

**Electronic Engineering and Communication Technology
BSc Program Specifications
By Law 2020**

August 2020

مقدمة

الهندسة هي المعرفة بالعلوم الطبيعية والرياضية، والتي تكتسب بالدراسة والخبرة والممارسة، وتطبق بوعي لتطوير أساليب تستخدم إقتصاديا لتطوير المواد وقوى الطبيعة لصالح البشرية. وهي أيضا المقدر على الشروع في النشاط والسلوك المرتبط بالعمليات الهندسية والنظم والمشاكل والفرص، والتاريخ، والمستقبل، والتأثيرات، والأخلاق والمردودات. كما أنها تنطوي على المعرفة، وطرق التفكير والتصرفات والقدرات. كما تساعد في إعداد الأفراد لتقديم خيارات مدروسة في إطار كونهم مستهلكين أو عمالا أو مواطنين وأعضاء في المجتمع الدولي. وينبغي أن يحقق التعليم الهندسي التميز والتفوق في التعليم العالي والدراسات العليا والبحوث، والخدمة العامة، وتطوير المعارف الهندسية. وهو يهدف إلى 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 الهندسي يهدف إلى تحفيز الطلاب وأعضاء هيئة التدريس على التعلم والنمو، كذلك تحقيق وتلبية احتياجات المجتمع قومياً وإقليمياً ودولياً. كما يهدف أيضا إلى إعداد الطلبة لمهنة منتجة ومفيدة في المجال الهندسي مبنية على أسس حديثة بما فيها اللحاق بعلوم الفضاء والاتصالات الرقمية والنانو تتممها أخلاقيات معنوية قوية.

ويختص المهندسون بحل المشاكل الواقعية، 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 أمنا وملائمة للاستعمال اليومي. كما يسعون إلى التطوير من خلال الإختراع 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 تلوث الهواء لا يمكن أن تُحلّ بدون اعتبار التناقضات الأخلاقية والسياسية والقانونية والاجتماعية. علاوة على ذلك، يجب أن يأخذ في الاعتبار تأثير الحلول الهندسية المتاحة على مصالح الأفراد والمجموعات.

وتقدم دراسة الهندسة للطلاب تعليما فعالا ومبني على أسس تكنولوجية، أخذاً في الاعتبار التوقعات المستقبلية للعلم والتكنولوجيا. وهي 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 للإعتماد وجودة التعليم، الطبعة الأولى يوليو 2015، مفاهيم شاملة تمثل التوقعات والطموحات العامة بخصوص معايير درجة البكالوريوس في العلوم الهندسية، كما توضح هذه المفاهيم المواصفات والخصائص التي يتمتع بها خريج البرامج الدراسية الهندسية خاصة:

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

وقد تم تصميم برنامج هندسة الإلكترونيات وتكنولوجيا الاتصالات لإعداد المهندسين المتميزين في مجالات التصميم الإلكتروني وتكنولوجيا الاتصالات، إضافة إلى هندسة الطاقة الخضراء التي تدرس من خلال مجموعة من إستخدامات الطاقة الشمسية المتميزة والتي تعطى لخريج البرنامج تأهيلا لسد احتياجات سوق العمل.

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

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

والله ولي التوفيق،،،

أ.د شومان الشحات
رئيس قسم الهندسة الكهربائية

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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.Nelly Mohamed.
Assistant Coordinator: Dr.Ibrahim Amin
External Evaluators: Prof.....
Academic Standard: The current program fulfills the requirements of the National Academic Reference Standards (NARS) Engineering, 2nd Edition, 2018, for the BASIC ELECTRICAL Engineering graduate and similar programs.
Total Credit Hours: 165 Hours
Total Contact Hours: 258 Hours
Program Started in: 2000
Dates of program specifications approval: August, 2020

1.2. Staff Members

The Electronic Engineering and Communication Technology B.Sc. Program is taught by 23 highly qualified staff members.They are qualified to teach the courses allocated to them. Their personnel resume are included in the courses files.

1.3. Internal and External Reviewer (s)

The program Specifications was evaluated internally by the quality office. The evaluation report showed that the program specifications agree with the Adopted Academic Reference Standards.

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.

The current program fulfills the requirements of the National Academic Reference Standards (NARS) Engineering, 2nd Edition for the BASIC ELECTRICAL Engineering graduate and similar programs.

2.2. Program Mission and Aims

2.2.1. Program Mission

Provide a fancy academic level to prepare a distinguished engineer in the field of electronic engineering and communication technology through earning the suitable scientific, professional, moral competencies which can manage him for competition and keeping up the global developments and active contribution in the society progress and achievement of the overall development requirements.

2.2.2. Academy Mission

The Modern Academy for engineering and Technology aims at preparing distinguished engineering cadres capable of competing scientifically and professionally on the local and regional levels to meet the needs of the society in the various sectors of the country. This is achieved through providing students with modern advanced technological knowledge, concepts and skills via various programs, within a frame of cultural, social and ethical values.

2.2.3. Conformity of the Program Mission to the Modern Academy Mission

		Modern Academy Mission Keywords			
		The graduates can compete scientifically and professionally on the local and regional levels	The graduate's qualification meets the needs of the society in the various sectors of the country	The graduates are provided with modern technological knowledge, concepts and skills	The graduated qualification is achieved within a frame of cultural, social and ethical values
Key words of the program mission	Fancy academic level	✓	✓		
	Scientific, professional, moral competencies			✓	✓
	Keeping up the global developments	✓		✓	
	Society progress and achievement of the overall development requirements		✓	✓	

2.2.4. Program Aim

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

2.2.5. Conformity of the Program Aims to its Mission

		Program Mission Keywords			
		Fancy academic level	Scientific, professional, moral competencies	Keeping up the global developments	Society progress and achievement of the overall development requirements
Key words of the program aims	Providing future engineers	✓	✓		
	Appropriate theoretical knowledge and technical skills		✓	✓	
	Related professional market demands.			✓	✓

2.2.6. 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.

2.3. The Attributes of the Graduate

The Engineering Graduate must:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;
3. Behave professionally and adhere to engineering ethics and standards;
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles;
7. Use techniques, skills and modern engineering tools necessary for engineering practice;
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies;
9. Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

2.4. Competencies

The Electronic Engineering and communication Technology BSc graduate must be able to:

NARS Competencies of Engineering Graduate	<p>C1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.</p> <p>C2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.</p> <p>C3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.</p> <p>C4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.</p> <p>C5. Practice research techniques and methods of investigation as an inherent part of learning.</p> <p>C6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.</p> <p>C7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.</p> <p>C8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.</p> <p>C9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.</p> <p>C10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.</p>
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NARS Competences of Basic Elec. Eng & similar prog	<p>C11. Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.</p> <p>C12. Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.</p> <p>C13. Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.</p> <p>C14. Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.</p> <p>C15. Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.</p>
ARS Competencies of the Program	<p>C16. Explain, Classify, and compare newly advanced technologies used for the modern electronics and communication systems.</p> <p>C17. Design, model and analyze different electronics and communication systems and subsystems for specific applications and identify the appropriate tools to optimize these designs.</p> <p>C18. Use state of the art devices and equipment to measure and test different parameters of different modern electronics and communication systems and subsystems.</p>

2.5. Curriculum Structure and Content

The program consists of 165 credits spread over 63 courses, covering topics in Humanities and Social (HSS), Business Administration (BAS) Sciences, Mathematics and Basic Sciences (MBS), Engineering Culture Sciences (ECS), Basic Engineering Sciences (BES), Applied Engineering and Design Sciences (AEDS), and Project and Industrial Training (PIT) as required by the Supreme Council of Universities (SCU) in Egypt.

2.5.1 University Requirements (Humanities and social science courses)

The main purpose of a university education is not only to prepare students for successful careers but also to provide them with the knowledge and skills to develop a rational, well-rounded and successful personal identity through:

- 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.

The university requirements courses are unified for all of the programs of the Modern Academy. They consist of 16 credits (9.7 % of total 165 credits), which are satisfied by completing eight (8) courses:

- 1. Six (6) compulsory courses equivalent to 12 credits (7.27%), as listed in table 1- a.
- 2. Two (2) elective courses equivalent to 4 credits (2.43%), as listed in table 1- b.

**Table 1-a Compulsory Courses of University Requirements
(12 credit Hours, 7.27% of total 165 credits).**

Course Code	Total Credit	Contact Hours				Course Title	Prerequisites	Subject Area							
		L	T	P	Total			Hum. & Soc. Sc.	Business Admins.	Math. & B. Sc.	Engineering Culture	Basic Eng. Sc.	App. Eng. & Des.	Proj. & Ind. Training	
GENn041	2	2	-	-	2	Contemporary Social Issues	None	2							
GENn042	2	2	-	-	2	English Language.	None	2							
GENn043	2	2	-	-	2	History of Engineering and Technology.	None	2							
GENn141a	2	2	-	-	2	Presentation Skills.	None	2							
GENn142	2	2	-	-	2	Technical Report Writing.	None	2							
GENn341	2	2	-	-	2	Project Management.	None		2						
Total	12	12	-	-	12	7.27 %		10	2						

**Table 1-b Elective Courses of University Requirements
(4 Credits Hours, 2.43% of total 165 credits).**

	Course Code	Total Credit	Contact Hours				Course Title	Prerequisites	Subject Area						
			L	T	P	Total			Hum. & Soc. Sc.	Business Admins.	Math. & B. Sc.	Engineering Culture	Basic Eng. Sc.	App. Eng. & Des.	Proj. & Ind. Training
Elective 1	GENn351a	2	2	-	-	2	Technical English.	GENn042	2						
	GENn352	2	2	-	-	2	Risk Management	None							
	GENn353	2	2	-	-	2	Industrial Psychology.								
Elective 2	GENn451a	2	2	-	-	2	Environmental Effects of Electromagnetic Waves.	None	2						
	GENn452a	2	2	-	-	2	Civilization and heritage								
	GENn453	2	2	-	-	2	Marketing								
Total		4*					2.43 %		2*	2*					

2.5.2 Faculty/Institute Requirements (Mathematics, Basic Science, and Engineering Culture Courses)

Mathematics

Institute requirements provide students with the knowledge and skills that are essential to develop a successful engineer. The Institute core that is common to all credit hours programs is implemented through:

- Acquiring knowledge in mathematical and analytical methods.
- The ability to reason about and conceptualize engineering components, systems or processes using analytical methods as related to the Electronic Engineering and Communication Technology.
- The ability to analyze and model engineering components, systems and processes specific to the Electronic Engineering and Communication Technology.
- The skill of using probability and statistical methods.

Basic Sciences

- Acquiring knowledge of physics, chemistry, mechanics, earth sciences, biological sciences and other specific subjects which focus on understanding the physical world.
- The ability to select and apply scientific principles in practical problem solving.
- 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.
- The ability to adopt scientific evidence-based techniques in problems solving.

Engineering culture

- Acquiring knowledge in the areas related to different engineering trends.
- The ability to overview basic knowledge about different engineering specializations.

The Institute Requirements (Mathematics, Basic Science, and Engineering Culture Courses) courses are unified for all of the programs of the Modern Academy. They consist of fifteen (15) courses with 40 credits (24.24 % of total 165 credits), as listed in table 2.

**Table 2 Courses of Institute Requirements
(40 credits, 24.24% of total 165 credits)**

Course Code	Total Credit	Contact Hours				Course Title	Prerequisites	Subject Area							
		L	T	P	Total			Hum. & Soc. Sc.	Business Admins.	Math. & B. Sc.	Engineering Culture	Basic Eng. Sc.	App. Eng. & Des.	Proj. & Ind. Training	
CHEn001	3	2	1	2	5	Chemistry.	None			3					
MECn001	2	1	3	-	4	Mechanics -1.	None			2					
MECn002	2	1	3	-	4	Mechanics-2.	MECn001			2					
MTHn001	3	2	3	-	5	Mathematics-1(Algebra and Calculus).	None			3					
MTHn002	3	2	3	-	5	Mathematics-2(Integration and Analytic Geometry).	MTHn001			3					
PHYn001	3	2	1	2	5	Physics-1.	None			3					
PHYn002	3	2	1	2	5	Physics -2.	PHYn001			3					
MNFn001	2	1	3	-	4	Engineering Graphics 1	None				1	1			
MNFn002	2	1	3	-	4	Engineering Graphics 2	MNFn001				1	1			
MNFn003	3	2	-	3	5	Principles of Production Engineering.	None				1	2			
CMPn010	4	2	3	2	7	Program Design and Computer Languages.	None				4				
MTHn107	3	2	2	-	4	Mathematics -7 (Introduction to Prob. and Statistics)	MTHn002			3					
ENGn213	3	2	-	2	4	Advanced Computer Systems Implementation.	CMPn010*					2	1		
ENGn311	2	2	1	-	3	Engineering Economy.	None		1			1			
ENGn312	2	2	-	-	2	Engineering Laws and Professional ethics.	None					2			
Total	40	26	27	13	66	24.24			1	22	7	9	1		

2.5.3 General Specialization Requirements (Basic Engineering Courses)

The general specialization courses allow:

- Integrating knowledge and understanding of mathematics and physical sciences to develop basic engineering laws and concepts related to the Electronic Engineering and Communication Technology.
- 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.
- The ability to deal effectively with numbers and concepts to identify/solve complex and open-ended engineering problems.

The requirements of the general specialization of Electronic Engineering and Communication Technology bachelor program consist of 58 credits (35.15 % of total 165 credits), which are satisfied by completing twenty (20) courses as listed in table 3.

**Table 3 Requirements of the general specialization of the program
(58 Credit Hours, 35.15 % of total 165 credits)**

Course Code	Total Credit	Contact Hours				Course Title	Prerequisites	Subject Area							
		L	T	P	Total			Hum. & Soc. Sc.	Business Admins.	Math. & B. Sc.	Engineering Culture	Basic Eng. Sc.	App. Eng. & Des.	Proj. & Ind. Training	
MTHn103	3	2	3	-	5	Mathematics -3(Differential Equations and Transforms).	MTHn002			3					
MTHn104	3	2	3	-	5	Mathematics-4(Advanced Calculus).	MTHn001			3					
ELCn114	2	1	2	1	4	Modern Theory of Solids	PHYn002			2					
CMPn110	3	2	2	-	4	Data Structures and Algorithms.	CMPn010					1	2		
ELCn111	3	2	1	2	5	Electrical Circuit Analysis-1.	MTHn002, ELCn060					2			1
ELCn112	3	2	3	-	5	Electrical Circuit Analysis-2.	ELCn111					2			1
ELCn113	3	2	1	2	5	Electrical Measurements.	ELCn111					2			1
CMPn111	4	3	2	1	6	Logic Circuits Design-1.	MTHn001					2	2		
ELCn115	2	1	2	1	4	Semiconductors for Microelectronics.	ELCn114					2			
MTHn208	2	2	1	-	3	Mathematics -8 (Complex Analysis and P. D. E).	MTHn002			2					
CMPn210	3	2	1	2	5	Engineering Computer Applications.	CMPn010	1						2	
ELCn210	3	3	-	1	4	Control-1. (Principles of Automatic Control).	MTHn103					1	2		
ELCn212	3	2	1	2	5	Microelectronic Circuits-1	ELCn115, ELCn160					2	1		
ELCn214	3	2	1	2	5	Electronic Measurements.	ELCn113					3			
ELCn215	3	2	1	2	5	Communications-1.	ELCn211					3			
ELCn218	3	2	2	1	5	Electrical Power Engineering.	ELCn112					3			
ELCn261	1	-	2	-	2	Seminar	+66Credits							1	
CMPn310	3	2	1	2	5	Microprocessor Based - Systems.	CMPn111	1						2	
ELCn321	4	3	1	2	6	Communications-2.	ELCn215					1	3		
ELCn422	4	3	1	2	6	Communications-3 (Information Theory and Coding).	MTHn107				1			3	
Total	58	40	31	23	94	35.15 %		2	-	10	1	24	18	3	

2.5.4 Specific Specialization Requirements (Applied Engineering and Design Courses)

- a) Attaining knowledge of operational practice, engineering codes and design techniques relevant to the subject
- 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

2.5.5 Specific Specialization Requirements (Projects & Training)

- 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 Electronic Engineering and Communication 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.

The requirements of the specific specialization (Applied Engineering and Design) of the Electronic Engineering and Communication Technology bachelor program consist of 51 credits (30.91 % of total 165 credits), which are satisfied by completing Twenty (20) courses:

- 1. Sixteen (16) Compulsory, Projects and Industrial Training Courses equivalent to 39 credits (23.64 %), as listed in table 4- a.
- 2. Four (4) Applied Engineering Elective Courses equivalent to 12 credits (7.27 %), as listed in table 4- b.

**Table 4-a Requirement of the Specific Specialization of the Program
Compulsory courses
(39Credit Hours 23.64 % of total 165 credits)**

Course Code	Total Credit	Contact Hours				Course Title	Prerequisites	Subject Area							
		L	T	P	Total			Hum. & Soc. Sc.	Business Admins.	Math. & B. Sc.	Engineering Culture	Basic Eng. Sc.	App. Eng. & Des.	Proj. & Ind. Training	
ELCn060	-				-	Summer Training 1	None								
ELCn160	-				-	Summer Training 2	ELCn060								
ELCn211	3	2	2	-	4	Signal Analysis.	MTHn103					3			
ELCn213	3	2	1	2	5	Microelectronic Circuits-2	ELCn212					2	1		
ELCn260	-	-	-	-	-	Industrial Training-1.	ELCn160	-							-
ELCn320	4	3	1	2	6	Control-2(Digital and PLC Control)	ELCn210					1	3		
ELCn323	3	2	3	-	5	Electromagnetic Field Theory	PHYn002							3	
ELCn324	4	3	1	2	6	Microwave Engineering	ELCn323				1	2	1		
ELCn360	-	-	-	-	-	Industrial Training-2.	ELCn260 + 99 Credits	-							-

ELCn361	2	1	1	2	4	Project-1.	99 Credits + ELCn213						1	1
ELCn421	4	3	1	2	6	Antennas and Wave Propagation.	ELCn323					1	3	
ELCn423	4	3	1	2	6	Communications-4 (Advanced Communications Systems).	ELCn321						4	
ELCn424	4	3	1	2	6	Radio and Television Engineering Systems.	ELCn211					1	3	
ELCn425	3	2	2	1	5	Digital Signal Processing.	MTHn103 CMPn111					1	2	
ELCn460	2	2	-	1	3	Project-2a.	ELCn361							2
ELCn461	3	2	-	2	4	Project-2b.	ELCn460						1	2
Total	39	28	14	18	60		23.64 %	-	-	-	1	11	22	5

**Table 4-b Requirement of The Specific Specialization of The Program
Elective Courses
(12 Credit Hours 7.27% of total 165 credits)**

	Course Code	Total Credit	Contact Hours				Course Title	Prerequisites	Subject Area						
			L	T	P	Total			Hum. & Soc. Sc.	Business Admins.	Math. & B. Sc.	Engineering Culture	Basic Eng. Sc.	App. Eng. & Des.	Proj. & Ind. Training
Elective 3	ELCn331	3	2	1	2	5	Very Large-Scale Integrated Systems (VLSI Systems)	ELCn213							
	ELCn332						VHDL	ELCn213						1	2
	ELCn335						Modern Telephone Central Offices.	ELCn215							
Elective 4	CMPn321	3	2	2	-	4	Computer Architecture	CMPn111							
	ELCn333						Radar Systems and Remote Sensing	ELCn211						1	2
	ELCn334						Advanced Topics in Communications.	ELCn321							
Elective 5	ELCn431	3	2	1	2	5	Optical Fiber Communications.	ELCn324							
	ELCn432						Microwave Circuits and Devices	ELCn324						1	2
	ELCn438						Acoustics.	None							
Elective 6	ELCn433	3	2	2	-	4	Communications Networks.	ELCn321							
	ELCn434						Mobile Communications.	ELCn321						1	2
	ELCn437						Satellite Communications	ELCn321							
Total		12				18	7.27%						4	8	

2.5.6 Sample Study Plan

A sample study plan for the Electronic Engineering and communication Technology BSc program is presented as one recommended sequence to complete the graduation requirements over 10 main semesters, the Fall and Spring semesters per academic year. Since the program is based on the credit hours system of education, the student does not have to take the courses during the semester indicated in the study plan as long as the course prerequisites are satisfied. The academic year is divided into 2 main semesters. In addition to summer courses that enable high caliber students to finish the program in nine semesters only (each summer term shouldn't exceed 6 credit hours).

