telephone instruments.	4	2	4
• Station apparatus.-Transmission media.-Transmission capabilities.	4	2	4
• Four- wire- to – two wire conversion.-Telephone network switching..	4	2	4
• Space- division switching.-Time- division switching.	4	2	4
• Electronic switching systems.-Manual exchange signaling	4	2	4
• Subscriber- loop signaling.-Local- loop signaling design. - Message and packet switching.- ISDN.	4	2	4
Total hours	**28**	**14**	**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	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	
Applied Professional Skills	c1	1		1										1	
	c2	1		1		1								1	1
	c3	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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	Week 5,10	6
	Assignments	Week 3,5,9,11	8
	Reports	Week 12th	6
Practical Exam		fourteenth week	20
Written Exam		Fifteenth week	40
Total			100

6- List of references:

6-1 Course notes

1- Modern Telephone Central Office "*Theoretical part*"

2- Modern Telephone Central Office "*Practical part*"

6-2 Required books:

Gokhale, **A. A. (**2001), Introduction to Telecommunications, First edition, Delmar Thomson Learning, USA.

6-3 Recommended books

Moultion, P and Moultion, J. (2000) The Communications, Survival Guide, Second edition, Prentice Hall, USA.

6-4 Web sites:

www.telephoneresearch.com
www.telephonelineinc.com

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Telephone central office lab.

Course coordinator:	Prof. Ibrahim Amin
Head of the Department:	Prof.Dr.Shouman S.E.I
Date:	*December, 2018*

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 436: Advanced Microwave Measurements

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:	December, 2018

B - Basic information

Title: Microwave Circuit and Devices **Code:** ELCN 436 **Level:** (4), Tenth Semester
Credit Hours: 3 **Pre-requisite:** ELCN 324
Contact Hours: **Lectures:** 2 **Tutorial:**- **Practical:** 2 **Total:** 4

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the basic concepts of:

- Recent advances in microwave frequency measurements.
- Microwave power measurements. - Thermidtor mounts bridges, thermocouple sensors and diode detectors.
- Mismatch errors and total uncertainty.
- High frequency swept measurements.
- Reflect meter and slotted – line impedance measurements.
- Spectrum analyzer measurements (AM&FM signals – pulsed RF …. Etc.)
- Receiver response measurements.
- Network analyzer transmission and reflection measurements.
- Return loss, insertion loss and impedance measurements using network analyzers.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Conventional and advanced microwave measurements. (A20)
a2- Microwave power measurements. - Thermidtor mounts bridges, thermocouple sensors and diode detectors. . (A15)
a3- Mismatch errors and total uncertainty (A15)
a4- High frequency swept measurements. (A15)
a5- Reflect meter and slotted – line impedance measurements. (A15)
a6- Receiver response measurements. (A15)
a7- Network analyzer transmission and reflection measurements. (A15)
a8- Return loss, insertion loss and impedance measurements using network analyzers . (A15)

b - Intellectual skills:

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

b1- Deduce the difference between the conventional and advanced microwave measurements. (B16)
b2- Investigate the critical parameters in microwave power measurements. (B16)
b3- Identify the different errors and losses occurred within the microwave measurements.. (B16)
b4- Judge the measured results in comparison with the ideal cases. (B17)

c - Professional and practical skills:
On successful completion of the course, the student should be able to:
c1- Design and construct the equipment and tools suitable for the intended microwave measurements. (C15)
c2- Investigate the performance of the typical microwave measuring schemes. (C15)
c3- Analyze the measuring results. (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. (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
D	General and transferable skills	D7, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
• Recent advances in microwave frequency measurements.	6	-	6
• Microwave power measurements. - Thermidtor mounts bridges, thermocouple sensors and diode detectors.	4	-	4
• Mismatch errors and total uncertainty and high frequency swept measurements.	4	-	4
• Reflect meter and slotted – line impedance measurements.	4	-	4
• Spectrum analyzer measurements (AM&FM signals – pulsed RF …. etc.).	4	-	4
• Network analyzer transmission and reflection measurements. (A15)	4	-	4
• Return loss, insertion loss and impedance measurements using network analyzers	2	-	2
Total hours	**28**	**-**	**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	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	
Applied Professional Skills	c1	1		1										1	
	c2	1		1		1								1	1
	c3	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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	Week 5,10	6
	Assignment	Week 3,5,9,11	8
	Report	Week 12th	6
Practical Exam		fourteenth week	20
Written Exam		Fifteenth week	40
Total			100

6- List of references:

6-1 Course notes

1- Advanced Microwave Measurements "*Theoretical part*"

2- Advanced Microwave Measurements "*Practical part*"

6-2 Required books:

Behari J. (2003) Microwave Measurements Technique & applications, Anamaya publishers. USA.

6-3 Recommended books

Laverghetta, T. S. (1989) Modern microwave Measurements and Techniques, Artec. House, USA

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.
- Microwave measurement lab.

Course coordinator:	Prof. Mokhtar Abd El- Haleem
Head of the Department:	Prof.Dr.Shouman S.E.I
Date:	December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
ELCN437: Satellite Communication

Affiliation:	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:	December, 2018

B – Basic information:

Title: Antennas and Wave Propagation **Code:** ELCN437 **Level:** (4), Tenth Semester
Credit Hours: 3 **Pre-requisite**: ELCN321
Contact Hours: **Lectures:** 3 **Tutorial:** 1 **Laboratory:** 2 **Total: 5**

1 – Course Learning Objectives:

A study of this course will enable the student to understand the Satellite importance - Basic Satellite System - Mobile Satellite System - Direct Broadcast System - Satellite Orbits, laws governing - Satellite Motion, Satellite Path in Space Geostationary Satellites, Launching of Geostationary Satellites - Frequency and Propagation Considerations - Communication Link Design - Antenna Basics - Transmission Equation - Noise Considerations - Link Design - Modulation and Coding. Multiple Access Techniques FDMA, TDMA, CDMA -Communication Satellite and Earth Stations.

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 importanace - Basic Satellite System - Mobile Satellite System - Direct Broadcast System (A1, A18).
a2- Definition and physical concepts of Satellite Orbits, laws governing - Satellite Motion, Satellite Path in Space Geostationary Satellites, launching of Geostationary Satellites (A1)
a3- knowledge of Frequency and Propagation Considerations - Communication Link Design (A1 , A19)
a4- Antenna Basics - Transmission Equation - Noise Considerations - Link Design - (A1, A21)
a5- Modulation and Coding. Multiple Access Techniques FDMA, TDMA, CDMA -Communication Satellite and Earth Stations. (A1 ,A19)

b - Intellectual skills:

On successful completion of the course, the student should be able to:
b1- Know the basic architecture of the satellite systems. (B2, B5)
b2- Operation of the different sub systems. (B15, B17)
b3- Predict the characteristics and performance of different satellite sub systems .(B18, 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 (C2,C18)
c2- Array antenna design for required performance (C2, C19)
c3- Measurement radiation patterns of different types of antennas analyses and report in antenna parameters.(C5, C118,C19)

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 (D1, D6)
d2) Practical measurements in antenna lab (D1,D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A18, A19, A21
B	Intellectual skills	B2, B5,,B17, B19
C	Professional and practical skills	C2, C5, C18, C19
D	General and transferable skills	D1, D6

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
• Satellite Introduction - Basic Satellite System - Mobile Satellite System - Direct Broadcast System	8	-	2
• Satellite Orbits, laws governing - Satellite Motion, Satellite Path in Space	8	4	2
• Geostationary Satellites, Launching of Geostationary Satellites	4	2	4
• Frequency and Propagation Considerations - Communication Link Design	8	2	4
• Antenna Basics - Transmission Equation - Noise Considerations - Link Design - Modulation and Coding.	6	3	8
• Multiple Access Techniques FDMA, TDMA, CDMA - Communication Satellite and Earth Stations.	8	3	8
Total Hours	42	14	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	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	a2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	a3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	a4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	a5	1	1	1	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	1
	b2	1		1	1	1		1	1	1	1	1	1	1	1
	b3	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
	c2	1		1	1	1		1			1	1	1	1	1
	c3	1		1	1	1		1			1	1	1	1	1
General Tran. Skills	d1	1	1	1											1
	d2	1	1	1											1

5- Assessment Timing and Grading

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	Week 5,10	6
	Assignments	Week 3,5,9,11	8
	Reports	Week 12th	6
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes

1- Satellite communication "Theoretical part"

2- Satellite communication "Practical part"

6-2 Required books

Maral, G., Bousquet, M (2002) Satellite Communication System, 4th Edition, N.Y.

6-3 Recommended books

Richharia (1995) Satellite communications Systems Design Principles, N.Y, Macmillan New Electronics.

6-4 Periodicals, Web sites, etc.

- http://www. Satellite communication .com
- NPTEL: Electronics & Communication Engineering Satellite communication
- http://nptel.ac.in/courses/117107035/

7- Facilities required for teaching and learning:

Computer lab installed by MATLAB software.

Course coordinator:	Prof. Dr. Ibrahim Amin Ibrahim
Head of the Department:	Prof. Dr. Shouman S.E.I
Date:	December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN438: Acoustics

Affiliation:	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:	December, 2018

B – Basic information:

Title: Antennas and Wave Propagation **Code:** ELCN438 **Level:** (4), Tenth Semester
Credit Hours: 3 **Pre-requisite**: None
Contact Hours: **Lectures:** 2 **Tutorial:** 1 **Laboratory:** 2 **Total: 5**

1 – Course Learning Objectives:

The study of this course will enable the student to understand the basic principles of sound and fundamentals of Acoustics. Sound Wave Propagation and Characteristics, Reflections in Enclosed Spaces and Absorption - Electro-Acoustic Circuits and Acoustic Transducers - Acoustics of the Audio Room, Control Room and Small Recording Studio - Recording and Acoustical Distortion, Room Optimizer - Frequency Selectivity of Audio System and speech processing.

2 - Intended Learning Outcomes ILOs

a - Knowledge and understanding

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

a1- Sound and fundamentals of acoustics (A1, A3) .
a2-Sound wave propagation and characteristics (A1, A8).
a2- Electro-acoustic circuits and acoustic transducers (A19,A24).
a4-Reflections in Enclosed spaces and absorption. (A3,A19).
a5- Acoustics of the audio room, control room and small recording studio (A1 , A8, A19)

b - Intellectual skills:

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

b1- Estimate recording and acoustical distortion, room optimizer (B2, B3)
b2- Calculate frequency selectivity of audio system and speech processing. (B2, B4)
b3- Evaluate the characteristics and performance of different acoustic systems .(B2,B3,B4)

c - Professional and practical skills:

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

c1- Choose the main features of the required acoustical system (C3,C5,C15).
c2- required performance (C3,C5,C15).
c3- Evaluate the characteristics and performance of selected acoustical system. (C3,C5,C15).

d - General and transferable skills:

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

d1) Solutions of problem sets and assignments (D1,D2).

d2) Practical measurements in acoustics lab (D1,D2).

3- Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A18, A19, A21
B	Intellectual skills	B2, B5,,B17, B19
C	Professional and practical skills	C2, C5, C18, C19
D	General and transferable skills	D1, D6

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	1	1
	a2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	a3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	a4	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	a5	1	1	1	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	1
	b2	1		1	1	1		1	1	1	1	1	1	1	1
	b3	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
	c2	1		1	1	1		1			1	1	1	1	1
	c3	1		1	1	1		1			1	1	1	1	1
General Tran. Skills	d1	1	1	1											1
	d2	1	1	1											1

5- Assessment Timing and Grading

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	2 quizzes	Week 5,10	6
	4 assignment	Week 3,5,9,11	8
	One Report	Week 12th	6
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes

1- Acoustics "Theoretical part"

2- Acoustics "Practical part"

6-2 Required books

Alton, E. F. (2001) The Master handbook of Acoustics, McGraw Hill.

Raichel, D. R. (2006) The Science and Application of Acoustics, Second Edition, Springer.

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.

- http://www.Acoustics.com/ NPTEL:
- Electronics & Communication Engineering - Acoustics
- http://nptel.ac.in/Acoustics courses/117107035/

7- Facilities required for teaching and learning:

Computer lab installed by MATLAB software.

Course coordinator: Prof. Ibrahim Amin Ibrahim
Head of the Department: Prof. Shouman, E. I. S
Date: December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 439: Computer Controlled Systems and Applications to 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:	December, 2018

B - Basic information

Title: Modern Telephone Central Office Code: ELCN439 **Level:** (4), Tenth Semester
Credit Hours: 3 **Pre-requisite:** CMPN210, ELCN210
Contact Hours: **Lectures:** 2 **Tutorial:**3 **Practical:** 0 **Total:** 5

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce the basic concepts of:
- The different Computer Controlled Systems used for communication.
- Stability and robustness.
- Synthesis methods for scalar systems, case study: DVD focus control.
- Sampling process and Discrete time models, Z- transform.
- State feedback and observers in discrete time from analog to digital design.
- Digital controller implementation.
- Synthesis for multivariable systems.
- Stochastic disturbances, LQ synthesis, LQG. Kalman filtering. LQG.