Table 5: First Semester (Level zero)

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
CMPn010	Program Design and Computer Languages.	4	2	3	2	7
GENn041	Contemporary Social Issues	2	2	-	-	2
MNFn001	Engineering Graphics-1	2	1	3	-	4
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	13	4	29

Table 6: Second Semester (Level zero)

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
CHEn001	Chemistry.	3	2	1	2	5
MNFn002	Engineering Graphics-2	2	1	3	-	4
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
Total		18	12	11	7	30

Table 7: 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
ELCn111	Electrical Circuit Analysis-1	3	2	1	2	5
CMPn111	Logic Circuits Design-1.	4	3	2	1	6
ELCn114	Modern Theory of solids	2	1	2	1	4
MTHn103	Mathematics -3 (Differential Equations and Transforms).	3	2	3	-	5
GENn141a	Presentation Skills.	2	2	-	-	2
ENGN311	Engineering Economy.	2	2	1	-	3
Total		16	12	9	4	25

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
GENn142	Technical Report Writing	2	2	-	-	2
MTHn104	Mathematics -4(Advanced Calculus)	3	2	3	-	5
ELCn115	Semiconductors for Microelectronics	2	1	2	1	4
Total		16	11	11	3	25

Table 10: Summer Training

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCn160	Summer Training-2	-	-	-	-	-
Total		-	-	-	-	-

Table 11: 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).	3	3	-	1	4
ELCn212	Microelectronic Circuits-1	3	2	1	2	5
CMPn210	Engineering Computer Applications	3	2	1	2	5
MTHn107	Mathematics -7 (Introduction to Probability. and Statistics).	3	2	2	-	5
ELCn211	Signal Analysis	3	2	2	-	4
Total		17	13	6	5	25

Table 12: 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
ENGN213	Advanced Computer Systems Implementation.	3	2	-	2	4
Total		18	12	8	9	29

Table 13: Summer Training

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCn260	Industrial Training -1	-	-	-	-	-
Total		-	-	-	-	-

Table 14: 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
CMPn310	Microprocessor Based Systems.	3	2	1	2	5
ELCn361	Project-1	2	1	1	2	4
ENGN312	Engineering Laws and Professional ethics.	2	2	-	-	2
Elective 1	Elective course of University Requirements	2	2	-	-	2
	<ul style="list-style-type: none"> • GENn351a Technical English • GENn352 Risk Management • GENn353 Industrial Psychology. 					
Total		16	12	6	6	24

Table 15: 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
Elective 3	<u>Elective Course of Specific Specialization</u>	3	2	1	2	5
	<ul style="list-style-type: none"> • ELCn331 Very Large Scale Integrated Systems • ELCn332 VHDL • ELCn335 Modern Telephone Central Offices. 					
Elective 4	<u>Elective Course of Specific Specialization</u>	3	2	2	-	4
	<ul style="list-style-type: none"> • ELCn333 Radar Systems and Remote Sensing • ELCn334 Advanced Topics in Communications. • CMPn321 Computer architecture 					
Elective 2	<u>Elective course of University Requirements</u>	2	2	-	-	2
	<ul style="list-style-type: none"> • GENn451a Environmental Effects of Electromagnetic Waves • GENn452a Civilization and heritage • GENn453 Marketing 					
Total		16	12	5	6	23

Table 16: Summer Training

Code	Subject	Total Credits	Contact Hours			
			L	T	P	Total
ELCn360	Industrial Training -2	-	-	-	-	-
Total		-	-	-	-	-

Table 17: 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)	2	2	-	1	3
ELCn424	Radio and Television Engineering Systems.	4	3	1	2	6
Elective 5	<u>Elective Course of Specific Specialization</u>	3	2	1	2	5
	<ul style="list-style-type: none"> • ELCn431 Optical Fiber Communications • ELCn432 Microwave Circuits and Devices • ELCn438 Acoustics 					
Total		16	12	5	8	25

Table 18: 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
Elective 6	Elective Course of Applied Engineering and design					
	• ELCn433 Communication Networks	3	2	2	-	4
	• ELCn434 Mobile Communications.					
• ELCn 437 Satellite Communications						
Total		14	10	4	6	20

2.5.7 Conformity to the (SOU) and NARS Requirements

The Electronic Engineering and Communication Technology BSc program includes 63 courses of total 165 credit hours, equivalent to 258 contact hours in addition to training courses distributed along all summers. These courses are classified according to the requirements of the engineering sector of the supreme council of Universities (SCU) to the following subject areas:

	Achieved	Range
1) University Requirements	9.7 %	(6-10%)
2) Faculty/Institute requirements	24.24 %	(22-30%)
3) Requirements of the general specialization of the program	35.15 %	(30-35%)
4) Requirements of the specific specialization of the program	30.91 %	(20-30%)

The program credit hours were also classified according to the reference framework approved by the (SCU) on 2016 to the following subject areas:

	Achieved	Range
1) Social and Humanitarian Sciences	8.48 %	(8-10%)
2) Business Administration	3.03 %	(2-4%)
3) Mathematics and Basic Sciences	19.39 %	(18-22%)
4) Engineering Culture	5.45 %	(4-6%)
5) Basic Engineering Sciences	29.09 %	(25-30 %)
6) Applied Engineering and Design	29.7 %	(25-30 %)
7) Project & Industrial Training	4.85 %	(4-6%)

The collective credit hours are shown in the following table. This table shows that the Credit hours' distribution of the Electronic Engineering and Communication Technology BSc program agrees with the requirements of the Engineering Sector of the Supreme Council of Universities (SCU) as well as the the reference framework approved by the (SCU) on 2016.

Table 19: Credit hours distribution (Requirements and Areas)

	Subject Area							Total Credit Hours	Percentage	Requirements of the Engineering Sector Committee
	Hum. & Soc. Sc.	Business Admins.	Math. & B. Sc.	Engineering Culture	Basic Eng. Sc.	App. Eng. & Des.	Proj. & Ind. Training			
University Requirements (General cultural courses requirements)	12	4	-	-	-	-	-	16	9.7%	6-10%
Faculty/Institute requirements (Mathematics & Basic Science Courses)	-	1	22	7	9	1	-	40	24.24%	22-30%
Requirements of the general specialization of the program (Basic Engineering Courses)	2	-	10	1	24	18	3	58	35.15%	30-35%
Requirements of the specific specialization of the program (Applied Engineering and Design)	-	-	-	1	15	30	5	51	30.9%	20-30%
Total Credit Hours	14	5	32	9	48	49	8	165		
Percentage	8.48%	3.03%	19.39%	5.45%	29.09%	29.7%	4.85%			
Requirements for subject areas%	8--10%	2--4 %	18--22 %	4--6%	25--30%	25--30%	4--6%			

2.6. Course Competences / Program Competences Mapping

The contribution of the individual courses to the program competences are indicated in the courses specifications and revised following the evaluation of the mapping matrix.

Table 20: Course Competences/ Program Competences Mapping

Sr	Courses		Program Competences																	
	Code	Title	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	CMPn010	Program Design and Computer Languages.	1	1	1	1	1	1	1	1	1	1								
2	GENn041	Contemporary Social Issues		1	1	1	1		1	1	1	1								
3	MNFn001	Engineering Graphics 1	1	1	1	1	1	1	1	1	1	1								
4	GENn043	History of Engineering and Technology							1	1	1	1								
5	MECn001	Mechanics -1.	1				1		1	1	1	1								
6	MTHn001	Mathematics -1 (Algebra and Calculus)	1				1		1	1	1	1								
7	PHYn001	Physics -1	1	1	1	1	1	1	1	1	1	1								
8	CHEn001	Chemistry.	1	1	1	1	1	1	1	1	1	1								
9	MNFn002	Engineering Graphics 2	1	1	1	1	1	1	1	1	1	1								
10	GENn042	English Language.					1			1	1	1								
11	MECn002	Mechanics-2	1				1		1	1	1	1								
12	MTHn002	Mathematics -2 (Integration and Analytic Geometry)	1	1			1		1	1	1	1								
13	PHYn002	Physics-2.	1	1	1	1	1		1	1	1	1								
14	MNFn003	Principles of Production Engineering	1	1	1	1	1	1	1	1		1								
15	ELCn060	Summer Training for level zero	1		1	1	1			1		1				1	1	1		
16	ELCn111	Electrical Circuit Analysis-1	1	1		1	1	1	1	1	1				1		1		1	1
17	CMPn111	Logic Circuits Design-1.	1	1	1		1		1	1	1	1		1	1	1	1	1	1	1
18	ELCn114	Modern Theory of solids	1	1	1	1	1		1	1	1	1				1	1	1	1	

19	MTHn103	Mathematics -3 (Differential Equations & Transforms).	1	1			1		1	1	1	1								
20	GENn141a	Presentation Skills.					1		1	1	1	1								
21	ENGN311a	Engineering Economy	1	1	1	1	1		1	1	1	1								
22	CMPn110	Data Structures and Algorithms.	1	1	1					1			1	1			1	1	1	1
23	ELCn112	Electrical Circuit Analysis-2	1				1		1		1	1			1	1			1	
24	ELCn113	Electrical Measurements.	1	1	1	1	1	1	1	1	1	1		1	1	1				
25	GENn142	Technical Report Writing					1	1		1										
26	MTHn104	Mathematics -4 (Advanced Calculus)	1				1		1	1	1	1								
27	ELCn115	Semiconductors for Microelectronics	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
28	ELCn160	Summer Training for level one			1	1	1	1	1	1	1	1			1	1	1			
29	GENn341a	Project Management.	1	1	1	1	1	1	1	1	1	1								
30	ELCn210	Control-1 (Principles of Automatic Control).	1	1	1		1					1	1	1	1	1			1	1
31	ELCn212	Microelectronic Circuits-1	1	1	1		1		1	1	1	1		1						
32	CMPn210	Engineering Computer Applications	1	1	1	1	1			1			1	1	1				1	
33	MTHn107	Mathematics -7 (Introduction to Probability. and Statistics). (Introduction to Probability & Statistics).	1	1			1		1	1	1	1								
34	ELCn211	Signal Analysis	1	1			1		1	1	1	1							1	
35	ELCn214	Electronic Measurements	1	1	1	1			1	1	1	1		1	1	1				

36	ELCn218	Electrical Power Engineering.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
37	ELCn215	Communications -1	1		1		1		1	1	1	1	1		1			1	1
38	ELCn213	Microelectronic Circuit-2	1	1	1		1		1	1		1	1	1	1	1		1	
39	MTHn208	Mathematics -8 (Complex Analysis and P.D.E)	1				1		1	1	1	1							
40	ELCn261	Seminar					1		1	1		1							
41	ENGN213a	Advanced Computer Systems Implementation.		1	1		1	1	1	1		1	1		1	1		1	
42	ELCn260	Industrial Training -1		1			1				1		1					1	
43	ELCn321	Communications-2.	1		1		1		1	1	1	1	1	1	1	1		1	1
44	ELCn323	Electromagnetic Field Theory.	1	1	1		1				1		1	1	1	1			
45	CMPn310	Microprocessor Based Systems.	1	1	1	1	1		1			1	1	1		1			
46	ELCn361	Project-1		1		1	1		1	1	1	1	1	1	1	1	1	1	1
47	ENGN312a	Engineering Laws and Professional ethics.		1	1	1	1	1	1	1	1	1							
48	GENn351a	Elective1 Technical English	1	1			1		1	1	1								
49	GENn352	Elective1 Risk Management		1	1	1	1	1	1	1	1	1							
50	GENn353	Elective1 Industrial Psychology			1	1	1		1	1	1	1							
51	ELCn320	Control-2 (Digital and PLC Control)	1	1	1		1		1	1	1	1	1	1	1	1	1	1	1
52	ELCn324	Microwave Engineering.	1		1		1		1	1	1	1	1	1	1			1	1
53	ELCn331	Elective3 Very Large Scale Integrated Systems			1	1	1	1		1		1	1	1	1	1	1	1	1
54	ELCn332	Elective3 VHDL	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1

55	ELCn335	Elective3 Modern Telephone Central Offices			1	1			1							1	1	1		
56	ELCn333	Elective4 Radar Systems and Remote Sensing	1	1		1			1	1	1	1	1	1			1	1		
57	ELCn334	Elective4 Advanced Topics in Communications	1	1		1	1	1	1	1	1					1				
58	CMPn321	Elective4 Computer architecture	1						1	1	1	1	1	1			1			
59	GENn451a	Elective2 Environmental Effects of Electromagnetic Waves.		1	1	1	1	1	1	1	1	1								
60	GENn452a	Elective2 Civilization and heritage	1		1				1	1	1	1								
61	GENn453	Elective2 Marketing	1	1					1	1	1	1								
62	ELCn360	Industrial Training -2		1	1			1				1		1					1	
63	ELCn425	Digital Signal Processing.		1			1		1	1		1	1	1		1	1	1	1	
64	ELCn422	Communications-3 (Information Theory and Coding)	1	1	1	1	1	1		1		1		1					1	
65	ELCn460	Project-2 a		1	1			1				1		1					1	
66	ELCn424	Radio and Television Engineering Systems.	1	1	1		1	1		1	1	1	1	1	1				1	1
67	ELCn431	Elective5 Optical Fiber Communications	1		1		1		1	1	1	1	1	1	1	1	1	1	1	1
68	ELCn432	Elective5 Microwave Circuits and Devices	1				1				1		1	1	1	1	1	1	1	1
69	ELCn438	Elective5 Acoustics			1	1			1							1	1	1		

70	ELCn421	Antennas and Wave Propagation.	1		1		1			1	1	1	1	1	1	1			1	1
71	ELCn423	Communications-4 (Advanced Communications Systems)	1	1	1	1	1	1		1	1		1	1	1			1		1
72	ELCn461	Project-2 b		1	1			1					1	1					1	
73	ELCn433	Elective6 Communication Networks			1		1			1				1			1		1	
74	ELCn434	Elective6 Mobile Communications.			1		1			1							1	1	1	
75	ELCn437	Elective6 Satellite Communications			1		1			1							1	1	1	
Number of Contributing Courses			50	47	49	29	68	29	47	63	41	59	23	29	30	27	22	19	29	15
Percentage of Contributing Courses			67	63	65	39	91	39	63	84	55	79	31	39	40	36	29	25	39	20

The contribution of the individual courses to the program competences 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.

2.7. Courses Specifications

The detailed program courses specifications are given in **Appendix 1**. These courses specifications were revised and approved on **August 2020**. The contribution of each course to the program competencies 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 the first year for all students before specialization in different disciplines. Students' departmental allocation is in accordance with the student's desire and 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. Teaching, learning and assessment Methods

Teaching Methods

- Lecture – Tutorials - Lab. Experiments – Projects - Problem solving - Brain storming – Sketches.

Learning Methods

- Modeling & Simulation – Researches & Reports – Discovering – Cooperative - Self-learning.

Assessment Method

- Written Exam – Practical Exam- Quizzes - Term papers - Research & Presentations- Assignments.

6. Evaluation of Quality of teaching and learning

Evaluator	Tool
1- Senior students	Questionnaires
2- Alumni	Questionnaires
3- Stakeholders	Questionnaires
4- External Evaluator(s) (External Examiner (s))	Reports
5- Other societal parties	Questionnaires

Appendix 1 Courses Specifications

The courses of the Electronic Engineering and communication Technology BSc Program are given in Table A2-1, Followed by the course's description.

Table 1-1 Electrical Engineering and Communication Technology BSc Program Courses

SN	Course Code	Course Title	Note
1.	CMPn010	Program Design and Computer Languages.	
2.	GENn041	Contemporary Social Issues	
3.	MNFn001	Engineering Graphics 1	
4.	GENn043	History of Engineering and Technology	
5.	MECn001	Mechanics -1.	
6.	MTHn001	Mathematics -1 (Algebra and Calculus)	
7.	PHYn001	Physics -1	
8.	CHEn001	Chemistry.	
9.	MNFn002	Engineering Graphics 2	
10.	GENn042	English Language.	
11.	MECn002	Mechanics-2	
12.	MTHn002	Mathematics -2 (Integration and Analytic Geometry)	
13.	PHYn002	Physics-2.	
14.	MNFn003	Principles of Production Engineering	
15.	ELCn060	Summer Training for level zero	Oral P/F
16.	ELCn111	Electrical Circuit Analysis-1	
17.	CMPn111	Logic Circuits Design-1.	
18.	ELCn114	Modern Theory of solids	
19.	MTHn103	Mathematics -3 (Differential Equations & Transforms).	
20.	GENn141a	Presentation Skills.	
21.	ENGN311a	Engineering Economy	
22.	CMPn110	Data Structures and Algorithms.	
23.	ELCn112	Electrical Circuit Analysis-2	
24.	ELCn113	Electrical Measurements.	
25.	GENn142	Technical Report Writing	
26.	MTHn104	Mathematics -4 (Advanced Calculus)	
27.	ELCn115	Semiconductors for Microelectronics	
28.	ELCn160	Summer Training for level one	Oral P/F
29.	GENn341a	Project Management.	
30.	ELCn210	Control-1 (Principles of Automatic Control).	
31.	ELCn212	Microelectronic Circuits-1	
32.	CMPn210	Engineering Computer Applications	
33.	MTHn107	Mathematics -7 (Introduction to Probability. and Statistics).	
34.	ELCn211	Signal Analysis	
35.	ELCn214	Electronic Measurements	
36.	ELCn218	Electrical Power Engineering.	
37.	ELCn215	Communications -1	

38.	ELCn213	Microelectronic Circuit-2	
39.	MTHn208	Mathematics -8 (Complex Analysis and P.D.E)	
40.	ELCn261	Seminar	Oral
41.	ENGN213a	Advanced Computer Systems Implementation	
42.	ELCn260	Industrial Training -1	
43.	ELCn321	Communications-2.	
44.	ELCn323	Electromagnetic Field Theory.	
45.	CMPn310	Microprocessor Based Systems.	
46.	ELCn361	Project-1	
47.	ENGN312a	Engineering Laws and Professional ethics.	
48.	GENn351a	Elective1 Technical English	Only one course
49.	GENn352	Elective1 Risk Management	
50.	GENn353	Elective1 Industrial Psychology	
51.	ELCn320	Control-2 (Digital and PLC Control)	
52.	ELCn324	Microwave Engineering.	
53.	ELCn331	Elective3 Very Large Scale Integrated Systems	Only one course
54.	ELCn332	Elective3 VHDL	
55.	ELCn335	Elective3 Modern Telephone Central Offices	
56.	ELCn333	Elective4 Radar Systems and Remote Sensing	Only one course
57.	ELCn334	Elective4 Advanced Topics of Communication	
58.	CMPn321	Elective4 Computer architecture	
59.	GENn451a	Elective2 Environmental Effects of Electromagnetic Waves.	Only one course
60.	GENn452a	Elective2 Civilization and heritage	
61.	GENn453	Elective2 Marketing	
62.	ELCn360	Industrial Training -2	
63.	ELCn425	Digital Signal Processing.	
64.	ELCn422	Communications-3 (Information Theory and Coding)	
65.	ELCn460	Project-2 a	
66.	ELCn424	Radio and Television Engineering Systems.	
67.	ELCn431	Elective5 Optical Fiber Communications	Only one course
68.	ELCn432	Elective5 Microwave Circuits and Devices	
69.	ELCn438	Elective5 Acoustics	
70.	ELCn421	Antennas and Wave Propagation.	
71.	ELCn423	Communications-4 (Advanced Communications Systems)	
72.	ELCn461	Project-2 b	
73.	ELCn433	Elective6 Communication Networks	Only one course
74.	ELCn434	Elective6 Mobile Communications.	
75.	ELCn437	Elective6 Satellite Communications	

Modern Academy

for Engineering and Technology in Maadi



Course Specification

CMPn010: Program Design and Computer Languages

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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Computer Engineering and Information Technology Department.