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 Computer Controlled Systems used for communication. (A20)
a2- Analyzing methods for stability and robustness. (A15)
a3- Synthesis methods for scalar systems. (A15)
a4- Sampling process and Discrete time models, Z- transform. (A15)
a5- State feedback and observers in discrete time from analog to digital design. (A15)
a6- Digital controller implementation. (A15)
a7- Synthesis for multivariable systems. (A15)
a8- Stochastic disturbances, LQ synthesis, LQG. Kalman filtering. LQG. (A15)

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Deduce the difference between the different Computer Controlled Systems used for communication. (B16)
b2- Investigate the different analyzing and synthesis procedures. (B16)
b3- Identify the different types of sampling techniques and transformations. (B16)
b4- Discriminate the advantages and disadvantages of the different types of controllers. (B17)

c - Professional and practical skills:

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

c1- Design and construct the different computer control systems. (C15)

c2- Investigate the performance of the typical computer control systems. (C15)

c3- Judge the capabilities of the different controllers. (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. (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
D	General and transferable skills	D7, D9

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1- The different Computer Controlled Systems used for communication.	4	6	-
2- Analyzing methods for stability and robustness.	4	6	-
3- Synthesis methods for scalar systems	4	6	-
4- Sampling process and Discrete time models, Z- transform.	4	6	-
5- State feedback and observers in discrete time from analog to digital design.	4	6	-
6- Digital controller implementation, Synthesis for multivariable systems	4	6	-
7- Stochastic disturbances, LQ synthesis, LQG. Kalman filtering. LQG. (A15)	4	6	-
Total hours	**28**	**42**	**-**

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	
Applied Professional Skills	c1	1		1										1	
	c2	1		1		1								1	1
	c3	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)
Mid-Term Exam		7-th Week	20
Semester Work	2 quizzes	Week 5,10	12
	4 assignment	Week 3,5,9,11	16
	One Report	Week 12th	12
Practical Exam		fourteenth week	-
Written Exam		Fifteenth week	40
Total			100

6- List of references:

6-1 Course notes

1- Computer controlled and Applications to Communication "*Theoretical part*"

2- Computer controlled and Applications to Communication "*Practical part*"

6-2 Required books:

Grewal, M. S. (2001), Global Positioning Systems, Inertial Navigation and Integration, 2nd Edition, A John Wiley & Sons, Inc. Publication, **USA**

6-3 Recommended books

Rogers, R. M. (2003) Applied Mathematics in Integrated Navigation Systems, 2nd Edition, AIAA Education Series, USA.

6-4 Web sites:

www. Global Positioning Systems research.com
www. Inertial Navigation lineinc.com

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Computer lab. With different software programs as MATLAB.

Course coordinator:	Prof. Ibrahim Amin
Head of the Department:	Prof. Shouman, E.I. Shouman
Date:	December, 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification

ELCN 460: Project-2a

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:	December, 2018

B - Basic information

Title: Project-2a **Code:** ELCN 460 **Level:** (4), Ninth Semester
Credit Hours: 6 **Lectures:** 2 **Tutorial:**1 **Practical:** 8
Contact Hours: **Pre-requisite:** ELCN 361

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	16
First semester design of products using market existing and designed components by majority of the students	10	5	40
Writing of the final report and the presentation of the project.	4	3	16
Total hours	**28**	**14**	**112**

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 assignments and reports	Bi-Weekly	20
	Attendance and group work	Bi-Weekly	20
	Practical work and discussions	Bi-Weekly	20
Written report and final Exam		End of first term	40
Total			**100**

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.Shouman S.E.I
Date:	December 2018

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELCN461: Project-2b

A- Affiliation

Relevant program/s:	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:	December 2018

B - Basic Information

Title: Prroject-2b **Code:** ELCN461 **Level:** (4), Tenth Semester
Credit Hours: 3 **Pre-requisite:** ELCN460
Contact Hours: **Lectures:** 2 **Tutorial:-** **Laboratory:** 2 **Total:** 4

1 – Course Learning Objectives:

By the end of this course the students should be understanding the requirements for developing modern Telecommunication Systems, Analysis and design project requirements, Projecting possible solutions and anticipated applications, the implementation of practical design, Appreciating project economy, Making needed measurements, Writing complete report and conclusions.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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, A5,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

Topic	Lecture hours	Tutorial hours	Practical hours
1-.Second semester Design and analysis of each part for the project allocated to each student with close cooperation with partners in the team	6	-	6
2- Presentation sessions for each part of the project designing.	6	-	6
3- Second semester major implementations and practical demonstrations attended by majority of the students.	10	-	10
4- Writing of the final report and the presentation of the project.	6	-	6
Total hours	**28**	**-**	**28**

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	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
	a3		1	1	1	1		1	1			1	1		1
	a4	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	1			1		1
	a8	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		
	b3	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
Applied Professional Skills	c1	1	1	1	1	1		1		1			1		1
	c2					1		1		1			1		
	c3		1	1	1	1		1		1			1		
	c4	1			1			1		1			1		
General Tran. Skills	d1	1	1		1	1	1	1		1			1		
	d2		1	1	1	1	1	1	1	1			1		
	d3		1	1		1		1		1			1		
	d4		1			1		1		1		1	1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes	Bi-Weekly	10
Attendance and group work	Bi-Weekly	10
Practical work and discussions	Bi-Weekly	20
Written report and final Exam	End of second term	60
Total		**100**

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

6-4 Periodicals, Web sites, etc.

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 ARDUIN

Course coordinator: Dr. Sara Mohammed Hassan

Head of the Department: Prof.Dr.Shouman S.E.I

Date: February 2019

Modern Academy
for Engineering and Technology in Maadi

Course Specification
CMPN010: 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: Architecture Engineering and Building Technology Department.
Electronic Engineering and Communications Technology Department
Computer Engineering and Information Technology Department
Manufacturing Engineering and Production Technology Department

Department offering the course: Computer Engineering and Information Technology Department

Date of specifications approval: December 2018

B - Basic information

Title: Program Design and Computer Languages
Code: CMPN010
Year/level: Freshman - Fall, Spring and Summer Semesters
Credit Hours: 4
Lectures: 2
Tutorial: 3
Practical: 2
Total: 7
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- Analyse 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, C 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, A2, 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**	**Tutorial**	**Practical**

	hours	hours	hours
➢ Steps for solving programs by computer programs	2	2	2
➢ Program documentation and flow charts	2	2	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	2	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)	1	2	1
➢ Classes and objects	1	2	1
➢ 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	**28**	**42**	**28**

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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	8
	Reports	Two reports per semester	4
	Assignments	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references

6-1 Course notes:

Lecture notes and handouts

6-2 Required books:

Walter Savitch, (2006) Problem Solving with C++, Pearson Education Inc.
Deitel & Deitel, (2001) C++ How to program, Prentice Hall.
Al Stevens, (2000) C++ Programming Bible, IDG.