Date of specifications approval:

August 2020

B - Basic Information

Title: Program Design and Computer Languages

Code: CMPn010

Level: Freshman / Fall

Credit Hours: 4

Lectures: 2

Tutorial/Exercise: 3

Practical: 2

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences related to the construction and operation 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). also takes up various programming techniques such as design, implementation, testing, troubleshooting and documentation.

2 – Competencies

- c1. use programming methodologies to design and implement programs. (C1, C2, C3)
- c2. Utilize codes of practice and contemporary technologies of programming(C4, C7)
- c3. explain fundamental concepts such as classes, information hiding, constructors, methods and other related, object-oriented concepts (C9, C10),
- c4. Practice research to updates new algorithms and method of programming (C5. C8)
- c5. understand dynamic and static memory management(C3)
- c6. Plan, supervise and carry out testing and troubleshooting (C6)
- c7 explain how to compile and run programs (C2, C3).
- c8 Acquire and apply new application programs; and practice self-learning (C10)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C6, C7, C8, C9 &C10**

3. Contents

Weeks	Topic	Lecture hours	Tutorial hours	Practical hours
1.	Steps for solving programs by computer programs	2	3	2
2.	Program documentation and flow charts	2	3	2
3.	Program structure in C++	2	3	2
4.	Data types and declaration in C++	2	3	2
5.	Input/output in C++ and I/O stream class, I/O manipulation	2	3	2
6.	Operators and precedence in C++, Decision (Selection) Constructs in C++	2	3	2
7.	Assessment (M.T)	2	3	2
8.	Loops (Iterations) in C++	2	3	2
9.	Arrays, Pointers, References, and dynamic allocation	2	3	2
10.	Functions in C++, calling functions (by value, by reference)	2	3	2
11.	Structures, Unions, Enumeration, and user-defined data types	2	3	2
12.	Abstract data types (ADT), Concepts and Terminologies of Object-Oriented Programming (OOP)	2	3	2
13.	Classes and objects	2	3	2
14.	Constructors, destructors, friend functions	2	3	2
15.	Polymorphism, encapsulation, inheritance,	2	3	2
Total hours		30	45	30

4. Course content/Course Competencies mapping matrix:

Topics	c1	c2	c3	c4	c5	c6	c7	c8
Steps for solving programs by computer programs	1						1	1
Program documentation and flow charts	1							1
Program structure in C++	1			1				
Data types and declaration in C++		1						
Input/output in C++ and I/O stream class, I/O manipulation				1		1	1	
Operators and precedence in C++, Decision (Selection) Constructs in C++		1		1				
Assessment (M.T)	1		1			1	1	
Loops (Iterations) in C++								
Arrays, Pointers, References, and dynamic allocation				1	1			
Functions in C++, calling functions (by value, by reference)			1	1		1	1	
Structures, Unions, Enumeration, and user-defined data types			1					

Abstract data types (ADT), Concepts and Terminologies of Object-Oriented Programming (OOP)		1	1	1	1			1
Classes and objects, Constructors, destructors, friend functions		1	1	1		1		
, Polymorphism, encapsulation, inheritance,		1	1	1				
carry out testing and troubleshooting						1		1
Total	4	5	6	8	2	5	4	4

5 - Teaching and Learning and Assessment methods:

Course Competences	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1	1	1				1		1	1		1
c2	1			1	1	1				1		1	1		1
c3	1			1	1	1				1		1	1		1
c4	1			1	1	1				1		1	1		1
c5	1			1	1	1	1	1		1		1	1		1
c6	1			1	1	1	1	1		1		1	1		1
c7	1			1	1	1	1	1		1		1	1		1
c8	1			1			1	1							
Σ	8			8	7	7	4	4	-	7	-	7	7	-	7

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Lecture notes and handouts

7-2 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.

7-3 Recommended books:

- C++ Essentials, Sharam Hekmat, (2005) Programming Soft Corporation, www.pragsoft.com,

7-4 Periodicals, Web sites, etc.:

- <http://www.cplusplus.com/>.

7-5 Facilities required for teaching and learning:

- Computer Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Ehab El-Shimy

Head of the Department:

Dr. Abdel-Moneam Foda

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

GENn041: Contemporary Social Issues

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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic information

Title Contemporary Social Issues:

Code: GENn041

Level: ZREO

Credit Hours: 2

Lectures: 2

Tutorial/Exercise: -

Practical: -

Pre-requisite: non

C - Professional information

1 – Course Learning Objectives:

في نهاية هذا المقرر يكون الطالب قد استوعب وحل وطبق المعلومات والمعرفة بالاتي العلوم الانسانية واهميه دراستها وأصول المجتمع وبناء الأسرة و تكوينها والمكونات الاجتماعية والاقتصادية للمجتمع وأساليب القيادة وكيفية إعداد القادة وكذلك أساليب التفاوض وصفات الشخصية المفاوضة وكذلك مهارات العمل الجماعي وأهمية الفارق بين العمل الجماعي والفردى. كذلك التعرف علي بعض المشكلات الاجتماعية التي تظهر في الحياة العملية. و كذلك يدرك معنيا لانتفاء، أهميته - أصول المجتمع - العادات والتقاليد المرعية - المواطنة - العوامل المحفزة لحب الوطن (الحرية - احترام الرأي الآخر - عدم التمييز العنصري - الديمقراطية). وكذلك التخطيط والسكان والصحة الإنجابية .

2 – Competencies

c1- يدرس مفهوم العلوم الانسانية واهميه دراستها وانواعها -C7,C8,C9)

c2 يتعرف علي بناء الأسرة و تكوينها وتعريف التنشئة الاجتماعية والعوامل المؤثرة فيها- (C7,C8 ,C9)

c3- يتعرف علي مفهوم القيادة والفرق بين القيادة والرئاسة وانواع القيادة (C8, C9)

c4- يتعرف علي معني التفاوض وصفات الشخصية المفاوضة والمفاهيم التي تتداخل مع مفهوم التفاوض- (C8,C9,C10)

c5- يكون الطالب قادر علي معرفة معني الراي العام واهميه وسائل الاعلام والوسائل المستخدمة لقياس هذا المفهوم- (C8,C9)

c6- يتعرف علي مفهوم النفاق والكذب والفرق بينهم وتأثير هذه الصفة علي المجتمع - (C8,C9,C10)

c7- يمارس مهارات العمل الجماعي و الفردي خلال الدراسة- (C5,C9,C10)

c8- يدرس منهجيات حل المشاكل الهندسية ، وجمع البيانات وتفسيرها (C4, C8)

c9- يبحث الطالب علي المعلومات من خلال شبكة المعلومات والمراجع- (C5,C9)

c10- تدريب الطالب على التفكير و ايجاد التصميمات اللازمة لخلق كل ما هو جديد- (C7,C8,C10).

c11- يكتسب الطالب الخبرة في ايجاد حلول عملية تخدم برامج خارج تخصصه- (C7,C8).

c12- يكتسب الطالب كيفية وضع المعايير اللازمة لتكوين فريق بحثي متكامل- (C10,C2,C3)

This course contributes in the following program competencies: C2, C3, C4, C5, C7, C8, C9, & C10.

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	تعريف العلوم الانسانية واهمية دراستها وانواعها	2	-	-
2	تعريف التنشئة الاجتماعية والعوامل المؤثرة في هذه عملية التنشئة الاجتماعية	2	-	--
3	تعريف التنشئة الاجتماعية والعوامل المؤثرة في هذه عملية التنشئة الاجتماعية	2		
4	تعريف القيادة والفرق بين القيادة والرئاسة	2	-	-
5	السمات الشخصية للقائد ووظائفه واساليب القيادة ومفهوم القيادة والمواقف	2		
6	المفهوم اللغوي والاصطلاحي للتفاوض واهمية التفكير واللغة لاتمام عملية التفاوض وخصائص الشخصية المفاوضة	2	-	-
7	امتحان منتصف الفصل	2		
8	وسائل الاعلام والسلوك الاجتماعي ومفهوم الراي العام ووسائل قياس الراي العام	2	-	-
9	تعريف القيادة والفرق بين القيادة والرئاسة والسمات الشخصية للقائد ووظائفه واساليب القيادة ومفهوم القيادة والمواقف	2		
10	المنافق والسلوك الاجتماعي ومفهوم النفاق والفرق بين النفاق والكذب ودور المنافقين في العلاقات الاجتماعية	2		
11	المنافق والسلوك الاجتماعي ومفهوم النفاق والفرق بين النفاق والكذب ودور المنافقين في العلاقات الاجتماعية	2		
12	اللغة وعلاقتها بالبعد الاجتماعي	2		
13	القيم وطرق التعرف علي القيم وتأثيرها علي المجتمع	2		
14	مناقشة ابحاث علي الموضوعات السابقه	2		
15	مراجعة واجراء امتحان	2		
Total hours		30	-	-

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
تعريف العلوم الانسانية واهمية دراستها وانواعها	1							1	1	1	1	1
تعريف التنشئة الاجتماعية والعوامل المؤثرة في هذه عملية التنشئة الاجتماعية		1						1	1	1	1	1
تعريف القيادة والفرق بين القيادة والرئاسة والسمات الشخصية للقائد ووظائفه واساليب القيادة ومفهوم القيادة والمواقف			1		1	1	1	1	1	1	1	1
المفهوم اللغوي والاصطلاحي للتفاوض واهمية التفكير واللغة لاتمام عملية التفاوض وخصائص الشخصية المفاوضة				1				1	1	1	1	1
وسائل الاعلام والسلوك الاجتماعي ومفهوم الراي العام ووسائل قياس الراي العام					1			1	1	1	1	1
المنافق والسلوك الاجتماعي ومفهوم النفاق والفرق بين النفاق والكذب ودور المنافقين في العلاقات الاجتماعية						1		1	1	1	1	1
اللغة وعلاقتها بالبعد الاجتماعي	1			1								
القيم وطرق التعرف علي القيم وتأثيرها علي المجتمع	1			1	1						1	1
Topics Covering Competences	3	1	1	3	1	3	1	6	6	6	7	7

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1	
c5	1	1	1				1	1		1			1	1	
c6	1	1	1				1	1		1			1		
c7	1	1	1				1	1		1			1	1	
c8	1	1											1	1	
c9	1	1						1		1			1	1	
c10	1		1				1	1						1	
c11	1		1				1	1					1	1	
c12	1		1				1	1					1	1	
Σ	12	8	10	0	0	0	10	11	0	8			11	12	

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments	Bi-Weekly	20
Quizzes	13 th and 14 th	20
Mid-Term Exam	7 th Week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes :

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

7-2 Required books

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

7-3 Recommended books: None

7-4 Periodicals, Web sites, etc.:

www.bvsci.com mawdoo3.com www.aspdkw.com

8- Facilities required for teaching and learning:

- Computer,
- Data show
- Computer programs
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Shimaa Nabih Ebrahim Esmail

Head of the Department:

Prof. Dr. Ashraf Taha

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

MNFn001: Engineering Graphics 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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Manufacturing Engineering and Production Technology Department.

Date of specifications approval:

August 2020

B - Basic Information

Title: Engineering Graphics

Code: MNFn001

Level: Freshman, first semester

Credit Hours: 2

Lectures: 1

Tutorial/Exercise: 3

Practical: -

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of the course, students should know to read and draw components in different drawing kinds, namely orthogonal, perspective and/or isometric drawings. The students will be able to apply the dimensioning principles on the drawings.

2 – Competencies:

- c1. Solve and communicate problems in orthographic views and isometric and oblique drawings (C2, C3, C7, C8, C9).
- c3. Consider the benefits of solving problems of developments and intersections and draw different problems in sectional views. (C3, C4, C8, C9)
- c5. Select the proper section for each component and draw dimensions for components from production point of view. (C1, C4, C5, C8)
- c7. Produce orthographic views from 3D models. (C6, C9, C10)
- c8. Read and understand orthographic drawing and prepare and interpret engineering drawing. (C1, C8, C14)
- c10. Read orthographic drawing with multi views and make necessary views using multi view and isometric. (C3, C5, C6, C9, C10)
- c12. Use the graphic language and communicate effectively with other discipline using the graphical language (C1, C5)
- c14. Expand their creative talents and to communicate their ideas in a meaningful manner. (C8, C9, C10)
- c15. Search for information and engage in life – long self learning discipline. (C8, C10)
- c16. Use graphically effectively. (C8, C9)
- c17. Refer to relevant literature. (C9, C10)
- c18. Search for information's in references and in internet and practice self-learning and continuous learning (C5, C8, C9, C10).

This course contributes to the following program competencies: **C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10**

3 – Contents:

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	Drawing instruments, draw sheets; Scales; Folding, Lettering.	1	3	-
2	Geometric Construction.	1	3	-
3	Alphabet of lines.	1	3	-
4	Theory of orthographic projection: Projection of point; line and plane Projection of geometric solids.	1	3	-
5	Multi view drawing (of Vertical and Horizontal Surfaces).	1	3	-
6	Multi view drawing (of inclined Surfaces).	1	3	-
7	Assessment (Mid-Term Exam)	1	1	-
8	Multi view drawing (of cylindrical Surfaces).	1	3	-
9	Practices of multi view in all cases.	1	3	-
10	Pictorial drawing (isometric), Pictorial drawing (oblique).	1	3	-
11	Isometric drawing (of Vertical, Horizontal).	1	3	-
12	Isometric drawing (of inclined Surfaces).	1	3	-
13	Isometric drawing (of cylindrical Surfaces).	1	3	-
14	Practices of Isometric drawing in all cases.	1	3	-
15	Conventional practice in ED.	1	5	-
Total hours		15	45	-

4 – Course content/Course Competencies mapping matrix:

Topics	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
1- Drawing instruments, draw sheets; Scales; Folding, Lettering.	1			1		1						
2- Geometrical constructions	1				1	1	1			1	1	
3- Alphabet of lines.		1			1	1	1	1	1	1	1	1
4- Theory of orthographic projection: Projection of point; line and plane Projection of geometric solids.	1	1			1	1	1	1	1	1	1	1
5- Multi view drawing (of Vertical and Horizontal Surfaces).	1	1			1	1	1					
6- Multi view drawing (of inclined Surfaces).		1	1			1	1			1	1	1
7- Multi view drawing (of cylindrical Surfaces).		1	1			1				1	1	1
8- Practices of multi view in all cases.	1		1			1		1	1			
9- Pictorial drawing (isometric), Pictorial drawing (oblique).		1	1			1	1	1	1	1	1	1
10- Isometric drawing (of Vertical, Horizontal).		1	1		1	1	1			1	1	1
11- Isometric drawing (of inclined Surfaces).		1	1			1	1	1	1	1	1	1
12- Isometric drawing (of cylindrical Surfaces).				1	1	1	1			1		
13- Practices of Isometric drawing in all cases.				1	1	1	1			1		
14- Conventional practice in ED.				1	1	1	1			1		
Topics Covering Competencies	5	8	6	4	8	14	11	5	5	11	8	7

5 – Teaching, Learning, and Assessment Methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1	1		1	1		1	1		1		
c2	1		1	1	1	1	1	1	1	1	1	1	1	1	
c3	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	1		1	1	1
c6			1		1	1	1		1			1			
c7						1	1		1			1			
c8	1	1	1					1					1	1	1
c9	1	1	1					1							
c10		1	1					1							
c11	1	1	1					1						1	1
c12	1										1		1	1	
Σ	9	6	7	4	5	4	6	7	6	5	6	4	6	6	3

6 – Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes per semester	20
	Tutorials	3 Assignments per semester	20
Written Exam		16th Week	40
Total			100

7 – List of references:

7-1 Course notes:

- Engineering Graphics by Prof. Nabil Gadallah.

7-2 Required books

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

7-3 Recommended books

- None

7-4 Recommended Web Site

- None

8 – Facilities required for teaching and learning:

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

Course coordinator: Dr. Metwally Abd Elghaffar
Head of the Department: Dr. Metwally Abd Elghaffar
Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification MNFn001: Engineering Graphics 1

A- Affiliation

Relevant program:

Manufacturing Engineering and Production Technology BS c program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Manufacturing Engineering and Production Technology Department.

Date of specifications approval:

August 2020

B - Basic Information

Title: Engineering Graphics

Code: MNFn001

Level: Freshman, first semester

Credit Hours: 2

Lectures: 1

Tutorial/Exercise: 3

Practical: -

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of the course, students should know to read and draw components in different drawing kinds, namely orthogonal, perspective and/or isometric drawings. The students will be able to apply the dimensioning principles on the drawings.