6-3 Recommended books:

C++ Essentials, Sharam Hekmat, (2005) Programming Soft Corporation,www.pragsoft.com,

6-4 Periodicals, Web sites, etc.:

http://www.cplusplus.com/.

7- Facilities required for teaching and learning:
Computer Lab.

Course coordinator: Dr. Ehab ElShimy
Head of the Department: A. Prof. Dr. Wafaa Boghdady
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification Course Specification
CMPN110: 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: Computer Engineering and Information Technology Department
Electronic Engineering and Communications Technology Department

Department offering the course: Computer Engineering and Information Technology Department

Date of specifications approval: December 2018

B - Basic information

Title: Data Structures and Algorithms

Code: CMPN110 **Level:** Sophomore, Second Semester

Credit Hours: 3

Lectures: 2 **Tutorial/Exercise**: 2 **Practical:** **Total:**4

Pre-requisite: CMPN010

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 (C1, C2, C5).

c2- Join the allocated topics with topics of the compiler subject to achieve an optimum compiler design (C1, C2, C3, C6).

c3- Use the given topics to measure program efficiency (C1, C5, C6).

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, A2, A3, A4, A5, A9, A12, A16,A18
B	Intellectual skills	B1, B2, B4, B8, B12, B14, B17, B18
C	Professional and practical skills	C1, C2, C3, C5, C6
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.	4	4	-
• Traversing and searching linked lists for sorted and unsorted linked			
• Insertion and definition algorithms.			
• Two-way lists.			
➢ Trees			
• Basic definitions and structure.			
• Representation of binary trees in memory.			
• Linked representation.			
• String array representation.	7	8	-
• Terminating binary sequence (TBS) representation.			
• Transformation of a general tree into binary tree.			
• Transferring tree and transversal algorithms using stacks (Preorder,			
• Threads and in order threading.			
• Path length and Huffman's tree achieving using Huffman's			
➢ Searching			
• Introduction and searching types.			
• Scanning.			
• Direct scanning and controlled scanning.			
• Binary search algorithms.	4	5	-
• 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	28	28	-

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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	16
	Reports	Two reports per semester	14
	Assignments	Bi-Weekly	10
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

- Data structures theory & Algorithms.

6-2 Required books

Micheal Main and Water Savitch, (1995),Data Structure and other Objects, Benjamine/Cummings, CA
Adam Drozdek,(2012.), Data Structure and Algorithms in C++, Cengage Learning , 4th edition

6-3 Recommended books:

- 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: Dr. Khaled Morsy
Head of the Department: Ass. Prof. Dr. Wafaa Boghdady
Date: December 2018

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Modern Academy
for Engineering and Technology in Maadi

Course Specification
CMPN111: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 Communications Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Computer Engineering and Information Technology Department

Date of specifications approval: December 2018.

B - Basic information

Title: Logic Design-1 **Code:** CMPN111 **Level:** Sophomore, First Semester

Credit Hours: 4 **Lectures:**3 **Tutorial/Exercise:**2 **Practical:**1 **Total**:6

Pre-requisite: MTHN 001

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, A2, 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	D1,D2,D3, D4, D5, D6, D7, D9

3 – Contents

	Topic	Lecture hours	Tutorial hours	Practical hours
1	Introduction	3	-	1
	• Basic Definitions.			
	• Laws of Boolean algebra.			
2	Logic Functions Representation & Realization	2	1	2
	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	2	
	• Matching logic functions with gate systems.			

3	Logic function minimization	2	-	1
	• Using basic laws of Boolean.	1		
	• Using karnaugh map minimization.	1	-	1
	• Using Quine-Mc Clusky's Methods.	1		
	• Minimization of multiple-output Logic Functions.	1	-	1
4	Combinational logic modules	2	2	1
	• Half and full adders, Parallel adder connection, look ahead carry.			
5	Decoders and de-multiplexers	1	2	-
6	Encoders	1		
7	Data selectors (multiplexers)	1		
	• Parity checkers.	1	4	1
	• Read only memories.	2		
	• Binary comparators.	2		
8	Sequential logic circuit elements	2	2	1
	• State diagram and state table representation of sequential circuits.			
9	Asynchronous and synchronous sequential elements	2	3	1
	• S-R Flip-Flop, and J-K Flip Flop.			
	• D Flip-Flop, and T Flip Flop.	2	3	1
	• Racing in sequential circuits.	1		-
	• Master-slave and Edge-triggered Flip-Flops.	2	2	-
10	Sequential logic circuit modules	1		-
	• Introduction.			
	• Registers and shift registers	2	1	1
	• Asynchronous and synchronous counters	3	2	1
	• Counter using shift-registers (Johnson and ring counters)	2	1	
	• Random access memories (basic cell, addressing and read-write operations)	3	3	1
	Total hours	**42**	**28**	**14**

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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	16
	Reports	Two reports per semester	14
	Assignments	Bi-Weekly	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Digital logic circuit (Theoretical + Practical).

6-2 Required books:

Sanjay (2012) Analog and Digital Electronics

Mano, M.M, and Kime, C.R, (2014) Logic and Computer Design Fundamental", 4TH ed., Pearson.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

- http://www.prenhall.com/mano.
- http://opencourses.emu.edu.tr/

7- Facilities required for teaching and learning: None.

Course coordinator: Ass. Prof. Dr. Wafaa Boghdady
Head of the Department: Ass. Prof. Dr. Wafaa Boghdady
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
CMPN 210: 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 Communications Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Computer Engineering and Information Technology Department

Date of specifications approval: December 2018

B - Basic information

Title: Engineering Computer Applications **Code**: CMPN 210 **Year/level:** Junior , First Semester

Credit Hours: 3 **Lectures**: 2 **Tutorial**:1 **Practical**: 2 **Total:**5

Pre-requisite: CMPN 010

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- Analyse 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, A2, A5, A8,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		
➢ Mat lab 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	2		4
➢ Computer Application using MATLAB-Mathematical Models of systems	2	1	2
➢ Introduction to Simulink	3	1	3
➢ Seminar	1		1
Total hours	28	14	28

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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	8
	Reports	Two reports per semester	4
	Assignments	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

Lecture notes and handouts

Laboratory work printed notes

6-2 Required books

Digitalfilters &signal rocessing with matlab

Munther (2013), Matlab by example programming basic.

luis f.chapore (2011), signals and systems using matlab, academic press

sanjay, (2011), digital signal processing with matlab program, korson

luis f.chapore (2004), MATLAB AN INTRODUCTION WITH APPLICATIONS, WILEY

dean g.duffy (2003), advanced engineering mathematics with matlab, chapman&hall

6-3 Recommended books:

D. Hanselman and B. Littlefield (2005), Mastering MATLAB7, Prentice Hall,

David C. Kuncicky (2004).,Matlab Programming, Pearson Prentice Hall ,

Amos Giltat, (2004),Matlab An Introduction with Applications", John Wiley.