2 – Competencies:

- c1. Solve and communicate problems in orthographic views and isometric and oblique drawings (C2, C3, C7, C8, C9).
- c3. Consider the benefits of solving problems of developments and intersections and draw different problems in sectional views. (C3, C4, C8, C9)
- c5. Select the proper section for each component and draw dimensions for components from production point of view. (C1, C4, C5, C8)
- c7. Produce orthographic views from 3D models. (C6, C9, C10)
- c8. Read and understand orthographic drawing and prepare and interpret engineering drawing. (C1, C8, C14)
- c10. Read orthographic drawing with multi views and make necessary views using multi view and isometric. (C3, C5, C6, C9, C10)
- c12. Use the graphic language and communicate effectively with other discipline using the graphical language (C1, C5)
- c14. Expand their creative talents and to communicate their ideas in a meaningful manner. (C8, C9, C10)
- c15. Search for information and engage in life – long self learning discipline. (C8, C10)
- c16. Use graphically effectively. (C8, C9)
- c17. Refer to relevant literature. (C9, C10)
- c18. Search for information's in references and in internet and practice self-learning and continuous learning (C5, C8, C9, C10)

This course contributes to the following program competencies: **C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10**

3 – Contents:

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	Drawing instruments, draw sheets; Scales; Folding, Lettering.	1	3	-
2	Geometric Construction.	1	3	-
3	Alphabet of lines.	1	3	-
4	Theory of orthographic projection: Projection of point; line and plane Projection of geometric solids.	1	3	-
5	Multi view drawing (of Vertical and Horizontal Surfaces).	1	3	-
6	Multi view drawing (of inclined Surfaces).	1	3	-
7	Assessment (Mid-Term Exam)	1	1	-
8	Multi view drawing (of cylindrical Surfaces).	1	3	-
9	Practices of multi view in all cases.	1	3	-
10	Pictorial drawing (isometric), Pictorial drawing (oblique).	1	3	-
11	Isometric drawing (of Vertical, Horizontal).	1	3	-
12	Isometric drawing (of inclined Surfaces).	1	3	-
13	Isometric drawing (of cylindrical Surfaces).	1	3	-
14	Practices of Isometric drawing in all cases.	1	3	-
15	Conventional practice in ED.	1	5	-
Total hours		15	45	-

4 – Course content/Course Competencies mapping matrix:

Topics	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
1- Drawing instruments, draw sheets; Scales; Folding, Lettering.	1			1		1						
2- Geometrical constrictions	1				1	1	1			1	1	
3- Alphabet of lines.		1			1	1	1	1	1	1	1	1
4- Theory of orthographic projection: Projection of point; line and plane Projection of geometric solids.	1	1			1	1	1	1	1	1	1	1
5- Multi view drawing (of Vertical and Horizontal Surfaces).	1	1			1	1	1					
6- Multi view drawing (of inclined Surfaces).		1	1			1	1			1	1	1
7- Multi view drawing (of cylindrical Surfaces).		1	1			1				1	1	1
8- Practices of multi view in all cases.	1		1			1		1	1			
9- Pictorial drawing (isometric), Pictorial drawing (oblique).		1	1			1	1	1	1	1	1	1
10- Isometric drawing (of Vertical, Horizontal).		1	1		1	1	1			1	1	1
11- Isometric drawing (of inclined Surfaces).		1	1			1	1	1	1	1	1	1
12- Isometric drawing (of cylindrical Surfaces).				1	1	1	1			1		
13- Practices of Isometric drawing in all cases.				1	1	1	1			1		
14- Conventional practice in ED.				1	1	1	1			1		
Topics Covering Competencies	5	8	6	4	8	14	11	5	5	11	8	7

5 – Teaching, Learning, and Assessment Methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1	1		1	1		1	1		1		
c2	1		1	1	1	1	1	1	1	1	1	1	1	1	
c3	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	1		1	1	1
c6			1		1	1	1		1			1			
c7						1	1		1			1			
c8	1	1	1					1					1	1	1
c9	1	1	1					1							
c10		1	1					1							
c11	1	1	1					1						1	1
c12	1										1		1	1	
Σ	9	6	7	4	5	4	6	7	6	5	6	4	6	6	3

6 – Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes per semester	20
	Tutorials	3 Assignments per semester	20
Written Exam		16 th Week	40
Total			100

7 – List of references:

7-1 Course notes:

- Engineering Graphics by Prof. Nabil Gadallah.

7-2 Required books

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

7-3 Recommended books

- None

7-5 Recommended Web Site

- None

8 – Facilities required for teaching and learning:

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

Course coordinator: Dr. Metwally Abd Elghaffar
Head of the Department: Dr. Metwally Abd Elghaffar
Date: August 2020

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
Civil Engineering and Building Technology BSc program

Department offering the program:

E Manufacturing Engineering and Production Technology Department
Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department
Architecture Engineering and Building Technology Department
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic information

Title: History of Science and Technology **Code:** GENn043 **Level:** Zero

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

C – Professional information

1 – Course Learning Objectives:

مع نهاية تدريس هذا المقرر يكون الطالب قد اكتسب المهارات التي تمكنه من فهم تاريخ الهندسة و التكنولوجيا في مختلف العصور والفرق بين كل من العلم و الهندسة و التكنولوجيا – نقل التكنولوجيا – نشاطات العمل الهندسي و مسؤوليات المهندس- امثلة على تطور اوجه النشاط الهندسي و التكنولوجي و أشهر علماء الهندسة كنماذج يحتذى بها.

2 – Competencies

- C1- يتعرف علي مفهوم العلم و الهندسة و التكنولوجيا و علاقتهم ببعضهم البعض و كيفية ابتكار معدات و منظومات تحقق احتياجات المجتمع طبقا لتلك المفاهيم (C7,C9).
- C2- درس المعلومات التاريخية عن مهنة الهندسة و التكنولوجيا وكذا العلاقة بين مسمى المعهد او الكلية و بين ما يتم دراسته (C7,C8,C9)
- C3- يدرس مفهوم التعليم الهندسي و مجالات العمل للمهندسين و كيفية القيد و التسجيل بنقابة المهندسين و كذا حقوق و واجبات المهندس (C7,C8,C9)
- C4- يتعرف علي تطور اوجه النشاط الهندسي و التكنولوجي و ايضا التعرف على الطرق المختلفة لنقل التكنولوجيا (C7,C8,C9).
- C5- يكتسب الطالب مهارات توظيف النظريات و المعارف و البيانات و الافكار لابتكار معدات و منظومات متطورة (C7,C8,C9)
- C6- يستخدم الطالب المنهج العلمي في التفكير وصولا لتصميم و تركيب الفروض (C7,C8,C10)
- C7- يستطيع الطالب التفكير في حل مشكلة ما من خلال تفهمه لموضوعات الهندسة العكسية (C7,C9)
- C8- يستطيع الطالب اتخاذ القرار السليم و اختيار انسب الحلول من خلال دراسته لنماذج و امثلة من المشاكل الهندسية و عرض الحلول الممكنة لها (C7,C8,C9,C10)
- C9- يتعرف الطالب بمعايير الجودة و نظم الامان في استخدام المنظومات الهندسية. (C10)
- C10- تدريب الطالب على التفكير و ايجاد التصميمات اللازمة لخلق كل ما هو جديد. (C7,C8,C10).
- C11- يكتسب الطالب الخبرة في ايجاد حلول عملية تخدم برامج خارج تخصصه. (C7,C10)
- C12- يكتسب الطالب كيفية وضع المعايير اللازمة لتكوين فريق بحثي متكامل (C10)

his course contributes in the following program competencies: **C7, C8, C9,C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	العلم و الهندسة و التكنولوجيا	2		
2	الهندسة و البحث العلمى – منظومة البحث العلمى	2		
3	عناصر و متطلبات البحث العلمى	2		
4	الهندسة و خريطة البحث العلمى – مراحل البحث العلمى	2		
5	تاريخ الهندسة و التكنولوجيا فى مختلف العصور	4		
6	نقل التكنولوجيا	2		
7	امتحان منتصف الفصل	2		
8	نشاطات العمل الهندسى و مسؤوليات المهندس	2		
9	التعليم الهندسى	2		
10,11	نقابة المهندسين المصرية – جمعية المهندسين المصرية	4		
12,13	تطور اوجه النشاط الهندسى و التكنولوجى	4		
14,15	اشهر علماء الهندسة و التكنولوجيا	2		
Total hours		30		

4. Course content/Course Competencies mapping matrix

Topic	Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
العلم و الهندسة و التكنولوجيا	1							1	1	1	1	1
الهندسة و البحث العلمى – منظومة البحث العلمى						1		1	1	1	1	1
عناصر و متطلبات البحث العلمى				1				1	1	1	1	1
الهندسة و خريطة البحث العلمى – مراحل البحث العلمى	1	1				1		1	1	1	1	1
تاريخ الهندسة و التكنولوجيا فى مختلف العصور	1				1			1	1	1	1	1
نقل التكنولوجيا						1		1	1	1	1	1
نشاطات العمل الهندسى و مسؤوليات المهندس								1	1	1	1	1
التعليم الهندسى	1			1				1	1	1	1	1
نقابة المهندسين المصرية – جمعية المهندسين المصرية	1					1	1	1	1	1	1	1
تطور اوجه النشاط الهندسى و التكنولوجى	1			1			1	1	1	1	1	1
اشهر علماء الهندسة و التكنولوجيا	1		1		1			1	1	1	1	1
Topics Covering Competences	3	4	2	3	2	4	2	11	11	11	11	11

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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
c4	1	1	1				1	1		1			1	1	1
c5	1	1	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
c8	1	1											1	1	
c9	1	1						1		1			1	1	1
c10	1		1				1	1						1	
c11	1		1				1	1					1	1	
c12	1		1				1	1					1	1	
Σ	12	8	10	0	0	0	10	11	0	8			11	12	7

6- Assessment Timing and Grading:

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

7- List of references:

7-1 Course notes: -

Ghada Maher, History of Engineering and Technology, Lecture note, Modern Academy Press, 2019.

7-2 Required books: None

7-3 Recommended books

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

7-4 Periodicals, Web sites, etc.

مواقع الانترنت الخاصة بنقابه المهندسين المصرية

8- Facilities required for teaching and learning:

- Computer, Data show and projector.
- High speed internet and communication facilities for distance learning

Course coordinator: Dr. Marwa Mohamed Fouad

Head of the Department: Prof. Dr. Ashraf Taha

Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification MECn001: 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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Mechanics-1

Code: MECn001

Level: Zero

Credit Hours: 2

Lectures: 1

Tutorial/Exercise:3

Practical: ---

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge, skills, and attitudes) related to the basic concepts of statics in plane and space: (force resultant equilibrium analysis of structures).

2 – Competencies

- c1-Identify of the basic of statics in plane and space (C1,C5).
- c2- Identify the difference between the moment of force in plane and space (C1, C5).
- c3- Classification the support reaction in plane and in space (C1, C5).
- c4- Understand the structural analysis in plane (C1, C5).
- c5- Analyze and classify between equilibrium in plane and equilibrium in space (C1, C5, C9).
- c6- Classify and compare the different between equilibrium of a single rigid body and all forces involved were external to the rigid body (C1, C5, C9) .
- c7- Solve the equations of equilibrium to get three unknownes (C1, C9).
- c8- Solve the trusses to get the value of the forces in the structural by joints and by section methods (C1, C9).
- c9- Work in a team to solve problem as a search (C7, C8).
- c10- Search for information in references and in internet (C9, C7, C10)

This course contributes in the following program competencies: C1, C5, C7, C8, C9 & C10

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Basic Concepts of statics.	1	1	—
2	➤ Resultant of concurrent forces in plane	1	1	—
3	➤ Resultant of concurrent forces in space	1	3	—
4	➤ Equilibrium of a particle (in plane and in space)	1	1	—
5	➤ Different types of support in plane	1	2	—
6	➤ Distributed loads	1	2	—
7	➤ Mid term	1	2	—
8	➤ Equilibrium of rigid body in plane	1	2	—
9	➤ Different types of supports in space	1	3	—
10	➤ Equilibrium of rigid body in space	2	4	—
11	➤ Special cases of two, three and four force members	1	3	—
12	➤ Analysis of Trussess by the method of joints	1	3	—
13,14	➤ Analysis of Trussess by the method of section	1	2	—
15	➤ Final revision	1	1	—
Total hours		15	30	—

4. Course content/Course Competencies mapping matrix

Topic	Competencies									
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10
Basic Concepts of statics.	1	1								1
Resultant of concurrent forces in plane		1							1	1
Resultant of concurrent forces in space		1							1	1
Equilibrium of a particle (in plane and in space)			1				1		1	1
Different types of support in plane			1				1		1	1
Distributed loads			1				1		1	1
Equilibrium of rigid body in plane			1		1		1		1	1
Different types of supports in space			1		1		1		1	1
Equilibrium of rigid body in space			1		1		1		1	1
Special cases of two, three and four force members				1		1	1		1	1
Analysis of Trussess by the method of joints				1		1	1	1	1	1
Analysis of Trussess by the method of section				1		1	1	1	1	1
Final revision	1	1	1	1	1	1	1	1	1	1
Topics Covering Competences	2	4	7	4	4	4	10	3	12	13

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method			
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Term papers	Assignments
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	1
c4	1	1	1	1	1	1	1	1	1
c5	1	1	1			1	1		1
c6	1	1	1	1		1	1	1	1
c7	1	1	1	1		1	1	1	1
c8	1	1	1			1	1	1	1
c9				1	1			1	
c10					1			1	
Σ	8	5	8	7	5	8	8	9	8

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

Shimaa Lotfy and Moamen Wafaie, Engineering Mechanics (Statics), Lecture Notes, Modern Academy Press.

7-2 Required books:

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

7-3 Recommended books:

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

7-4 Periodicals, Web sites, etc.

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

8- Facilities required for teaching and learning:

- Library.
- Internet.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Moamen Wafaie

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

MTHn001: 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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Mathematics -1(Algebra and Calculus)

Code: MTHn001

Level: Zero

Credit Hours: 3

Lectures: 2

Tutorial/Exercise:3

Practical: ---

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this course, students will master basic differential calculus, linear algebra, Taylor expansion and binomial expansion and polar coordinates and their applications.

Students will be able to use the above concepts to solve physics and geometry problems.

Students will understand the usage of mathematical notation in relation to the above topics.

2 – Competencies

- c1- Identify rules of limits and continuity of functions of one variable. (C1)
- c2- Apply concepts of differentiation. (C1)
- c3- Identify rules of applications of differential calculus used engineering. (C1)
- c4- Explain basic concepts of Taylor expansion and Binomial expansion. (C1)
- c5- Apply basic concepts matrices and matrices algebra. (C1, C5, C9)
- c6- Identify solutions of systems of linear equations. (C1, C5)
- c7- Explain basic concepts of vectors, vector spaces and vector algebra. (C1)
- c8- Solve problems on limits, continuity and differentiate all continuous function. (C1, C9)
- c9- Use differential calculus to solve applied Engineering Models. (C1, C7, C9)
- c10- Apply infinite series, power series, Taylor and Meclaurin series to applications. (C1, C9)
- c11- Apply basic concepts of different methods to discuss solutions of linear systems. (C1, C5, C9)
- c12- Solve problems on vectors, vector spaces and vector algebra. (C1, C9)
- c13- Apply differential calculus in mechanics and electronics. (C1, C9)
- c14- Apply concepts of matrices and vectors to solve engineering problems. (C1, C9)
- c15- Write technical reports. (C7)
- c16- Communicate effectively in written form. (C8)
- c17- Expand students' awareness by urging them to search permanently in references and specialized websites. (C9, C7, C10)

This course contributes in the following program competencies: **C1, C5, C7, C8, C9 & C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Functions	3	4	—
2	➤ Differentiation	3	6	—
3,4	➤ Trigonometric and inverse trigonometric functions	4	6	—
5	➤ Exponential and logarithmic functions	2	4	—
6	➤ Hyperbolic and inverse hyperbolic functions	2	4	—
7	➤ Mid term	2	3	
8	➤ Taylor and binomial expansions	2	3	—
9,10,11	➤ Matrices with applications	6	6	—
12	➤ Vectors in the Euclidean space	2	3	—
13	➤ Real vector spaces	2	3	—
14,15	➤ Polar coordinates	2	3	—
Total hours		30	45	—

4. Course content/Course Competencies mapping matrix

Topic	Knowledge							Skills							Attitude		
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
Functions	1							1							1		1
Differentiation		1	1					1	1				1		1	1	1
Trigonometric and inverse trigonometric functions		1	1					1	1				1		1	1	1
Exponential and logarithmic functions		1	1					1	1				1		1	1	1
Hyperbolic and inverse hyperbolic functions		1	1					1	1				1		1	1	1
Taylor and binomial expansions				1						1					1	1	1
Matrices with applications					1	1					1			1	1	1	1
Vectors in the Euclidean space							1					1		1	1	1	1
Real vector spaces							1					1		1	1		1
Polar coordinates							1					1		1	1		1
Topics Covering Competences	1	4	4	1	1	1	3	5	4	1	1	3	4	4	10	7	10

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
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
c7	1	1	1	1	1	1		1
c8	1		1	1		1	1	1
c9	1				1	1		
c10	1	1		1	1	1		
c11	1		1	1	1	1	1	1
c12			1	1		1	1	1
c13	1	1						
c14	1	1						
c15		1		1	1			1
c16		1	1	1	1			1
c17	1				1			1
Σ	14	7	11	12	13	12	8	13

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

Osama Elgayar and Sabry Abd El-Aziz Algebra and Calculus, Lecture Notes, Modern Academy Press.

7-2 Required books:

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

Stewart, J. (2012) Calclus early transcendentals, 7ed, Canada: brooks/cole.

7-4 Recommended books:

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

7-4 Periodicals, Web sites, etc.

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

8- Facilities required for teaching and learning:

- Library.
- Internet.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Sabry Abd El-Aziz

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

PHYn001: Physics I

A- Affiliation

Relevant program:

Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Physics I

Code: PHYn001

Level: Zero

Credit Hours: 3

Lectures: 2

Tutorial/Exercise:1

Practical: 2

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

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

2 – Competencies

- c1- Explain the basic principles of rotational motion, application of rotational motion. (C1, C8)
- c2- Study laws of planetary motion derived from the law of gravity and deriving a general expression for gravitational potential energy. (C1, C3)
- c3 – Deduce mathematical relations describing the objects deform under load condition and defining of several elastic constants for different types of deformation. (C1, C2)
- c4 – Apply a theoretical model with certain simplifying assumptions to describe the wave motion and fluid motion. (C1, C2)
- c5 – Analyze, thermal phenomena through important terms, temperature, heat & internal energy. (C1)
- c6 - Use experimental facilities to explain the concept of internal energy and the process by which energy is transferred. (C2,C6, C8)
- c7- Apply the first law of thermodynamic on different systems and its applications (C1, C2)
- c8 -Learn the kinetic theory of gas, entropy, and engine efficiency. (C3, C4)
- c9 - Work in a team and involve in group discussion and seminars. (C2, C3, C7)
- c10 - 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. (C5, C10)
- c11 - Differentiate and compare the different types of heat transfer in different walls. (C8, C9)
- c12 - Search for information's in references and in internet. (C5, C9)
- c13 - Communicate and interact effectively with other people and in a small group. (C5, C8)
- c14 - Practice self-learning and communicate effectively orally and in written form. (C7, C8)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5,C6, C7, C8, C9 & C10.**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Rotational motion, angular displacement, velocity, acceleration	2		
2	• Relation between linear and angular quantities.	1	1	
3	• Applications on rotational motion	2	1	4
4	➤ Universal gravitational law	1	1	3
5	• Kepler's laws	2	1	
6	• Gravitational energy	1		
7	Mid term	2	1	1
8	• Escape speed and orbital energy	1	1	
9	➤ Elasticity: Linear, shear and Bulk deformation	3	2	4
10	➤ Characteristics of fluids and streamlines	1	1	4
11	• Fundamental laws of fluid	2	1	
12	• Applications on Bernoulli's equation	2	1	2
13	• Viscosity and Poiseuille's law	1	1	2
14	➤ Heat transfer by convection and conduction	2	1	2
14	➤ Work and heat in thermodynamic system	1		
14	• First law of thermodynamic	1		4
15	• Isothermal expansion of gases and Molar specific heat	2	1	
15	➤ Mathematical representation of transverse waves	1		
15	• The principle of superposition	1		
15	• Standing waves and Sound waves	1	1	4
Total Hours		30	15	30

4. Course content/Course Competencies mapping matrix:

Topic	Competencies													
	c1	c2	c3	c4	c5	c6	c7	C8	C9	c10	c11	c12	c13	c14
Rotational motion, angular displacement, velocity, acceleration	1	1		1					1			1		1
Relation between linear and angular quantities.	1	1		1					1			1		1
Applications on rotational motion	1	1		1					1			1		1
Universal gravitational law	1	1		1					1			1		1
Kepler's laws	1	1		1					1	1		1	1	1
Gravitational energy	1	1		1					1	1		1	1	1
Escape speed and orbital energy	1	1		1					1	1		1	1	1
Elasticity: Linear, shear and Bulk deformation			1						1	1		1	1	1
Characteristics of fluids and streamlines				1					1	1		1	1	1
Fundamental laws of fluid				1					1	1		1	1	1
Applications on Bernoulli's equation				1					1	1		1	1	1
Viscosity and Poiseuille's law				1					1	1		1	1	1

Heat transfer by convection and conduction					1	1	1	1	1	1	1	1	1	1
Work and heat in thermodynamic system					1	1	1	1	1	1	1	1	1	1
First law of thermodynamic					1	1	1	1	1	1	1	1	1	1
Isothermal expansion of gases and Molar specific heat					1	1	1	1	1	1	1	1	1	1
Mathematical representation of transverse waves				1					1	1		1	1	1
The principle of superposition				1					1	1		1	1	1
Standing waves and Sound waves									1	1		1	1	1
Topics Covering Competences	7	7	1	13	4	4	4	4	19	14	4	19	15	19

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods					Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Research and Reports	Written Exam	Quizes	Assignments
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
c5	1	1	1	1	1	1	1	1	1
c6	1	1	1	1	1	1	1	1	1
c7	1	1	1	1	1	1	1	1	1
c8	1	1	1	1	1	1	1	1	1
c9	1	1	1		1	1			
c10	1	1	1	1		1	1	1	1
c11	1	1	1	1	1	1	1	1	1
c12	1	1	1		1	1			
c13	1	1	1	1	1	1			
c14	1	1	1	1		1			
Σ	14	14	14	12	11	14	10	10	10

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	20
	Reports/Research		
	Assignments		
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

Physics I, PHYn001. Dr. El-Tawab Kamal, Dr. Abo el Yazeed B. Abo el Yazeed, Dr. Marwa Y. Shoeib and Dr. Nagat A. Elmahdy. Modern Academy Press.
Physics Lab (1) Note

7-2 Required books:

Serway (2003) Physics for Scientists & Engineering, USA: Sundress College Pub.
Griffith Thomas (2008) The Physics of Everyday Phenomena, USA: Mc-Graw hill.