Thomas K., Jewelly, (1990)Computer Applications for Engineers, Prentice Hall,.

Jaan Kiusalaas (2010)Numerical Methods in Engineering with MATLAB, Cambridge University Press,.

6-4 Periodicals, Web sites, etc.:

http://www.mathwork.com/ .
http://www.talkthecold.com/bizgoogle/ .
http://www.scrius.com/ .
http://www.Vlab.co.in/ .
http://www.GenLib.org/ .
http://www.SCI-hub.org/ .
http://www.Merlot.org/ .
http://www.W3schools.com/

7- Facilities required for teaching and learning:

- Computer Lab.
- Data show
- Computer software package.

Course coordinator: Dr. Abd Elmoneim Fouda
Head of the Department: Ass. Prof. Dr. Wafaa Boghdady
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
CMPN 211: 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 Communications Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Computer Engineering and Information Technology Department
Date of specifications approval:	December, 2018

B - Basic information

Title: Numerical Methods with Computer Applications **Code:** CMPN 211 **Level:** Junior **Semester:** 6 th

Credit Hours: 3 **Lectures:** 2 **Tutorial:** 2 **Practical: -** **Total:**4

Pre-requisite: MTHN103

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to introduce some numerical methods for solving many mathematical Problems. Moreover the student can solve those problems using computer programming

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)

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 (B1,B2,B3)
b2- Choose the right decision by choosing the right method (B2,B3,B11)
b3- Recognize the right method which has minimum error and using minimum numerical steps(B2,B3)

c - Professional and practical skills:

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

c1- Identify appropriate economic models (C1).
c2- Use appropriate IT packages effectively to solve numerical problems (C4).

d - General and transferable skills:
By the end of the course the student should be able to:
d1- Write technical reports (D3,D7)
d2- Communicate effectively and present data in written form (D3)
d3- Communicate using internet (D4)
d4- Search for information from 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, B11
C	Professional and practical skills	C1, C4
D	General and transferable skills	D3, D4, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Curve fitting and linear Approximation of a function.	4	4	
Interpolation			
polynomial interpolation and error estimation in the interpolation formula Lagrange interpolation	2	2	
Newton –interpolation	2	2	
Hermite interpolation.	2	2	
Numerical Integration			
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	4	4	
multistep methods .	2	2	
Numerical solution of linear and non-linear equation, Gauss-Seidel method.	4	4	
Numerical solution of nonlinear equations the fixed point iteration method, Newton-Raphson method.	2	2	
Total hours	**28**	**28**	

4 - Teaching and Learning and Assessment methods:

No	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	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	1	1	
	b3	1	1	1				1				1	1	1	
Applied Professional Skills	c1	1										1			
	c2	1										1			
General Tran. Skills	d1			1	1			1						1	
	d2		1	1	1			1						1	
	d3	1												1	
	d4		1											1	

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	16
	Reports	Two reports per semester	14
	Assignments	Bi-Weekly	10
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

Osama El-Gayar,(2005), Numerical Methods for Engineers, Lecture Note, Modern Academy.

6-2 Required books

luis f.chapore (2004), MATLAB AN INTRODUCTION WITH APPLICATIONS, WILEY

dean g.duffy (2003), advanced engineering mathematics with matlab, chapman&hall Richavd

6-3 Recommended books:

Jaan Kiusalaas(2010), Numerical Methods in Engineering with MATLAB, Cambridge University Press,.

L.Brude (1995) Numerical Analysis,4th ed., Mc Graw Hill,.
Amir Wadi Al-khafaji, John R. Tooley(1990)Numerical methods in Engineering Practice US.A.
D. Hanselman and B. Littlefield (2005), Mastering MATLAB7, Prentice Hall,
David C. Kuncicky (2004).,Matlab Programming, Pearson Prentice Hall ,
Amos Giltat, (2004),Matlab An Introduction with Applications", John Wiley.
Thomas K., Jewelly, (1990)Computer Applications for Engineers, Prentice Hall,.
Jaan Kiusalaas (2010)Numerical Methods in Engineering with MATLAB, Cambridge University Press,.

6-4 Periodicals, Web sites, etc.

http://www.math.fullerton.edu/mathews/numerical.html
http://www.mathwork.com/ .
http://www.GenLib.org/ .

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator:	Dr. Abd Elmoneim Fouda
Head of the Department:	Ass. Prof. Dr. Wafaa Boghdady
Date:	December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
CMPN310: Microprocessor Based-Systems

A- Affiliation

Relevant program: Computer Engineering and Information Technology BSc Program
Department offering the program: Computer Engineering and Information Technology Department
Department offering the course: Computer Engineering and Information Technology Department
Date of specifications approval: December 2018

B - Basic information

Title: Microprocessor Based-Systems **Code**: CMPN310 **Level**: 3rd (Senior-1), 1st Semester
Credit Hours: 3 **Pre-requisite**: CMPN111
Contact Hours: **Lectures**: 2 **Tutorial/Exercise**:1 **Practical**: 2 Total:5

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 microprocessors and microcontrollers (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 microcontroller (A4, A14).
a10- The new generations of microprocessors and microcontrollers (A9, A15).

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, A5, 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	1	--
➢ Assembly instructions for MCS51.	3	1	4
➢ The Addressing modes for MCS51 besides 8086.	1	1	--
➢ The instruction formats for MCS51 besides 8086.	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.	2	2	2
➢ The interface with input units (such as sensors, keypad …etc.).	2	1	2
➢ The interface with output units (such as motors, monitors …etc.)	2	1	2
➢ The old microprocessors versus up-to-date microprocessors	2	--	--
➢ Task for mini-project.	2	--	4
Total hours	**28**	**14**	**28**

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			
	a10	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	Grade (Degrees)
Semester Work: quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

Assem B, (2018) The Microprocessor Based Systems: lecture note Modern academy

6-2 Required books:

Rolin D. McKinlay, Janice G. Mazidi, Danny Causey and Muhammad Ali Mazidi, (2012) The 8051 Microcontroller: Prentice Hall.

6-3 Recommended books:

- Valvano, (2012) Embedded microcomputer system real time interfacing: Cengage Learning.
- Yogendra Gandole, (2012) A Text Book of Advanced Microprocessors and Microcontroller: Lambert Academic Publishing.