7-5 Recommended books:

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

7-4 Periodicals, Web sites, etc.

<http://www.physicsclassroom.com/calcpad/circgrav/>

<http://physicsworld.com/>

<http://www.britannica.com/science/wave-motion>

<http://physics.info/>

<https://en.m.wikipedia.org>

<https://openstax.org>

<https://courses.lumenlearning.com>

<https://www.accessscience.com>

<https://physicaacademy.org>

<https://www.physics-academy.com>

<https://physicsshadows.blogspot.ae>

<https://m.youtube.com>

8- Facilities required for teaching and learning:

- Laboratories.
- Library.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Marwa Shoeib

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Chemistry

Code: CHEn001

Level: ZERO

Credit Hours: 3

Lectures: 2

Tutorial/Exercise:1

Practical: 2

Pre-requisite: non

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should be able to demonstrate the knowledge and understanding of the basic concepts 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 – Competencies

- c1- Identify and formulate key facts, concepts, principles and techniques of Gas and Liquid states of Matter. (C1,C2)
- c2- Identify theories relevant to Electrochemistry, solutions and thermo chemistry. (C1,C2,C3)
- c3- Apply some chemical industries in different fields such as eng. practices and regulatory farm works in chem. Eng. Industry.(C1,C3)
- c4- Identify technology Supporting water treatments and Desalination Techniques and Scientific principles of petroleum extraction and refining. (C1,C2,C4)
- c5- Identify basic principles for fuel classification and knowing its optimum characteristics, also identify advantage and disadvantage of them.(C1,C2)
- c6-Apply chem. Principles and analytical thinking to problems of Gases, Liquids and electrochemistry and determine its effective solutions. (C3,C4,C5)
- c7- Select and develop appropriate Some petrochemical Technologies. (C4)
- c8- Overlap different scientific subjects to reach a new scientific system with a better quality. (C5,C6,C7)
- c9- Select appropriate solutions for corrosion problems based on analytical thinking. (C5,C6,C7)
- c10- Apply knowledge of scientific equipment and instrumentation competently to determine known concentration and solve its problem.(C1,C2,C3,C6)
- c11- 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,C4,C5,C9)
- c12- Improve plan and execute project work including the preparation of descriptive and interpretative technical reports.(C8,C9,C10)
- c13- Apply experimental facilities to investigate the system performance.(pH and water hardness

degree).(C8,C9,C10)

c14- Prepare and present technical materials.(Soaps, detergents, and some polymeric samples).(C2,C3,C5)

c15- Observe, record and analyze data in lab. As well as in Field.(Lab Fresh water and undergrawnd water).(C3,C4)

c16- Use appropriate tools to measure system performance.(C3,C4)

c17- Improving own learning and performance, personal skills, working with others. (C9,C10)

c18- work both in written and oral form and search for information from references, journals and internet. (C8,C9,C10)

This course contributes in the following program competencies: **C1, C2, C3,C4, C5, C6, C7, C8, C9, C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Gas law and gas liquefaction.	4	2	-
2	Acid - base titration	-	-	4
2	Liquid state, Refrigeration & heat pump.	4	1	-
3	Electrochemistry	2	1	2
3	Acid - base titration	-	-	6
4	Metallic corrosion.	2	1	
5	Solution & Antifreezes	2	1	-
6	Thermo chemistry & solar heat, Rocket.	2	1	2
7	Assessment (M.T)	2	1	-
8	Water treatment and destitution	2	1	10
9	Polymer and Industry	2	1	-
10	Fuels and combustion	2	1	-
11	Chemistry and tech. of petroleum new trends in energy resource	2	1	-
12	Chemistry and tech. of petroleum new trends in energy resource	-	1	-
13	Industrial detergents chemistry such cement, lubricants, soap	2	1	2
14	Industrial detergents chemistry such cement, lubricants, soap	-	-	2
15	Revision and sheets	2	1	2
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	Competencies																	
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18
Gas law and gas liquefaction.	1					1											1	
Liquid state, Refrigeration & heat pump.						1											1	
Electrochemistry &Metallic corrosion.		1				1			1								1	
Solution & Antifreezes		1															1	
Thermo chemistry & solar heat, Rocket.		1																
Pollution																		1
Water treatment and destitution				1						1	1		1		1	1		
Polymer and Industry												1						

Fuels and combustion						1												
Chemistry and tech. of petroleum new trends in energy resource								1	1									1
Industrial detergents chemistry such cement, lubricants, soap			1						1		1			1			1	
Acid - base titration										1						1	1	
Topics Covering Competences	1	3	1	1	1	3	1	2	1	3	3	1	1	1	1	1	6	2

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods				Assessment Method				
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	
c4	1	1	1	1	1	1		1		1	1	1	1		
c5	1	1		1				1					1	1	
c6	1	1	1	1	1					1	1		1		
c7	1	1	1					1		1	1		1	1	
c8	1	1			1	1	1						1	1	
c9	1	1					1	1	1	1	1		1	1	
c10	1			1	1	1				1	1		1		
c11	1		1			1	1	1		1	1		1		
c12	1			1		1	1	1						1	
c13	1	1	1				1		1					1	
c14	1		1			1	1	1				1		1	
c15						1	1	1				1		1	
c16						1	1	1						1	
c17	1		1			1	1	1							
c18	1		1					1						1	
Σ	71	9	9	7	6	10	11	21	2	9	8	4	10	11	0

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	2 Quizzes (one each 4 weeks)	10
	Assignments	3 assignments per semester	5
	report	One report per semester	5
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

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

7-2 Required books

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

Recommended books: None

7-4 Periodicals, Web sites, etc.

- www.seciensedaily.com
- www.encyclopedia.com
- www.nasa.com
- www.science.com

8- Facilities required for teaching and learning:

- Chemistry lab.
- Computer, Data show.
- Computer programs.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr Shaaban Ragab Goda

Head of the Department:

Prof. Dr. Ashraf Taha

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification MNFn002: Engineering Graphics 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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Manufacturing Engineering and Production Technology Department.

Date of specifications approval:

August 2020

B - Basic Information

Title: Engineering Graphics

Code: MNFn002

Level: Freshman, first semester

Credit Hours: 2

Lectures: 1

Tutorial/Exercise: 3

Practical: -

Pre-requisite: MNFn001

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 isometric drawings & missing views and sectional views as well as steel constructions. The students will be able to apply the dimensioning principles on the drawings.

2 – Competencies:

- c1. Solve and communicate problems in orthographic views and isometric and oblique drawings (C2, C3, C7, C8, C9).
- c3. Consider the benefits of solving problems of developments and intersections and draw different problems in sectional views. (C3, C4, C8, C9)
- c5. Select the proper section for each component and draw dimensions for components from production point of view. (C1, C4, C5, C8)
- c7. Produce orthographic views from 3D models. (C6, C9, C10)
- c8. Read and understand orthographic drawing and prepare and interpret engineering drawing. (C1, C8, C14)
- c10. Read orthographic drawing with multi views and make necessary views using multi view and isometric. (C3, C5, C6, C9, C10)
- c12. Use the graphic language and communicate effectively with other discipline using the graphical language (C1, C5)
- c14. Expand their creative talents and to communicate their ideas in a meaningful manner. (C8, C9, C10)
- c15. Search for information and engage in life – long self learning discipline. (C8, C10)
- c16. Use graphically effectively. (C8, C9)
- c17. Refer to relevant literature. (C9, C10)
- c18. Search for information's in references and in internet and practice self-learning and continuous learning (C5, C8, C9, C10)

This course contributes to the following program competencies: **C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10**

3– Contents:

Weeks	Topics	Lecture hours	Tutorial hours	Practical hours
1	Revision of theory of orthographic projection: Projection of point; line and plane Projection of geometric solids.	1	3	0
2	Missing view drawing (of Vertical and Horizontal Surfaces).	1	3	0
3	Missing view drawing (of inclined Surfaces).	1	3	0
4	Missing view drawing (of cylindrical Surfaces).	1	3	0
5	Practices of multi view in all cases.	1	3	0
6	Pictorial drawing (isometric), Pictorial drawing (oblique).	1	3	0
7	Assessment (Mid-Term Exam)	1	1	0
8	Isometric drawing (of Vertical, Horizontal & inclined Surfaces and cylindrical Surfaces).	1	3	0
9	Sectional views	1	3	0
10	Sectional views: Basic types of sections: Full sections: longitudinal, cross – section.	1	3	0
11	Offset; Aligned sections; Half-section; Partial S.; Revolved & Auxiliary sections.	1	3	0
12	Steel constructions: Basic types of steel structures.	1	3	
13	Steel constructions: Projection of steel sectional.	1	3	0
14	Steel constructions: practices of constructions steel sectional.	1	3	0
15	Dimensioning – Arrangements of dimensions – Rules for dimensions of circles; radii ; angles ; plain holes.	1	3	0
Total hours		15	43	0

4 – Course content/Course Competencies mapping matrix:

Topics	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
1- Revision of theory of orthographic projection: Projection of point; line and plane Projection of geometric solids.	1			1								
2- Missing view drawing (of Vertical and Horizontal Surfaces).	1			1								
3- Missing view drawing (of inclined Surfaces).		1			1							
4- Missing view drawing (of cylindrical Surfaces).		1			1							
5- Practices of multi view in all cases.		1	1									
6- Pictorial drawing (isometric), Pictorial drawing (oblique).		1	1		1							
7- Isometric drawing (of Vertical, Horizontal & inclined Surfaces and cylindrical Surfaces).					1							
8- Sectional views			1									
9- Sectional views: Basic types of sections:				1	1							

Full sections: longitudinal, cross – section.														
10- Offset; Aligned sections; Half-section; Partial S.; Revolved & Auxiliary sections.				1	1									
11- Steel constructions: Basic types of steel structures.					1									
12- Steel constructions: Projection of steel sectional.			1	1										
13- Steel constructions: practices of constructions steel sectional.			1	1										
14- Dimensioning – Arrangements of dimensions – Rules for dimensions of circles; radii; angles; plain holes.	1													
Topics Covering Competencies	3	4	5	6	7	0	0	0	0	0	0	0	0	0

5 – Teaching, Learning, and Assessment Methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1	1		1	1		1	1		1		
c2	1		1	1	1	1	1	1	1	1	1	1	1		
c3	1			1	1	1			1	1	1	1	1	1	
c4	1	1	1	1	1		1	1	1	1	1		1	1	1
c5	1			1	1	1	1		1	1	1	1	1	1	
c6						1	1		1			1			
c7						1	1		1						
c8	1	1	1					1						1	1
c9	1	1	1					1							
c10		1	1					1							
c11	1	1	1					1						1	
c12	1										1		1	1	
Σ	9	5	6	5	5	5	6	7	6	5	6	4	6	6	2

6 – Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 Weeks)	20
	Tutorials	3 Assignments per semester	20
Written Exam		16 th Week	40
Total			100

7 – List of references:

7-1 Course notes:

- Engineering Graphics by Prof. Nabil Gadallah.

7-2 Required books

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

7-3 Recommended books

- None

7-3 Recommended Web Site

- None

8 – Facilities required for teaching and learning:

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

Course coordinator: Dr. Metwally Abd Elghaffar

Head of the Department: Dr. Metwally Abd Elghaffar

Date: August 2020

Modern Academy
for Engineering and Technology in Maadi



Course Specification
GENn042: English Language

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 Civil 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 Civil Engineering and Building Technology Department
Department offering the course:	Basic Sciences Department
Date of specifications approval:	August 2020

B - Basic information

Title: English Language	Code: GENn042	Level: ZERO	
Credit Hours: 2	Lectures: 2	Tutorial:	Practical:
	Pre-requisite: - None		

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 - Competencies

- c1- Identify the most frequent words, phrases and grammar rules in everyday conversation. (C5)
- c2- Communicate effectively, even at the very beginning levels. (C8)
- c3- Differentiate between tenses in conversation. (C10)
- c4- Enhance class interaction in terms of speaking, reading, listening and writing. (C10)
- c5- Personalize the learning experience by offering students interesting topics relevant to their interests and experiences. (C10)
- c6- Employ tasks which encourage students to take an active role in learning and using new vocabulary. (C9)
- c 7- Write paragraphs and peer edit them using error detection.(C8)
- c 8- Interact with each other and with the professor. (C8)
- c9- Work in a team and involve in group discussion. (C8)
- c10- Communicate effectively and present data and results orally and in written form. (C8, C10)
- c11- Search for information in references and in internet. (C10)
- c12- Practice self-learning. (C10)

This course contributes in the following program competencies: **C5, C8, C9, C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Computer Hackers	2		
2	At the Doctor's Reviewing tenses Reading	2		
3	At the Doctor's (to be continued) Grammar: perfect tenses& prefixes	2		
4	Global Warming Reading Speaking : English communication skills Suffixes & adj.&adv.	2		
5	Computer Addiction Reading: 53-55 Seaking: discussing the topic Grammar: adjectives	2		
6	Earthquake Reading: 59-61 Grammar: Suffixes	2		
7	MID TEARM	2		
8	Words and their Stories Reading Grammar: wh-questions and negatives	2		
9	Revision 7 th week Exam	2		
10	Describing People & Things Reading : Grammar:adj.& adv	2		
11	Describing People & Things (to be contiued) Reading : Grammar : relative clauses	2		
12	Qualities and Flaws Speak: dicussing qualities and flaws of each one (pair work Grammar: Possession Pronouns+ Adjectives	2		
13	Qualities and Flaws (to be continued) List. & Speak:dicussing the topic	2		
14	People Idioms Grammar:gerund "& to infinitive & adjectives with prepositions	2		
15	English proverbs Grammar: problem verbs	2		
Total hours		30	-	-

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Computer Hackers	1	1	1	1	1	1	1	1	1	1	1	1
At the Doctor's Reviewing tenses Reading	1	1	1	1	1	1	1		1	1		1
Global Warming Reading Speaking : English communication skills Suffixes & adj.&adv.	1	1	1	1	1	1	1		1	1	1	1
Computer Addiction Reading: 53-55 Seaking: discussing the topic Grammar: adjectives	1	1	1		1	1	1		1	1		1
Earthquake Reading: 59-61 Grammar: Suffixes	1	1	1	1	1		1		1	1	1	
Words and their Stories Reading Grammar: wh-questions and negatives	1	1	1	1	1	1	1		1	1		1
Revision 7 th week Exam						1	1			2		1
Describing People & Things Reading : Grammar:adj. & adv	1	1	1	1	1		1	1		1	1	1
Describing People & Things (to be contiued) Reading : Grammar : relative clauses	1	1	1		1	1	1	1		1	1	
Qualities and Flaws Speak: dicussing qualities and flaws of each one (pair work Grammar: Possession Pronouns+ Adjectives	1	1	1		1	1		1		1		1
Qualities and Flaws (to be continued) List. & Speak:dicussing the topic	1	1	1	1	1	1		1		1	1	
People Idioms Grammar:gerund "& to infinitive & adjectives with prepositions Revision and sheets	1	1	1	1	1	1		1	1	1	1	1
Topics Covering Competences	12	12	12	9	12	10	10	6	9	12	8	8

5- Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1		1				1			1			1		1
c2	1							1							
c3	1						1			1			1	1	1
c4	1		1					1							
c5	1							1						1	1
c6	1														
c7	1		1					1		1		1	1	1	1
c8	1						1						1	1	1
c9	1						1	1					1		
c10	1		1										1	1	
c11	1		1				1	1							
c12	1						1	1					1		
Σ	12		5				6	7		3			3	7	6

6- Assessment Timing and Grading:

Assesment Method	Timing	Grade (Degrees)
Assignments and Reports	Bi-Weekly	20
Two Quizzes	5 th and 10 th	20
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes:

The English Language Book by Dr Neveen Samir , 2015

7-2 Required books

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

7-3 Recommended books: Non

7-4 Periodicals, Web sites, etc.:

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

8- Facilities required for teaching and learning:

Library

High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Neveen Samir

Head of the Department:

Prof. Dr. Ashraf Taha

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification MECn002: 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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Mechanics-2

Code: MECn002

Level: Zero

Credit Hours: 2

Lectures: 1

Tutorial/Exercise:3

Practical: ---

Pre-requisite: MECn001

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge, skills, and attitudes) related to the basic concepts of 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 – Competencies

- c1- Identify basic of dynamics like velocity, acceleration, total distance, average velocity and average speed. (C1, C5).
- c2- Identify of differentiation and integration (C1)
- c3- Classify the particle's motion in straight line and in curved path and it's applications (C1, C5)
- c4- Understand the dynamics system and the effect of forces on the system in different coordinates (C1).
- c5- Classify of two methods of kinetics, namely, the method of work and energy and method of impulse and momentum. (C1, C5, C9)
- c6- 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 (C1, C5, C9)
- c7- Classify and compare the different between the average velocity and average speed (C1, C5, C9).
- c8- Solve the equation of motion to get velocity, acceleration and total distance traveled at any time. (C1, C5, C9)
- c9- Calculate the time of flight of projectile to get a target. (C1, C5, C9).
- c10- Solve the equation of motion graphically. (C1, C5, C9)
- c11- Work in a team to solve problem as a search. (C7, C8)
- c12- Search for information in references and in internet (C7, C9, C10).