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 8051 kits.
- Simulator software programs like "Proteus".
- Data show

Course coordinator: Dr. Assem Badr
Head of the Department: Ass. Prof. Dr. Wafaa Boghdady
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi

Course Specification
CMPN321: Computer Architecture

A- Affiliation

Relevant program/s:	Computer Engineering and Information Technology BSc Program
Department offering the program:	Computer Engineering and Information Technology Department
Department offering the course:	Computer Engineering and Information Technology Department
Date of specifications approval:	December 2018

B - Basic information

Title: Computer Architecture	**Code**: CMPN321	**Year/Level:** Senior 1, Second Semester
Credit Hours: 3	**Pre-requisite**: CMPN 111	
Contact Hours:	**Lectures:** 2	**Tutorial/Exercise**:2 **Practical**: -0 **Total**:4

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 microcomputer 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 parallel and pipeline processors (A13).
a6- Architecture and organization of Memory unit (A8, A13, A15).
a7- Concepts of Operating system support (A1, A2, A13).
a8- Basic of assemply Programming (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 assemply Programming (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 (C1, C2)
c2- Evaluate the performance of A.L.U and parallel processor (C2, C3)
c3- Use a wide range of analytical tools, techniques, and software packages pertaining for programming the computer (C6, C14, C15)
c4- Utilize computational facilities and techniques, to design different architectures of parallel processors and pipeline systm (C4, 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, 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,A2,A3,A4,A5,A8,A10,A13,A15
B	Intellectual skills	B1,B2,B3,B4,B5,B6,B7,B12,B13,B17
C	Professional and practical skills	C1,C2,C3,C4,C6,C13,C14,C15
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	
➢ Instruction cycle and performance evaluation	2	2	
➢ Types of computer organizations an addressing modes	4	4	
➢ Programming using different addressing modes	2	4	
➢ Arithmetic and logic units design	2	4	
➢ Memory types	2	-	
➢ Design of cache memory	4	4	
➢ Performance measuring of cache	2	2	
➢ Operating system support	1	-	
➢ Pipeline and parallel processors	3	4	
➢ Seminars	2	-	
Total hours	**26**	**26**	**-**

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)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks)	16

	Reports	Two reports per semester	14
	Assignments	Bi-Weekly	10
Written Exam		Sixteenth week	40
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.
Rachard(1996),advanced computer architecture system approach, Prentice Hall.
M.Mano, (1996), Computer System Architecture, Prentice Hall.
Thomas C.Bartee, (1991), Computer Architecture and Logic Design, Mc Graw Hill,
6-3 Recommended books: Non

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: Ass. Prof.Dr. Wafaa Boghdady
Date: December 2018

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 2018)

الباب الثانى

نظام الدراسة

مادة [2]

يمنح وزير التعليم العالي بناءً على طلب مجلس إدارة الأكاديمية درجة بكالوريوس الهندسة والتكنولوجيا في أحد التخصصات التالية:-

[1] الهندسة الكهربية:

أ ـ هندسة الالكترونيات وتكنولوجيا الاتصالات .

ب ـ هندسة الحاسبات وتكنولوجيا المعلومات.

[2] الهندسة الميكانيكية:

ـ هندسة التصنيع وتكنولوجيا الإنتاج .

[3] الهندسة المعمارية:

ـ هندسة العمارة وتكنولوجيا البناء

وتتم الدراسة في هذه التخصصات حالياً بنظام الساعات المعتمدة اعتباراً من العام الدراسي 2012-2013. 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 50% من مجموع الساعات المعتمدة للبرنامج ككل (لا تقل عن 90 ساعة معتمدة)، على أن تستمر الدراسة بنظام الدراسة الفصلية للطلاب المقيدين بالأكاديمية قبل عام 2012-2013 ممن لم يحولوا للدراسة بنظام الساعات المعتمدة وذلك حتى تخرجهم.

مادة [3]

تُمنح درجة البكالوريوس في الهندسة والتكنولوجيا للطلبة الذين يجتازون بنجاح دراسة مقررات بإجمالي 180 ساعة معتمدة، مع الحصول على المعدل التراكمي المطلوب للتخرج.

مادة [4] : مدة الدراسة بنظام الساعات المعتمدة

- مدة الدراسة لنيل درجة البكالوريوس خمس سنوات موزعة على 10 فصول دراسية رئيسية ويمكن للطالب إنهاء متطلبات الدراسة قبل ذلك بفصل واحد على الأكثر.
- الحد الأقصى للدراسة 16 فصلا دراسيا ويفصل الطالب بعدها ويجوز إعادة قيده بموافقة مجلس الأكاديمية.

مادة [5] : متطلبات الدراسة في برنامج الساعات المعتمدة

طبقاً لما ورد في الإطار المرجعي للوائح المعاهد الصناعية والهندسية التي تعمل بنظام الساعات المعتمدة فإن الجدول رقم (1) 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 (1)

البيان (ساعات معتمدة)		برنامج اتصالات	برنامج حاسبات	برنامج عمارة	برنامج تصنيع
المواد الإنسانية **(8-10%)**	مواد إجبارية	12	12	14	11
	مواد اختيارية	4	4	4	6
	النسبة المئوية الكلية	%8.89	8.9%	%10	%9.4
المواد الأساسية **(15-20%)**	مواد إجبارية	36	36	28	32
	مواد اختيارية	-	-	-	-
	النسبة المئوية الكلية	%20	%20	%15.6	%17.8
المواد الهندسية الأساسية **(30-35%)**	مواد إجبارية	63	63	60	54
	مواد اختيارية	-	-	-	3
	النسبة المئوية الكلية	%35	%35	%33.3	%31.7
المواد الهندسية التخصصية **(35-40%)**	مواد إجبارية	50	50	60	65
	مواد اختيارية	15	15	14	9
	النسبة المئوية الكلية	%36.11	%36.1	%41.1	%41.1

مادة [6]

يقوم طلبة المستوى الرابع 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 [7] : 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 صفر والأول: 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 الثاني والثالث ، ويقيم كل تدريب بثلاثة ساعات معتمدة، وتضاف نتيجة كل تدريب إلى تقييم الفصلين الأول والثاني من المستوى الرابع على التوالي.

ويتم التدريب بالتفاصيل الآتية:-

أ- التدريب الصيفي

(1) طلاب المستوى صفر

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 25

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.

(2) طلاب المستوى الأول

يتم التدريب داخل الأكاديمية أو خارجها ، لتدريب الطلاب فى مجالات الدراسة التى يقترحها القسم ويقرها مجلس الاكاديمية ، ويقسم الطلبة إلى مجموعات بحد أقصى 20 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

(1) طلاب المستوى الثاني

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 (2).

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.

(2) طلاب المستوى الثالث

يتم التدريب بنفس الكيفية التي يتم بها تدريب المستوى الثاني على أن يضاف تقدير هذا التدريب إلى نتيجة الفصل الدراسي الثاني للمستوى الرابع. ويتم التدريب في مؤسسة غير التي أتم فيها تدريب المستوى الثاني 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

1- يسدد كل طالب مبلغ 500 جنيه عن كل سنة في مرحلة التدريب الصيفي (المستوى صفر والأول) ويجوز زيادة هذا المبلغ طبقا لدراسة التكلفة الفعلية للتدريب بعد تصديق رئيس الإدارة المركزية المختص بوزارة التعليم العالى.

2- يسدد كل طالب ما قيمته ثلاثة ساعات معتمدة عن كل مستوى في مرحلة التدريب الصيفى التخصصي لتغطية تكاليف التدريب(المستوى الثاني والثالث).

3- 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.

4- 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 [8]

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 [9]

يكون ترشيح الطلاب للقبول بالأكاديمية عن طريق مكتب التنسيق ما لم يصدر قرار من وزارة التعليم بغير ذلك

مادة [10]

- يشترط في قيد الطالب في غير معاهد الدراسات العليا :

(1) 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.

(2) أن يثبت الكشف الطبي خلوه من الأمراض المعدية وصلاحيته لمتابعة الدراسة وفقاً للقواعد التي يحددها المجلس الأعلى لشئون المعاهد.

(3) أن يكون متفرغاً للدارسة بالأكاديمية وذلك وفقاً لأحكام اللوائح الداخلية للمعاهد.

(4) أن يكون محمود السيرة حسن السمعة.

مادة [11]

- 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 [12]

- 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 [13] 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 (41) من قانون 52 لسنة 1970 ولائحة المعاهد رقم (1088) لسنة 1987: تحويل ونقل قيد الطلاب فيما بين المعاهد وفق القواعد الآتية:

1) لا يجوز النظر في تحويل الطلاب المقيدين بالمستوى صفر 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.

2) يجوز النظر في تحويل الطلاب المقيدين بمستوى أعلى من المستوى صفر بين المعاهد المتناظرة إذا وجدت ظروف اجتماعية أو صحية تقتضى التحويل وذلك بموافقة مديري المعهدين.

3) يجوز نقل قيد الطالب المنقول إلى مستوى أعلى من المستوى صفر 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.

4) 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.

5) 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 (42،44) من قانون 52 لسنة 1970 ولائحة المعاهد رقم (1088) لسنة 1987:

- 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 صفر 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:-

1) الطالب المستجد الذي لم يستكمل إجراءات قيده لعذر مقبول.

2) الطالب الذي سحب أوراقه وهو مقيد بالأكاديمية وقدم عذراً.

3) 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 اذا 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.

الـبــاب الــرابـــع
الامتحانات

مادة (14)

- 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 (15)

- 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 (16)

طبقا للمادة (50) من القانون رقم (52) لسنة 1970 ولائحته التنفيذية الصادرة بقرار وزير التعليم العالى رقم 1088 لسنة 1987 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 (17)

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 (18)

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 (19)

- 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.

البـاب الخامس

قواعد التدريس والقيد والتسجيل وتـقديرات النجاح

مادة [20] : 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 [21] : المقررات العامة

يعهد مجلس الأكاديمية إلى قسم أو أكثر بتدريس المقررات العامة ذات الكود (عام) تحت الإشراف المباشر لوكيل الأكاديمية.

مادة [22] : شروط القيد

يتم القيد للدراسة بنظام الساعات المعتمدة اعتباراً من العام الدراسي 2018-2019 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 50% من الساعات المعتمدة من إجمالي ما تم دراسته بالنظام الفصلي طبقاً لما ورد في المادة 28 من قانون 52 لسنة 1970.

مادة [23] : ساعات التدريس بنظام الساعات المعتمدة

(أ) ساعات المحاضرات: 1 ساعة محاضرة تساوي 1 ساعة معتمدة

(ب) ساعات التمـــارين : تمرين مدته 1 ساعة يساوي صفر

تمرين مدته من 2 إلى 3 ساعات يساوي 1 ساعة معتمدة

(ج) ساعات المعمل والتطبيقات العملية: ساعتين معمل أو تطبيقات تساوي 1 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 [24] : 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 15 أسبوع دراسى.

الفصل الدراسي الثاني : يبدأ عقب إجازة منتصف العام ولمدة 15 أسبوع دراسى.

الفصـل الصيفـــــــي : يبدأ خلال أسبوعين من نهاية امتحانات الفصل الدراسى الثانى ولمدة 8 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 [25] : شروط التسجيل للدراسة بنظام الساعات المعتمدة

- يتقدم الطالب لتسجيل المقررات كل فصل دراسي، وبحد أقصى 18 ساعة معتمدة، بشرط استيفاء شروط التسجيل في كل مقرر، وبعد استشارة المرشد الأكاديمي، وفي المواعيد المحددة بتوقيتات التسجيل، مادة 17 من قانون 52 لسنة 1970، 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 صفر	-0
Sophomore	المستوى الأول	-1
Junior	المستوى الثاني	-2
Senior 1	المستوى الثالث	-3
Senior 2	المستوى الرابع	-4

- يمكن للطالب الذى يبلغ معدله التراكمى 3.3 أو أكثر، التسجيل فى أكثر من 18 ساعة معتمدة وبحد أقصى 21 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 6 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 3.3 او أكثر فى الفصل الرئيسى السابق . ويجوز أن يتم التسجيل بحد أقصى 9 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 25% من رسوم التسجيل.
- على الطالب تحقيق معدل تراكمى لا يقل عن (2) فى اى وقت فإذا قل يتم إنذاره ولا يصرح له بالتسجيل فى الفصل التالى لأكثر من 12 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 أقصى2 (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 (2). 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 75% 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 (2) يوضع تحت المراقبة الأكاديمية.
- أثناء وضع الطالب تحت المراقبة الأكاديمية لا يسمح له بالتسجيل فى مقررات تزيد عن 12 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 30 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 1.5 فى نهاية الفصل الدراسى الرئيسى الرابع من بدء التحاقه بالأكاديمية.