This course contributes in the following program competencies: **C1, C5, C7, C8, C9 & C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Rectilinear Motion of particles.	1	3	—
2	➤ Determination of the motion of a particle.	1	3	—
3	➤ Graphical Solution of Rectilinear Motion.	1	1	—
4	➤ Curvilinear Motion of particle, Free Flight Motion.	2	3	—
5	➤ Normal and Tangention.	1	3	—
6	➤ Plane Curvilinear Motion.	1	3	—
7	➤ Mid tearm	1	1	
8	➤ Polar Coordinates.	1	1	—
9,10	➤ Kinetics of Particles, Force and acceleration.	2	3	—
11,12	➤ Kinetics of Particles Energy and Momentum Methods	2	3	—
13	➤ Motion under a conservative central force.	1	3	—
14,15	➤ Principle of Impulse and Momentum for particle.	1	3	—
Total hours		15	30	—

4. Course content/Course Competencies mapping matrix:

Topic	Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Rectilinear Motion of particles.	1											1
Determination of the motion of a particle.	1	1	1								1	1
Graphical Solution of Rectilinear Motion.	1		1								1	1
Curvilinear Motion of particle, Free Flight Motion.		1									1	1
Normal and Tangention.		1	1								1	1
Plane Curvilinear Motion.				1							1	1
Polar Coordinates.			1	1							1	1
Kinetics of Particles, Force and acceleration.					1	1	1				1	1
Kinetics of Particles Energy and Momentum Methods				1	1	1	1				1	1
Motion under a conservative central force.				1	1		1	1		1	1	1
Principle of Impulse and Momentum for particle.					1			1	1	1	1	1
Topics Covering Competences	3	3	4	4	4	2	3	2	1	2	10	11

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method			
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Term papers	Assignments
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	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
c7	1	1	1	1		1	1	1	1
c8	1	1	1	1		1	1	1	1
c9	1		1			1	1	1	1
c10	1		1	1				1	1
c11				1	1			1	
c12					1			1	
Σ	10	5	10	8	5	9	9	12	10

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

Moamen Wafaie, Engineering Mechanics (Dynamics), Lecture Notes, Modern Academy Press.

7-2 Required books:

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

R.C. Hibbeler Engineering mechanics, Dynamics.

7-6 Recommended books: None

7-4 Periodicals, Web sites, etc.

Basic of mechanical engineering, engineering mechanics statics and dynamics, statics and dynamics hibbeler 12th edition and there is teams link apploaded by videos concerning the course.

8- Facilities required for teaching and learning:

- Library. - Internet. - High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Shima Lotfy

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

MTHn002: 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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Mathematics-2(Integration and Analytic Geometry)

Code: MTHn002

Level: Zero

Credit Hours: 3

Lectures: 2

Tutorial/Exercise:3

Practical: ---

Pre-requisite: MTHn001

C - Professional information

1 – Course Learning Objectives:

By the end of this course:

Students will master basic calculus concepts, including integration techniques, convergence of integrals and infinite series, and analytic geometry with their applications.

Knowledge of the above concepts will be exhibited algebraically and geometrically.

Students will be able to use the above concepts to solve physics and geometry problems.

Students will understand the usage of mathematical notation in relation to the above topics.

2 – Competencies

c1. Identify definition of anti-derivative, indefinite integral, definite integrals. (C1, C5)

c2. Identify methods of integration (integration by parts, substitution). (C1, C5)

c3. Explain Integration rules of trigonometric functions, integration of rational functions, improper integrals. (C1, C5)

c4. Identify basic concepts of convergence of infinite sequences and series. (C1, C5)

c5. Develop equations of lines, planes, and conic sections. (C1, C5)

c6. Investigate the geometric interpretation of the integration. (C1, C5, C9)

c7. Develop techniques for using basic integration formulas to obtain indefinite integrals of complicated functions. (C1, C5, C9)

c8. 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. (C1, C5, C9)

c9. Develop several tests to determine whether a series is convergent or divergent without explicitly finding its sum. (C1, C5, C9)

c10. Estimate of the sum of the convergent series and the error using various methods. (C1, C2)

c11. Derive the equation and main geometric properties of lines, planes and conic sections. (C1, C5, C9)

c12. Explain the use of integration to estimate the area between curves, the volume of solids with known cross sections, and the arc length. (C1, C2, C5, C9)

c13. Encourage teamwork and participate in group discussions and seminars (C7).

c14. Communicate effectively and present data and results orally and in written form (C8).

c15. Expand students' awareness by urging them to search permanently in references and specialized websites. (C9, C7, C10).

This course contributes in the following program competencies: **C1, C2, C5, C7, C8, C9 & C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Anti-derivative, indefinite integral	2	2	—
2	➤ Definite integrals and the fundamental theorem of calculus	2	3	—
3,4	➤ Methods of integration (integration by parts, substitution)	4	6	—
5	➤ Integration of trigonometric functions	2	4	—
6	➤ Trigonometric Substitutions	2	3	—
7	➤ Mid term	2	2	—
8	➤ Integration of rational functions	2	4	—
9	➤ Miscellaneous Substitutions, improper integrals	2	4	—
10,11	➤ Application of definite integral (area, volume, arc length, surface area)	3	4	—
12,13	➤ Sequences, series	4	6	—
14	➤ Equations of lines, planes and circles	3	4	—
15	➤ Conic sections (parabola, ellipse, hyperbola)	2	3	—
Total hours		30	45	—

4. Course content/Course Competencies mapping matrix

Topic	Competencies														
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15
Anti-derivative, indefinite integral	1												1		1
Definite integrals and the fundamental theorem of calculus	1					1						1	1	1	1
Methods of integration (integration by parts, substitution)		1				1	1					1	1	1	1
Integration of trigonometric functions			1			1	1					1	1	1	1
Trigonometric Substitutions			1			1	1					1	1	1	1
Integration of rational functions			1			1	1					1	1	1	1
Miscellaneous Substitutions, improper integrals			1			1						1	1	1	1

Application of definite integral(area, volume, arc length, surface area)				1				1	1				1	1	1	1											
Sequences, series				1					1	1				1		1											
Equations of lines, planes and circles					1							1		1		1											
Conic sections (parabola, ellipse, hyperbola)					1							1	1	1	1	1											
Topics Covering Competences													2	1	4	2	2	6	5	1	1	1	2	8	11	8	11

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
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
c5	1		1	1	1	1	1	1
c6	1		1	1		1	1	1
c7	1		1	1		1	1	1
c8	1	1	1	1	1	1		1
c9	1		1	1		1		1
c10	1		1	1		1		1
c11	1	1	1	1	1	1		1
c12	1	1	1	1	1	1		1
c13		1		1	1			
c14		1			1			
c15		1			1			
Σ	12	8	12	12	9	12	7	12

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

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

7-2 Required books:

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

E. W. Swokoski, Algebra & trigonometry with analytic geometry, 10ed, brooks cole,U.S.A.,2002.

7-7 Recommended books:

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

7-4 Periodicals, Web sites, etc.

www.sosmath.com .

8- Facilities required for teaching and learning:

- Library.
- Data show
- Required Computer programs
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Sabry Abd El-Aziz

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Physics 2

Code: PHYn002

Level: Zero, Spring

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 – Competencies

- c1- Explain the fundamental and basic law of applications in electricity, magnetism, and electromagnetism. (C1)
- c2- Study Gauss's law in electricity for different type of charged bodies. (C1)
- c3 - Deduce mathematical relations describing laws of electric capacitors and effect of dielectric. (C2)
- c4 - Understand direct current, resistance and solution of simple electric circuits and Kirchhoff's laws. (C1, C2)
- c5 - Analogy between magnetic field and electric field., and application of Ampere's law, Gauss's law in magnetism. (C1)
- c6 - Use experimental facilities to explain the Magnetic properties of matter. (C4)
- c7- Explain fundamental theories of Electro-magnetic waves and main physical phenomena of physical optics (interference, diffraction, and polarization) (C1, C2)
- c8 - Investigate electric force and electric field (using Gauss's law) and select the proper manner to solve problem. (C3, C4)
- c9 - Work in a team and involve in group discussion and seminars. (C2, C3, C7)
- c10 - Study of capacitors' and dielectric effect, uses of capacitors, and use Kirchhoff's laws to solve simple electric circuits. (C5, C10)
- c11 - 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. (C8, C9)
- c12 - Search for information's in references and in internet. (C5, C9)
- c13 - Communicate and interact effectively with other people and in a small group. (C5, C8)
- c14 - Practice self-learning and communicate effectively orally and in written form. (C7, C8)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C7, C8, C9 & C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1,2	➤ Charge and Matter, The Electric Field, Gauss' law	2	1	2
3	➤ Gauss's law applications	2	1	2
4	➤ Electric Potential	2		2
5	➤ Capacitors and Dielectric	2	1	2
6	➤ Capacitors and Dielectric	2	1	2
7	➤ Mid term			
8,9	➤ The Magnetic Field, Ampere's Law	2	1	2
10,11	➤ Ampere's law, Inductance	2	1	2
12	➤ Magnetic Properties of matter	2	1	2
12	➤ Magnetic Properties of matter, Electromagnetic Waves	2	1	2
13	➤ Electromagnetic Waves	2	1	2
13	➤ Electromagnetic Waves, Physical Optics, Polarization of light	2	1	2
14	➤ Polarization of light	2	1	2
14	➤ Interference of light	2	1	2
15	➤ Interference of light, Diffraction of light	2	1	1
15	➤ Diffraction of light, Some applications	2	1	1
Total Hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	C8	C9	c10	c11	c12	c13	c14
Charge and Matter, The Electric Field, Gauss' law	1	1	1	1	1		1	1	1		1	1		1
Gauss's law, Electric Potential	1	1	1	1	1		1	1	1		1	1		1
Gauss's law applications	1	1	1	1	1		1	1	1		1	1		1
Capacitors and Dielectric	1	1	1	1	1		1		1	1	1	1		1
Capacitors and Dielectric	1	1	1	1	1		1		1	1	1	1	1	1
The Magnetic Field, Ampere's Law	1		1	1	1	1	1		1	1	1	1	1	1
Ampere's law, Inductance	1		1	1	1	1	1		1	1	1	1	1	1
Magnetic Properties of matter	1			1	1	1	1		1	1	1	1	1	1
Magnetic Properties of matter, Electromagnetic Waves	1			1	1	1	1		1	1	1	1	1	1
Electromagnetic Waves	1				1	1	1		1	1	1	1	1	1
Electromagnetic Waves, Physical Optics, Polarization of light	1				1	1	1		1		1	1	1	1
Polarization of light					1	1	1		1		1	1	1	1
Interference of light						1	1	1	1		1	1	1	1
Interference of light, Diffraction of light						1	1	1	1		1	1	1	1
Diffraction of light, Some applications						1	1	1	1		1	1	1	1
Topics Covering Competences	11	5	7	9	12	10	15	6	15	7	15	15	11	15

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods					Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Laboratory & Experiments	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
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
c5	1	1	1	1	1	1	1	1	1
c6	1	1	1	1	1	1	1	1	1
c7	1	1	1	1	1	1	1	1	1
c8	1	1	1	1	1	1	1	1	1
c9		1	1	1		1			
c10	1	1	1	1	1	1	1	1	1
c11	1	1	1	1	1	1	1	1	1
c12		1	1	1		1			
c13	1	1	1	1	1	1			
c14	1	1	1	1	1	1			
Σ	12	14	14	14	12	14	10	10	10

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Mid-Term Exam	7 th Week	20
Semester Work	Quizzes	20
	Reports/Research	
	Assignments	
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-2 Course notes:

PHYn002, Physics II.
Physics Lab (2) Note

7-2 Required books:

M. El- Tawab Kamal and Abo- Elyzeed B. Abo- Elyzeed, Marwa Shoeb, Nagat Elmahdy. Electricity, Magnetism and Optics Physics
Serway (2003) Physics for Scientists & Engineering, USA: Sundress College Pub.
Griffith Thomas (2008) The Physics of Everyday Phenomena, USA: Mc-Graw hill.

7-8 Recommended books:

David Halliday, Robert Resnick, Jearl Walker, Fundamentals of Physics, John Wiley, New York, 1993.

Raymond A. Serway, Physics for Scientists and Engineers with Modern Physics, 3rd ed. Wiley, New York, 1990.

7-4 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/>

8- Facilities required for teaching and learning:

- Laboratories.
- Library.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Nagat A. Elmahdy

Head of the Department:

Associate Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

MNFn003: Principles of Production Engineering

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:	August 2020

B - Basic Information

Title: Principles of Production Engineering	Code: MNFn003	Year/level: Level zero
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: - Practical: 3
	Pre-requisite: None	

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the student should have gained the planned competencies (based on the knowledge, skills, and personal attitude) related to the production system and different methods of production by cutting and non-cutting processes theoretically and practically.

2 – Competencies:

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

- c1- Basic production methods related to casting, metal forming processes, welding, and metal cutting (C1)
- c2- Design pattern, allowances in casting & solidification (C2), (C3).
- c3- Fundamental of centrifugal casting process (C1)
- c4- Classification of welding process (C1, C4).
- c5- Basic methods of hot and cold forming (C1, C4).
- c6- Applications of metal cutting processes (C1)
- c7- Select the proper manufacturing process for a specific product (C3, C4)
- c8- Design the pattern for sand casting (C3, C4)
- c9- Choose the suitable welding method or different joining (C2, C3, C4)
- c10- Use the principle of production engineering in producing good quality cheap product (C4)
- c11- Solve some simple production problems related to method of production selection (C3)
- c12- Use the studied manufacturing methods in producing prototypes during practical hours (C7).
- c13- Collect, record and submitting data about production engineering (C10).
- c14- Work in a team and involve in group discussion (C6, C7).
- c15- Communicate effectively and present data and results orally (C8).
- c16- Search for information's in references and in internet (C5).
- c17- Practice self-learning (C10).

This course contributes to the following program competencies: **C1, C2, C3, C4, C5, C6, C7, C8 & C10**

3 – Contents:

Weeks	Topics	Lecture hours	Tutorial hours	Practical hours
1-3	Role of production engineering, production system objective, types of industries, classification of manufacturing processes.	4		
4-6	Sand casting, melting of metal & furnaces. Solidification, pattern allowances, sand molding & gating system. Die casting, centrifugal & investment casting.	6		8
7	Assessment (Mid-Term Exam)	2		
8-10	Types of welding, oxy- acetylene welding, electric- arc welding, submerged arc welding, MIG, TIG, resistance welding, soldering & brazing	6		8
11, 12	Hot & cold forming, rolling, extrusion, wire drawing & sheet metal forming	6		9
13-15	Metal cutting processes (Turning, milling, shaping, grinding and drilling)	6		20
Total hours		30		45

4 – Course content/Course Competencies mapping matrix:

Topics	Course Competencies																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
1- Role of production engineering, production system objective, types of industries, classification of manufacturing processes ..	1	1	1					1									
2- Sand casting, melting of metal & furnaces. Solidification , pattern allowances, sand molding & gating	1	1	1					1		1	1	1	1	1		1	1

system. Die casting, centrifugal & investment casting.																	
3- Types of welding, oxy-acetylene welding, electric- arc welding, submerged arc welding, MIG, TIG, resistance welding, soldering & brazing.				1				1	1	1	1	1	1			1	1
4- Hot & cold forming, rolling, extrusion, wire drawing & sheet metal forming					1			1	1	1	1	1	1				
5- Metal cutting processes (Turning, milling, shaping, grinding, and drilling)	1						1	1		1	1	1	1	1		1	1
6- Practical training in different production method (workshops during the whole semesters)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Topics covering Competencies	4	3	3	2	2	2	2	4	4	5	5	5	5	4	1	4	4

5 – Teaching, Learning, and Assessment Methods:

Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory Experiment	Research, Reports & Assignments	Self-learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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	
c5	1	1	1			1			1	1		1	1	1	
c6	1	1	1			1			1	1		1	1	1	
c7	1	1	1			1				1		1	1	1	
c8	1	1	1			1			1	1		1	1	1	
c9	1	1	1			1				1		1	1	1	
c10	1	1	1			1				1			1	1	
c11	1		1			1				1		1			
c12	1	1				1				1		1			
c13	1	1				1		1		1				1	
c14		1	1			1									
c15			1			1						1			
c16														1	
c17								1				1			
Σ	13	13	13	0	0	15	0	2	6	13	0	12	11	12	0

6 – 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
Practical Exam	15 th Week	20
Written Exam	16 th Week	40
Total		100

7 – List of references:

7-1 Course notes:

- Lecture notes & workshop training notes

7-2 Required books:

- Serope Kalpakjian, " Manufacturing Engineering and technology", prentice hall, 2010

7-3 Recommended books:

- None

7-4 Periodicals, Web sites, etc.:

- None

8 – Facilities required for teaching and learning:

- Lecture room, and workshops

Course coordinator:

Dr. Maher Khalifa

Head of the Department:

Dr. Metwally Abd ElghaffSar

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn060: Summer Training-1

A- Affiliation

Relevant program:	Electronic Engineering & Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Electronic Engineering & Communication Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Electronic Engineering & Communication Technology Department.
Date of specifications approval:	August, 2020

B - Basic information

Title: Summer Training-1	Code: ELCn060	Year/level: Senior 1, First Summer
Credit Hours: 0	Lectures: 2	Tutorial: none Practical: 5 Days
	Pre-requisite: none	

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to the parts of the training which are:

- The basic elements, units of the electrical circuits and the student will be able to connect and test different electrical circuits on the bread board.
- The 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.
- The Basics of electrical and electronics elements (Diode, Capacitor, resistance, Bipolar Junction Transistor...).
- Implementing the modern electronic application circuit in a Bread board and Printed circuit board.

2 – Competencies

- c1. Understand the basic electronic and electrical elements (resistor, capacitor, inductor, BJT, MosFET). (C3,C8)
- c2. Introduce basic electrical concept (Ohm's Law, Kirchhoff's circuit law, Series and parallel resistor circuit, voltage and current divider). (C1,C3).
- c3. Understand the characteristic of basic electrical & electronic elements. (C1,C3).
- c4. Implement circuit which introduce basic electrical concept (Ohm's Law, Kirchhoff's circuit law, Series and parallel resistor circuit, voltage and current divider). (C3, C4)
- c5. Understanding the operation of digital logic gates (AND, OR, NOR, NAND, XOR). (C1, C3)
- c6. Verify the truth tables of digital logic gates (AND, OR, NOR, NAND,XOR). (C3,C4)
- c7. Understand the different electronic circuit using the basic electronic and electrical element (C14,C16)
- c8. Implement the different electronic circuit using the basic electronic and electrical element. (555 Timer circuit, 10 minute alarm, power alarm). (C14 C16,)
- c9. Search for information and engage in life-long self-learning discipline (C5,C10)
- c10.. Collaborate effectively within multidisciplinary team (C5,C10)
- c11. Practice self-learning and communicate effectively orally and in written form(C10,C15)

This course contributes the program competencies: **C1, C3, C4, C5, C8, C10, C14, C15 & C16.**

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical Day
1- Basic electronic and electrical elements.	-	-	1
2- Introduce basic electrical concept.	-	-	1
3- Operation of digital logic gates.	-	-	1
4- Implement the different electronic circuit.	-	-	2
Total Days	-	-	5

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies										
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11
1- Basic electronic and electrical elements.	1	1	1	1							
2- Introduce basic electrical concept.	1	1	1	1			1	1			
3- Operation of digital logic gates.					1	1		1		1	
4- Implement the different electronic circuit.			1	1	1	1	1	1	1	1	1
Topics Covering Competencies	2	2	3	3	2	2	2	3	1	2	1

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1					1									
c2		1													
c3	1						1								
c4			1			1									
c5		1	1					1							
c6					1				1						
c7	1				1	1	1	1							
c8			1				1		1						
c9		1					1								
c10	1				1										
c11		1													
Σ	4	4	3	-	2	3	2	3	2						

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Practical Exam	5 days	Pass or Fail
Total		Pass Or Fail

7- List of references:

7-1 Course notes:

Summer Training Level 0 “*Theoretical part*”

7-2 Required books

1-Boylestad, “Introductory circuit analysis” , prentice Hall, 2003.