- الطالب الذى يقل متوسطه التراكمى عن (2) فى سته فصول دراسية متصلة أو فى ثمانية فصول دراسية غير متتالية.
- الطالب الذى لا يتمكن من استكمال متطلبات التخرج خلال 16 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 135 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 [26] : رسوم الدراسة

- وتظل قيمة الساعة المعتمدة كما هي لأي طالب من وقت التحاقه بالأكاديمية وحتى تخرجه. وتزاد قيمة الساعة المعتمدة سنوياً بنسبة 5% 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 25% 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 12 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 [27] : متطلبات الحصول على درجة البكالوريوس بالساعات المعتمدة

يشترط لتخرج الطالب ما يلى:

- أن يجتاز الطالب عدداً من الساعات المعتمدة المقررة، ومقدارها 180ساعة معتمدة، وبمعدل تراكمى لا يقل عن (2) متضمنة مشروع البكالوريوس طبقا للمادة [6].
- أن يؤدى التدريب العملى طبقا لما ورد في المادة [7].
- أن يجتاز بنجاح الرخصة الدولية لقيادة الحاسب الآلي **(ICDL)**.

مادة [28] : 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]24[.

مادة [29] : 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 [30] : تقديرات المقررات الدراسية

- تقدر نقاط كل مقرر على النحو الموضح بالجدول رقم (2):

جدول رقم (2)

التقدير	عدد النقاط	التقدير المكافئ	النسبة المئوية المناظرة
A+	4.0	ممتاز (+)	95% وأعلى
A	3.7	ممتاز	90% حتى أقل من 95%
A-	3.3	ممتاز (-)	85% حتى أقل من 90%
B+	3.0	جيد جداً (+)	80% حتى أقل من 85%
B	2.7	جيد جداً	75% حتى أقل من 80%
C+	2.3	جيد (+)	70% حتى أقل من 75%
C	2.0	جيد	65% حتى أقل من 70%
D+	1.7	مقبول (+)	60% حتى أقل من 65%
D	1.3	مقبول	55% حتى أقل من 60%
D-	1.0	مقبول (-)	50% حتى أقل من 55%
F	صفر	راسب	أقل من 50%

- يتم إنذار الطالب الذى يحصل على تقدير أقل من (2) فى أى مقرر لإعادة دراسته لتحسين النتيجة إلى (2) 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 [31] : 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 (2) على الأقل.

- تحسب نقاط كل مقرر على أنها عدد ساعاته المعتمدة مضروبة فى عدد النقاط التى حصل عليها الطالب، جدول رقم (2).
- 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 (2).
- 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 (2).

مثال : بفرض حصول الطالب في فصل دراسي على التقديرات الموضحة بالجدول رقم (3):
بالرجوع إلى الجدول رقم (2) 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 (3)

المادة	عدد الساعات المعتمدة	التقدير	النقاط	عدد النقاط المحتسبة
لغة انجليزية	3	A+	4	12
برمجة حاسب	3	C	2	6
فيزياء	3	B+	3	9
كيمياء	3	A+	4	12
إنتاج	3	C	2	6
إجمالي عدد النقاط = 45	إجمالي عدد الساعات المعتمدة = 15 متوسط نقاط الفصل الدراسى **(GPA)** = 45 ÷ 15 = 3			

مادة [32] : تعريف حالة الطالب الدارس بنظام الساعات المعتمدة
كلما أكمل الطالب 20% من متطلبات التخرج اعتبر منتقلاً من مستوى إلى مستوى أعلى منه (المستويات من صفر إلى 4)، ولا يتطلب ذلك تحديد نوعية أو مستوى المقررات التي أكملها الطالب، ويعتبر ذلك نوعاً من التعريف بموقع الطالب بالأكاديمية.

مادة [33] : 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 40 % من مجموع درجات المقرر، وذلك بواقع 40 % للامتحان التحريرى للمواد ذات الشق العملي و40 % أعمال السنة و20% للامتحان العملي وبواقع 40 % للامتحان التحريري للمواد التى لا تتضمن شق عملى و60 % لأعمال السنة. مدة الامتحان2 ساعة لجميع المواد عدا المواد الإنسانية فتكون ساعة فقط.

(ج) 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 40% من مجموع الدرجات و 60% لأعمال السنة، ومدة امتحان مادتي التصميم المعماري والتصميمات التنفيذية هي 7 ساعات، ومواد الانشاء المعمارى والظل والمنظور والتصميم العمرانى 5 ساعات، مواد التخطيط والاسكان 4 ساعات وباقي المواد ساعتين .

(د) يعقد لكل مقرر امتحان تحريري في منتصف الفصل الدراسي لا تقل درجته عن 20 % من مجموع درجات المقرر باستثناء المقررات التي تحددها اللائحة مثل مشروع التخرج والتدريب الصيفي والندوات والأبحاث.

(ه) يعد الطالب راسباً فى المقرر إذا حصل فيه على مجموع درجات أقل من 60 % (تقدير **D**)، 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.

(و) يجوز السماح للطالب بإعادة بعض المقررات التي نجح فيها من قبل أو إضافة مقررات جديدة له، بغرض رفع متوسط النقاط ليحقق متطلبات التخرج.

مادة [34] : نسبة الحضور والحرمان من الامتحان والأعذار

(أ) الحد الأدنى لنسبة الحضور للمقرر (لا تقل عن 75%) 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 [35] : التحويل إلى برامج الساعات المعتمدة

يضع مجلس الأكاديمية ضوابط وشروط التحويل إلى البرامج بنظام الساعات المعتمدة بحيث لا يتم نقل أكثر من 50% من الساعات المعتمدة من إجمالي ما تم دراسته بالنظام الفصلي.

مادة [36] : النظام الكودى للمقررات

يتم تحديد كود المقررات الدراسية طبقا للجدول رقم (4)

مفتاح الكود: $N_1\ N_2\ N_3$ $L_1\ L_2\ L_3\ L_4$ (مثال: MECN 101 Mechanics)

جدول رقم (4)

مفتـــــــــاح الكـــــــــود $L_1 L_2 L_3 L_4$ $N_1 N_2 N_3$	
1- $L_1 L_2 L_3 L_4$ أربعة حروف ترمز إلى القسم والتخصص المسئول عن تدريس المقرر	
قسم العمارة	ARCN
قسم الحاسبات	CMPN
قسم الاتصالات	ELCN
تخصص الرياضيات قسم العلوم الأساسية	MTHN
تخصص الفيزياء قسم العلوم الأساسية	PHYN
تخصص الميكانيكا قسم العلوم الأساسية	MECN
تخصص الكيمياء قسم العلوم الأساسية	CHEN
قسم هندسة التصنيع	MNFN
تخصص المواد الإنسانية وتتبع وكيل الأكاديمية إشرافيا	GENN
2- N_1 رقم يرمز إلى المستوى التي تدرس به المادة	
$N_1 = 0$	المستوى صفر
$N_1 = 1$	المستوى الأول
$N_1 = 2$	المستوى الثاني
$N_1 = 3$	المستوى الثالث
$N_1 = 4$	المستوى الرابع
3- N_2 رقم 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
4- N_3 رقم يرمز إلى مسلسل المقرر داخل التخصص	