7-9 Recommended books: None

William. Hayat “ Engineering Circuit analysis”, **Wiley, 2009.**

7-10 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 Elshahat

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn111: Electrical Circuit Analysis-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:	August, 2020

B - Basic Information

Title: Electrical Circuit Analysis-1	Code: ELCn111	Level: 1 st Spring	
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:1	Practical: 2
	Pre-requisite: MTHn002, ELCn060		

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 – Competencies

- c1- Understand Basic concepts, ideas and laws of electrical circuit analysis. (C1)
- c2- Implement Voltage, current, and power calculation for simple resistive circuits. (C1, C2)
- c3- Analyze Applications of Ohm's and Kirchhoff's Laws. (C1, C2)
- c4- Realize Series, parallel and delta-star connections principles. (C1, C14)
- c5- Discriminate Different techniques of circuit analysis. (C1, C14)
- c6- Realize Operational-amplifier characteristics and applications. (C1, C14)
- c7- Understand Characteristics of a sinusoidal current and voltage. (C2, C6)
- c8- Understand Basic concepts of RL and RC circuits. (C6, C14)
- c9- Apply the Ohm's and K's laws. (C2, C14, C18)
- c10-Apply the powerful techniques of circuit analysis. (C2, C9, C14, C18)
- c11-Use the operational-amplifier in different applications. (C2, C6, C14, C18)
- c12-Apply Thevenin's theorem. (C2, C9, C14, C18)
- c13-Use different types of basic hand tools and different types of switches to construct a circuit. (C14, C16)
- c14-Identify all types of electrical lamps and primary cells (Batteries) that are used in numerous circuits applications. (C16, C18)
- c15-Read and determine the value of the resistance and capacitance using color code. (C4, C14)
- c16-Use different symbols of circuits. (C16, C18)
- c17-Use and read the measured values shown by oscilloscopes, and laws principles. (C2, C6, C14)
- c18-Construct simple circuits applying the learned laws and principles given in lectures. (C9, C18)
- c19-Communicate effectively through reports and e-mails. (C8, C9)
- c20-Manage tasks, time, and resources effectively. (C8, C9)
- c21-Search for information and engage in life-long self-learning discipline. (C4, C5)

This course contributes in the following program competencies: **C1, C2, C4, C5, C7, C6, C8, C9, C14, C16 & C18**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Units Dimensions and Standards.	2	1	2
2	Circuit Variables and elements.	2	1	2
3	Simple Resistive Circuit.	3	2	3
4	Node Voltage Method.	2	1	2
5	Mesh Current method	2	1	2
6	Source Transformation and Supper Position Principle.	3	1	4
7	Assessment (Mid- Term)	-	-	-
8	Thevenin's Theorem.	3	2	3
9	Operational Amplifiers.	2	1	2
10		2	1	2
11	Inductance, Capacitance and Mutual Impedances	2	1	2
12	Response of RL and RLC Circuits.	2	1	2
13		2	1	2
14	Revision	1		
15		1	1	
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Compteneces																				
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18	c19	c20	c21
Units Dimensions and Standards.	1	1	1																		
Circuit Variables and elements.	1	1					1			1						1				1	1
Simple Resistive Circuit.			1	1		1		1		1				1	1				1		
Node Voltage Method.			1	1	1	1		1	1	1		1			1	1					
Mesh Current method		1			1			1	1	1		1	1		1		1		1		
Source Transformation and Supper Position Principle.		1						1	1			1	1		1	1					1
Thevenin's Theorem.		1	1									1									
Operational Amplifiers.								1	1		1			1							
Inductance, Capacitance and Mutual Impedances.						1		1		1		1	1			1					
Response of RL and RLC Circuits.						1		1	1	1			1	1		1				1	1
Topics Covering Competencies	2	5	3	2	2	4	1	7	5	5	2	5	4	3	4	5	1	1	1	2	3

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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		
c4	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		
c8	1		1	1		1	1			1	1	1	1		1
c9		1	1				1	1	1	1	1	1	1		1
c10	1			1	1							1	1		
c11						1		1				1	1		
c12	1					1	1	1							1
c13		1	1				1		1					1	1
c14					1		1							1	
c15						1		1				1		1	
c16						1						1			
c17		1		1			1								1
c18								1						1	
c19															
c20															
c21			1					1						1	
Σ	9	5	7	8	3	8	6	9	2	9	9	3	9	6	6

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Electrical Circuit Analysis-1 “Theoretical part”.
- Electrical Circuit Analysis-1 “Practical part”.

7-2 Required books

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

7-3 Recommended books:

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

7-4 Periodicals, Web sites, etc.

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

8- 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: Dr. Haytham Gamal.
Dr. Mohamed Ismail
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification CMPn111: Logic Circuits Design-1.

A- Affiliation

Relevant program:

Computer Engineering and Information Technology BSc Program
Electronic Engineering and Communication Technology BSc Program

Department offering the program:

Computer Engineering and Information Technology Department
Electronic Engineering and Communication Technology Department

Department offering the course:

Computer Engineering and Information Technology Department

Date of specifications approval:

August, 2020

B - Basic Information

Title: Logic Circuits Design-1

Code: CMPn111

Level: 1st Fall

Credit Hours: 4

Pre-requisite: MTHn001

Credit Hours: 4

Contact Hours:

Lectures: 3

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 - Competencies

- c1. Construct the laws of Boolean algebra to simplify a complicated logic expression. (C1).
- c2. Construct the truth table for a special given problem. (C1).
- c3. Expresses the logic function in the S.O.P and P.O.S algebraic forms and karnaugh map representation. (C2,C3).
- c4 Minimize of logic functions using K.M and Quine – Mc – Clusky's tabular method and realization using NAND and NOR gates only. (C13).
- c5. Construct the Combinational modules used in digital systems like adders, de-multiplexers, multiplexers, decoder, encoder, parity checker and comparator circuits. (C12,C13,C14).
- c6. Explain the Representation of simple sequential circuits using state diagram and state table (C13,C14,C17).
- c7. Explain the Sequential circuit elementary Flip-Flop circuits (C15).
- c8. Deduce overcoming racing in synchronous sequential circuits using M.S or edge-triggered Flip-Flops (C14)
- c9. Explain Sequential logic modules like registers, shift registers, and counters (C16)
- c10. Explain the Memory modules like combinational ROM and RAM sequential modules (C16,C17)
- c11. Deduce a logic function for solving a given simple problem (C17).
- c12. Achieve a logic model which introduces a solution of a high-scale problem using combinational modules (C12)
- c13. Analyze the realization approaches using gate and modular designs and determine the measures for selection of any of them (C12,C13,C14).
- c14. Investigate the benefits of using a special Flip-Flop type for realizing a sequential circuit or using the asynchronous or the synchronous approach (C14).
- c15. Suggest a solution for an allocated sequential problem and report the merits of this solution (either higher speed of lower cost) (C3).
- c16. Construct the logic circuit using available logic gates satisfying minimum cost (C3).
- c17. Use the practical lab. Knowledge to construct the layout for a solution using modular design (C15,C18).
- c18. Investigate the output performance for input sequence (C14).
- c19. Design a binary counter counting in an arbitrary input random sequence using any type of Flip-Flops (C3, C12,C13).
- c20. Design the associated circuits for fault detection in counter operation and presetting to a given initial state (C3,C12,C15).
- c21. Use internet, references and journals for searching information (C5, C9,C10).
- c22. Write a technical report for a given task and prepare its presentation (C5, C10).
- c23. Join teams (C7, C8,C10).

This course contributes in the following program competencies: **C1, C2, C3, C5, C7, C8, C9, C10, C12, C13, C14 , C16, C17 & C18**

3 – Contents

SN	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Introduction •Basic Definitions. Laws of Boolean algebra.	3	1	1
2	➤ Logic Functions Representation & Realization Methods of representation of logic functions truth table, S.O.P and P.O.S).	2	1	1
3	•Realization of logic functions using AND-OR_NOT, NAND only and NOR only gate systems. Matching logic functions with gate systems.	1	2	1
4	➤ Logic function minimization •Using basic laws of Boolean. •Using karnaugh map minization. •Using Quine-Mc Clusky's Methods. Minimization of multiple-output Logic Functions.	6	-	4
5	➤ Combinational logic modules Half and full adders, Parallel adder connection, look ahead carry.	2	2	1
6	➤ Decoders and de-multiplexers ➤ Encoders ➤ Data selectors (multiplexers) •Parity checkers. •Read only memories. Binary comparators.	8	7	1
7	Assessment (Mid-Term)	-	-	-
8	➤ Sequential logic circuit elements State diagram and state table representation of sequential circuits.	2	-	-
9	➤ Asynchronous and synchronous sequential elements •S-R Flip-Flop, and J-K Flip Flop. •D Flip-Flop, and T Flip Flop. •Racing in sequential circuits. Master-slave and Edge-triggered Flip-Flops.	5	6	1
10	•Racing in sequential circuits. Master-slave and Edge-triggered Flip-Flops.	2	2	1
11	➤ Sequential logic circuit modules Introduction.	1	-	-
12	Registers and shift registers	3	2	1
13	Asynchronous and synchronous counters	4	3	2
14	Counter using shift-registers (Johnson and ring counters)	3	1	-
15	Random access memories (basic cell, addressing and read-write operations)	3	3	1
Total hours		45	30	15

4. Course content/Course Competencies mapping matrix

Topic	Course Competences																						
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18	c19	c20	c21	c22	c23
Introduction				1				1							1	1	1	1	1				
Basic Definitions.				1				1												1	1	1	1
Laws of Boolean algebra.	1		1		1	1	1		1		1	1					1	1		1		1	1
Logic Functions Representation & Realization	1		1		1	1	1		1		1	1					1	1	1			1	1
Methods of representation of logic functions truth table, S.O.P and P.O.S).	1		1		1	1	1		1		1	1		1				1		1	1	1	1
Realization of logic functions using AND-OR_NOT, NAND only and NOR only gate systems.	1												1	1	1	1		1	1	1			
Matching logic functions with gate systems.	1		1	1	1	1			1	1	1	1	1		1	1	1		1	1		1	
Logic function minimization	1			1	1	1	1		1		1	1	1	1	1	1							1
Using basic laws of Boolean.	1		1	1	1	1			1	1	1	1	1		1	1	1				1		1
Using karnaugh map minization.		1	1												1		1			1			
Using Quine-Mc Clusky's Methods.	1														1						1	1	1
Minimization of multiple-output Logic Functions.	1														1					1		1	
Combinational logic modules	1	1	1					1													1		1
Half and full adders, Parallel adder connection, look ahead carry.	1	1	1		1		1	1		1	1	1	1	1	1	1	1			1	1	1	1
Decoders and demultiplexers	1	1	1					1			1		1		1	1	1			1	1		
Encoders	1			1	1	1	1		1		1	1	1	1	1	1							
Data selectors (multiplexers)	1		1	1	1	1			1	1	1	1	1		1	1	1				1	1	1
Parity checkers.	1		1	1	1	1			1	1	1	1	1		1	1				1			
Read only memories.	1		1	1	1	1			1	1	1	1	1		1	1						1	1
Binary																				1	1		1

comparators.																				1	1		
Sequential logic circuit elements																							
State diagram and state table representation of sequential circuits.	1		1	1	1	1			1	1	1	1	1		1	1	1				1		
Asynchronous and synchronous sequential elements	1		1	1	1	1			1	1	1	1	1		1	1				1			
S-R Flip-Flop, and J-K Flip Flop.	1		1	1	1	1			1	1	1	1	1		1	1				1			
D Flip-Flop, and T Flip Flop.	1		1	1	1	1			1	1	1	1	1		1	1	1	1	1	1	1		
Racing in sequential circuits.	1		1	1	1	1			1	1	1	1	1		1	1							
Master-slave and Edge-triggered Flip-Flops.	1		1	1	1	1			1	1	1	1	1		1	1	1						
Sequential logic circuit modules	1		1	1	1	1			1	1	1	1	1		1	1							
Introduction.	1		1	1	1	1			1	1	1	1	1		1	1							
Registers and shift registers	1		1	1	1	1			1	1	1	1	1		1	1	1						
Asynchronous and synchronous counters	1		1	1	1	1			1	1	1	1	1		1	1			1				
Counter using shift-registers (Johnson and ring counters)	1		1	1	1	1			1	1	1	1	1		1	1				1	1	1	
Random access memories (basic cell, addressing and read-write operations)	1		1	1	1	1			1	1	1	1	1		1	1		1	1	1		1	
Topics Covering Competencies	28	4	24	20	23	20	6	5	22	19	24	23	22	5	26	23	15	12	10	15	15	14	2

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1					1	1	1			1	
c2	1			1	1					1	1		1	1	
c3	1			1	1	1				1	1		1	1	
c4	1			1	1		1	1		1	1			1	
c5	1	1				1				1		1	1		
c6	1		1	1			1			1	1			1	
c7	1			1		1				1	1	1	1		
c8	1		1				1			1				1	
c9	1	1		1		1				1	1	1	1	1	
c10	1		1			1			1	1		1	1	1	1
c11	1			1	1					1	1		1	1	
c12	1		1		1		1		1	1				1	1
c13	1		1				1		1	1				1	1
c14	1		1				1	1	1	1			1	1	1
c15			1		1		1	1	1	1				1	1
c16	1			1	1		1			1	1		1		
c17	1		1	1		1				1	1	1		1	
c18	1		1	1				1	1	1	1				1
c19	1			1	1	1	1			1	1	1	1	1	
C20	1		1		1	1				1		1			
C21	1	1											1	1	
C22		1	1		1		1						1	1	
C23	1		1	1	1		1			1	1			1	1
Σ	21	4	12	13	11	8	11	4	7	21	13	7	12	18	7

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 6 weeks)	Semester Work
	Reports/Research	Two reports per semester	
	Tutorials	3 Assignments per semester	
	Mini project	Once per semester	
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- 1- Digital logic circuit "Theoretical part"
- 2- Digital logic circuit "Practical part"

7-2 Required books

- Mohi Eldin Rateb, 2002, Digital Logic Circuits, Modern Academy Press.
- Mano, M.M, and Kime, C.R, 2000, Logic and Computer Design Fundamental, 2nd ed., Englewood cliffs, NJ: Prentice Hall.
- Nelson, V.P, Nagel, H.T., Carroll, B.D., and Irwin, J.D, 1995, Digital Logic Circuit Analysis and Design, NJ: Prentice Hall.

7-3 Recommended books: None

- Warkely, J.F, 2000, Digital Design: Principles and Practices, 2nd ed. Englewood cliffs, NJ: Prentice Hall.
- Mano, M.M Hall, 1991, Digital Design 2nd ed. Englewood cliffs, NJ: Prentice.

7-4 Periodicals, Web sites, etc.

www.prenhall.com/mano (Last accessed March, 2021)

8- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Complete Lab for digital logic circuits.

Course coordinator:

Dr. Abdel Moneam Elmahdy

Head of the Department:

Dr. Abd Elmoneim FoudA

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn114: Modern Theory of solids

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:	August 2020

B - Basic Information

Title: Modern Theory of solids	Code: ELCn114	Level: 1 st Fall	
Credit Hours: 2	Lectures: 1	Tutorial/Exercise: 2	Practical: 1
	Pre-requisite: PHYn002		

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding the weak points in classical theory of physics and how it can be explained by modern theory of physics. They can understand 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. The students can understand the defference between general and special theory of relativity then they can study in some detals Einstein concepts and the special theory of relativity

2 – Competencies

- c1- Describe the Electromagnetic spectrum and explaine the effect of temperature Blackbody Radiation. (C1, 16)
- c2- Study classical mechanics of the black body radiation. (C1, C17)
- c3 - Explain the theoretical background of photoelectric effect and Compton scattering. (C2, C16)
- c4 - Deduce mathematical relations describing the energy of photon and electron. (C1, C2)
- c5 - Analyze, mathematically, the effect of the collision between photons. (C1, C17)
- c6 - Use experimental facilities to explain Particle wave duality nature. (C15, C17)
- c7- Apply the Wave Mechanics to callculate the energy, wave function and probability density of particles. (C1, C2)
- c8 - Deduce mathematical relations describing penetration and the effective parameters on Tunneling. (C1, C2)
- c9 - Classify and compare the different ways of the conductivity elements. (C3, C15)
- c10 - Explain the theoretical background Bohr Model and THE Quantum Mechanical Model of H- Atom. (C1, C2)
- c11 – Study the Einstein concepts and some setails of theory of relativity. (C3, C4, C14)
- c12 - Work in a team and involve in group discussion and seminars. (C2, C3, C7)
- c13 - Differentiate between the classical and special relativity. (C5, C10)
- c14 - Communicate effectively and present data and results orally and in written form. (C5, C8, C14)
- c15 - Search for information's in references and in internet. (C5, C9)
- c16 - Use ICT facilities in presentations. (C8, C9, C14)
- c17 - Practice self-learning and communicate effectively orally and in written form. (C7, C8)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C7, C8, C9, C10, C14, C15, C16, C17,**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Introduction to quantum physics -Classical and modern theory of light	2		2
2	• Plank's explanation for black body radiation	2	1	2
3	• Photo electric effect -Compton scattering	2	1	2
	➤ Particles behaving as a wave and particle wave complementarity			
4	• Introduction to wave mechanics	2	1	2
5	• The uncertainty principle	2	1	2
6	• Wave function for free particle and probability	2	1	2
7	➤ Midterm exam	2	1	2
8	• The simple harmonic oscillator • Scanning tunneling microscopy	2	1	2
	• Introduction to atomic physics			
9	➤ The concepts of quantum physics	2	1	2
10	• Boher concepts, quantum theory and quantum numbers	2	1	2
11	• Introduction to relativity- classical relativity – frame of reference	2	2	2
12,13	➤ Galilean transformations - Special relativity – Lorentz transformation	4	2	4
14,15	• Time Dilation - Length contraction - Addition of Velocities- Relativity of Mass - Forces, Work, and Energy in Relativity	4	2	4
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix:

Topic	Course Competencies																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
Introduction to relativity- classical relativity – frame of reference		1											1	1	1	1	1
Galilean transformations - Special relativity – Lorentz transformation													1	1	1		1
Time Dilation - Length contraction - Addition of Velocities- Relativity of Mass - Forces, Work, and Energy in Relativity													1	1	1	1	1
Introduction to quantum physics -Classical and modern theory of light	1	1	1	1							1		1	1	1	1	1
Plank's explanation for black body radiation	1		1								1		1	1	1		1
Photo electric effect -Compton scattering	1	1	1		1	1			1		1		1	1		1	1
Particles behaving as a wave and particle				1	1	1	1				1		1	1	1		1

wave complementarity																	
Introduction to wave mechanics						1	1				1	1	1	1			1
The uncertainty principle					1		1					1	1	1			1
Wave function for free particle				1		1	1	1				1	1	1			1
Applications of wave mechanics							1	1			1	1	1	1	1	1	1
The simple harmonic oscillator				1						1	1		1	1	1	1	1
Scanning tunneling microscopy										1	1	1	1	1	1	1	1
Introduction to atomic physics				1					1	1	1	1		1	1	1	1
Bonding mechanisms										1		1		1	1	1	1
Classical free electron model of metals										1		1	1	1	1	1	1
Topics Covering Competences	3	3	3	4	3	4	4	4	2	3	7	7	13	16	15	10	16

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizzes	Assignments
c1	1	1	1	1	1	1	1	1
c2	1	1	1	1	1	1	1	1
c3	1	1	1	1	1	1	1	1
c4	1	1	1	1	1	1	1	1
c5	1	1	1	1	1	1	1	1
c6	1	1	1	1	1	1	1	1
c7	1	1	1	1	1	1	1	1
c8	1	1	1	1	1	1	1	1
c9	1	1	1	1	1	1	1	1
c10	1	1	1	1	1	1	1	1
c11	1	1	1	1	1	1	1	1
c12	1	1	1	1	1			1
c13	1	1	1	1	1	1	1	1
c14	1	1			1	1	1	1
c15		1						
c16		1						
c17		1						
Σ	14	17	13	13	14	13	13	14

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	20
	Reports/Research		
	Assignments		
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-3 Course notes:

A. H. Serag, S. A. Eladly (2020), Modern Theory of Solids, Lectures notes, Modern Academy.

7-2 Required books:

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

7-11 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.

7-4 Periodicals, Web sites, etc.

[www. Physics.exchange.com](http://www.Physics.exchange.com)

www.iop.org.com

8- Facilities required for teaching and learning:

- Modern theory Lab.
- Library.
- Internet.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Sally El-Adly

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Differential Equations and Transforms

Code: MTHn103

Level: 1st (Fall-Spring)

Credit Hours: 3

Lectures: 2

Tutorial/Exercise:3

Practical: ---

Pre-requisite: MTHn002

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge, skills, and attitudes) related to 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 – Competencies

- c1- Identify classification of O.D.E. (C1)
- c2- Explain solution of the O.D.E using suitable methods. (C1, C5)
- c3- Identify rules of Laplace transform. (C1, C5)
- c4- Explain rules of inverse Laplace transform. (C1, C5)
- c5-Apply Fourier series and its applications in applied engineering problems. (C1, C5)
- c6- Identify basic concepts of Legendre function. (C1, C5)
- c7- Identify basic concepts of Bessel function. (C1, C5)
- c8- Choose the suitable methods for solving O.D.E. (C1, C7, C9)
- c9- Apply rules of Laplace transform and its inverse to Solve O.D.E and integral equations. (C1, C5, C7, C9)
- c10- Make analysis for electrical problem using Fourier series. (C1, C2)
- c11- Solving problems on Legendre and Bessel functions. (C1, C9)
- c12- Apply O.D.E in electrical, mechanical and civil problems. (C1, C7, C9)
- c13- Apply Laplace transform in electrical, mechanical and civil problems. (C1, C7, C9)
- c14- Apply Fourier series in electrical, mechanical and civil problems. (C1, C7, C9)
- c15- Communicate effectively. (C8)
- c16- Search for information. (C9, C10)

This course contributes in the following program competencies: **C1, C2, C5, C7, C8, C9, C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Definitions, order, degree.	1	1	—
2,3,4	➤ 1st order differential equations, 2nd order and n th order differential equations with constant coefficients.	6	10	—
5,6	➤ Nonhomogeneous D.E., undetermined coefficient method.	6	10	—
7	➤ Mid term	2	2	
8	➤ Variation of parameters, Euler equations, practical D.E.	3	4	—
9,10	➤ Laplace transform, 1st and 2nd shifting theorem.	4	6	—
11,12	➤ Laplace transforms of derivative and integrals, inverse Laplace transforms, convolution, applications.	4	6	—
13,14,15	➤ Fourier series, half rang expansion, Legendre and Bessel functions.	4	6	—
Total hours		30	45	—

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies															
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16
Definitions, order, degree.	1															1
1st order differential equations, 2nd order and n th order differential equations with constant coefficients.		1						1				1				1
Nonhomogeneous D.E., undetermined coefficient method		1						1				1				1
Variation of parameters, Euler equations, practical D.E.		1						1				1				1
Laplace transform, 1st and 2nd shifting theorem			1						1				1		1	1
Laplace transforms of derivative and integrals, inverse Laplace transforms, convolution, applications.			1	1					1				1		1	1
Fourier series, half rang expansion, Legendre and Bessel functions.					1	1	1			1	1			1	1	1
Topics Covering Competences	1	3	2	1	1	1	1	3	2	1	1	3	2	1	3	7

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
c1	1	1	1	1				1
c2	1		1	1	1	1	1	1
c3	1	1	1	1	1	1	1	1
c4	1	1	1	1	1	1	1	1
c5	1		1	1		1	1	1
c6	1	1	1	1		1	1	1
c7	1	1	1	1		1	1	1
c8	1	1		1		1	1	1
c9	1		1	1		1	1	1
c10	1	1	1	1	1	1	1	1
c11	1			1	1	1	1	1
c12	1	1			1			
c13	1	1			1			
c14	1	1		1	1			
c15		1	1		1			1
c16	1			1	1			1
Σ	15	11	10	13	10	10	10	13

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

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

7-2 Required books:

Bronson, R. and Costa, G. (2012) Schaumas easy out lines diffrential equations. McGraw-Hill, U.S.A.

7-12 Recommended books:

Kreyszig, E. (2010) Advanced Engineering Mathematics. John Wiley, New York.

7-4 Periodicals, Web sites, etc.

www.mathwords.com.

www.khanacademy.org/math/differential-equations

www.sosmath.com/diffeq/diffeq.html

8- Facilities required for teaching and learning:

- Library.
- Internet.
- High speed internet and communication facilities for distance learning

Course coordinator: Associat Professor / Ashraf Taha EL-Sayed
Head of the Department: Associat Professor / Ashraf Taha EL-Sayed
Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification GENn141a: Presentation skills

A- Affiliation

Relevant program:

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

August 2020

B - Basic Information

Title: Presentation skills

Code: GENn141a

Level: 2nd Fall

Credit Hours: 2

Lectures: 2

Tutorial/Exercise: - Practical: -

Pre-requisite: --

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 – Competencies:

- c1. Practice research, select relevant topics, and allocate relevant references. (C5, C10)
- c2. Prepare and present technical reports. (C5)
- c3. Summarize and write a report about the selected topic (C8)
- c4. Prepare a presentation, give a speak, and involve in discussion about the selected topic. (C8).
- c5. Collaborate & communicate effectively within multidisciplinary team & audience (C7, C8)
- c6. Lead and motivate individuals (C7, C9)
- c7. Work in stressful environment and within constraints (C9)
- c8. Search for information and adopt life-long self-learning (C10)
- c9. Review topics related to humanitarian interests and moral issues (C9)
- c10. Practice self-expressing and verbal / non-verbal communication during interviews (C5, C8)
- c11. Understand how to negotiate well (C5, C7, C8)

This course contributes in the following program competencies: **C5, C7, C8, C9, C10**

3- Course Contents:

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	Introduction	2		
2	technical report writing + biography	2		
3	C.V Writing: Preparation of an attractive C.V. containing personal data qualifications, posts, and publications. - Interview Preparations + Interview skills	2		
4	Presentation skills (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)	2		
5	Presentation skills / communications skills	2		
6	To improve the student communications skills / Seminar training / Joharry's window & 7 C's	2		
7	Mid Term Exam	-	-	-
8	To develop the student acquiring power of leadership	2		
9	Training on active listening & Arts	2		
10	Negotiation skills	2		
11	To understand and practice what's body language	2		
12	Speeches vs. presentation	2		
13	Suggested topic by the students.	2		
14	Revision / group presentation	2		
15	Revision / group presentation	2		
16	Revision / group presentation	2		
Total hours		30		

4 - Course content/Course Competencies mapping matrix.

Course Topics	Course Competencies										
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11
technical report writing + biography	1	1	1		1	1		1			
C.V Writing: Preparation of an attractive C.V. containing personal data qualifications, posts, and publications. - Interview Preparations + Interview skills			1	1					1	1	1
Presentation skills (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	1	1	1	1	1	1	1	1		1	

talk through a lab top and a data show / Seminar training)												
Presentation skills / communications skills	1	1	1	1	1	1	1	1	1	1	1	
To improve the student communications skills / Seminar training / Joharry's window & 7 C's						1	1	1		1	1	1
To develop the student acquiring power of leadership						1	1	1		1	1	1
Training on active listening & Arts	1	1	1	1	1	1	1	1	1	1	1	
Negotiation skills						1		1	1	1	1	1
To understand and practice what's body language						1					1	
Speeches vs. presentation	1	1	1	1	1	1	1	1	1		1	
Suggested topic by the students.		1				1			1		1	
Revision / group presentation		1				1	1		1		1	
Topics Covering Competencies	5	7	6	5	11	8	7	8	6	11	4	

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods					Learning Methods				Assessment Method				
	Lecture	Tutorials	Problem solving	Laboratory & Experiments	Discussions & seminars	Self - Learning	Research & Report	Assignments	Discussions & seminars	Oral Exam	Quizzes	Assignments	Research & Report	Mini - Project
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	1	
c4	1	-			1	1	1	1	1			1	1	
c5	1	-			1		1		1				1	
c6	1	-			1		1		1		1		1	
c7	1	-			1		1		1				1	
c8	1	-			1	1	1		1	1	1		1	
c9	1	-			1				1					
c10	1	-			1				1	1	1			
c11	1	-			1				1	1				
Σ	11	-	-	-	11	3	8	4	11	4	5	4	8	-

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	-	-
	Reports/Research/biography	A group of students make a report every week	20
	Presentation	A group of students presents every week	12
	Other (CV)	Each student make a his CV once	8
Practical Exam		-	-
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes

Presentation and Communication Skills "Theoretical part"

7-2 Required books

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

7-3 Recommended books

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

7-4 Periodicals, Web sites, etc.

1. https://youtu.be/pgkAwCd_ST4
2. <https://youtu.be/L01RXFIS9lw>
3. https://youtu.be/k_pi2T6Gr04
4. <https://youtu.be/BCu7E5TPFvl>
5. <https://youtu.be/nFx50rZHze8>
6. <https://youtu.be/bV6RSS346eQ>
7. <https://youtu.be/qzaNbciiuJQ>
8. https://youtu.be/qy9fvj_I8UA
9. <https://youtu.be/26WqgLPdQ0>
10. <https://youtu.be/a-J1clinINk>
11. <https://youtu.be/62dYn2007KQ>
12. <https://drive.google.com/drive/folders/1GACxYWiPgJLHyvRnzB1nB2XaMrKJOcP?usp=sharing>

8 - Facilities required for teaching and learning:

- Computer, and Data show

Course coordinator:

Dr. Lubna Fekry

Head of the Department:

Prof. Dr. Shouman S.E.I.

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ENGN311a: Engineering Economy

A- Affiliation

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

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

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

Date of specifications approval: August 2020

B - Basic Information

Title: Engineering Economy

Code: ENGN311 **Level:** 2nd /Fall

Credit Hours: 2

Lectures: 2 **Tutorial/Exercise:** 1

Practical: -

Pre-requisite: None

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 – Competencies

- c1- Apply mathematics, economics, and engineering principles to to identify, formulate, analyze, and solve engineering economic problems (C1, C4).
- c2- Use 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. (C1, C10)
- c3- Estimate and calculate the effects of both depreciation and taxes as well on economic evaluations (C2)
- c4- Develop an understanding of managerial accounting and economic principles. (C3)
- c5- Use appropriate techniques, skills, and tools to identify, formulate, analyze, and solve engineering economic problems. (C1, C9)
- c6- Communicate effectively – graphically, verbally and in writing – the results of the modeling process to solve engineering economy problems with specialist users of engineering analyses. (C8)
- c7- Adopt creative, innovative and flexible thinking for modeling solution process for economic problems. (C14)
- c8- Use modern computer tools, such as spreadsheets, in financial realities from the business world including both opportunities and restrictions- that influence economic decisions. (C9, C10, C14)
- c9- Use graphics effectively for justifying solutions to engineering economics problems. (C11)
- c10- Search for information in references and internet. (C10, C12)
- c11- Practice self-learning (C5, C10).
- c12- Work in a team and involve in group discussion and seminars. (C7)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C7, C8, C9, & C10**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	• Cash Flow: Cash flow table, Cash flow diagram,	1	1	
1	➤ Equivalence and time Value of Money,	1		
2	• Interest: Simple & compound interest	2		
3	➤ Forms of payments: Single payment, Uniform payment.	2	1	
4	➤ Arithmetic series payment, Geometric series payment	2	1	
5	➤ Nominal & effective Interest rate	2		
6	• Economic Analysis of Engineering Problems: ➤ : Present worth method,	2	1	
7	Assessment (Mid Term Exam)	2	1	
8	➤ Equivalent uniform annual method	2	1	
9	➤ Rate of return method	2	1	
10	• Depreciation ➤ Straight- line method	2	2	
11	➤ Sum – of- years digits method,	2	1	
12	➤ Double- declining balance method	2	1	
13	• Tax Effects ➤ Types of taxes	1		
13	➤ Tax credit	1	1	
14	➤ Marginal taxes.	1	1	
15	➤ Effect of taxes on economic decision.	3	2	
Total hours		30	15	

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Cash Flow: Cash flow table, Cash flow diagram,	1			1	1							1
Equivalence and time Value of Money,	1			1	1							1
Interest: Simple & compound interest	1			1	1		1	1	1			1
Forms of payments: Single payment, Uniform payment.				1	1		1	1	1			1
Arithmetic series payment, Geometric series payment				1	1		1	1	1			1
Nominal & effective Interest rate				1	1		1	1				1
• Economic Analysis of Engineering Problems: Present worth method,	1	1			1	1		1	1			1
Equivalent uniform annual method	1	1			1	1		1	1			1
Rate of return method	1	1			1	1		1	1			1
• Depreciation Straight- line method	1		1		1	1			1	1		1
Sum – of- years digits method,	1		1		1	1			1	1		1
Double- declining balance method	1		1		1	1			1	1		1
• Tax Effects Types of taxes			1		1						1	

Tax credit			1		1					1	1	
Marginal taxes.			1		1					1	1	
Effect of taxes on economic decision.	1		1		1	1			1			1
Topics Covering Competences	10	3	7	6	16	7	4	7	10	5	3	13

5 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	
c5	1	1	1	1	1		1		1	1	1		1	1	
c6		1	1				1	1						1	1
c7	1	1	1	1	1		1	1	1	1	1		1	1	1
c8	1	1	1	1	1		1			1	1		1	1	
c9	1	1	1	1	1		1			1	1		1	1	
c10		1	1				1	1						1	1
c11		1	1				1	1						1	1
c12	1	1	1	1	1		1		1		1				
Σ	8	9	9	8	8		11	5	3	7	8		7	8	4

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: ➤ Assignments, ➤ Quizzes ➤ Reports	Bi-Weekly 4 Quizzes per semester 1 Report per semester	10 20 10
Mid-Term Exam	7-th Week	20
Final Written Exam	Sixteenth week	40
Total		100

7- List of references:

7.1 Course notes

Lecture notes and handouts.

7.2 Required books

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

7.3 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

7.4 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>

8- Facilities required for teaching and learning:

- Modern Academy Library
- Lecture and Exercise rooms equipped with projector and sound systems.
- Computer, Data show and Computer programs.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Metwally Hussein Metwally
Head of the Department: Dr Metwally Abdelghaffar
Date: August 2020

Modern Academy
for Engineering and Technology in Maadi



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: August 2020

B - Basic information

Title: Data Structures and Algorithms **Code:** **Level:** Sophomore, Second Semester
CMPn110
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 have gained the planned competencies (based on the knowledge , skills and personnel attitudes) related to construction and operations of the different data structures, their storage in computer memory and their implementation. They should compete on the design , implementation and execute of different algorithms like manipulation of data structures , searching and sorting.

2 – Competencies

- c1- Classify and compare different methods of data representation (C1, C2 , C3)**
- c2- design** complex programs using algorithms and programming concepts (C1,C2,C3)
- c3- practice** Storage of data in computer memory like one and two-D arrays, records, and spare matrices (C2, C11, C16 , C17)
- c4- Apply Operations associated with stacks, and queues (C1, C2, C3, C11,C16, C17).
- c5- Design of representation of different models of linked lists in memory (C1, C2, C3, C11, C16, C17).
- c6- Apply Traversing, searching, insertion, and deletion algorithms for linked lists (C1, C2, C3, C11, C16, C17).
- c7- Use different representations of trees in computer memory (C1, C2, C3, C11, C16, C17).
- c8- Apply and use traversal algorithms of trees data structures such as pre-order, in-order and post-order traversals (C1, C2, C3, C11, C16, C17).
- c9- Apply Huffman’s algorithm and deduce weighted Path length of trees (C1, C2, C3, C11,C16, C17, C18).
- c10- Design , use and implement linear and binary searching algorithms, and associated binary search tree (B.S.T) with searching, deletion, and insertion into B.S.T (C1, C2, C3, C11,, C12, C16, C17, C18).
- c11- Practice sorting algorithms using selection, exchange, insertion, bubble, quick, and heap sort algorithms and deducing the algorithms complexity (C1, C2, C3, C11, C12, C16, C17, C18).
- c12- -Deduce the proper data structures and algorithms for problems arising in the engineering field (C1,C2 , ,C16, C17)
- c13- Communicate effectively through written reports (C8).

This course contributes in the following program competencies: **C1, C2, C3,, C8, C11, C12, C15, C16, C17, & C18**

3- Contents:

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	<ul style="list-style-type: none"> ➤ Introduction • Basic Definitions and basic operation. • Data representation and storage, fixed point and floating point formats. • Applications of data structure. 	2	2	-
2,3	<ul style="list-style-type: none"> ➤ Arrays • 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. 	4	4	-
4,5	<ul style="list-style-type: none"> ➤ Linear lists • Definitions and properties. • Stacks, definition, push, pop operation. • Queues, definition, insertion, and deletion from circular queues. • De-queues, definition, and basic operations. 	4	4	-
➤ 6	➤ Linked Lists: Basic structures and representation	2	2	
➤ 7	➤ MT (assessment)	2	2	
➤ 8	<ul style="list-style-type: none"> ➤ Linked Lists • Traversing and searching linked lists • Insertion and deletion algorithms. • Two-way lists. • Circular header linked lists and applications 	2	2	-
➤ 9,10,11	<ul style="list-style-type: none"> ➤ Trees • Basic definitions and structure. • Representation of binary trees in memory. • Linked representation. • String array representation. • Terminating binary sequence (TBS) representation. • Transformation of a general tree into binary tree. • Transferring tree and transversal algorithms using stacks (Preorder, in order, and post order threading) • Path length and Huffman's tree achieving using Huffman's algorithms. 	5	5	-
➤ 11, 12	➤ Searching	3	3	-
	• Introduction and searching types.			
	• Scanning.			
	• Direct scanning and controlled scanning.			
	• Binary search algorithms.			
• Binary search trees.				

	<ul style="list-style-type: none"> • Definition. • Searching and insertion into B.S.T. • Deletion from a B.S.T. • Building a B.S.T 			
➤ 13, 14	<ul style="list-style-type: none"> ➤ Sorting <ul style="list-style-type: none"> • Introduction. • Sorting algorithms using selection, exchange, insertion • Complexity of algorithms. • Bubble sort algorithms as an example for exchange technique. • Binary sort (quick sort) algorithm. • Heap sort algorithms. 	4	4	-
15	<ul style="list-style-type: none"> • Revision and class projects demonstration 	2	2	
Total hours		30	30	-

4. Course contents / course Competencies mapping matrix:

Topic	Course Competencies												
	c1	C2	c3	C4	C5	c6	c7	c8	c9	c10	c11	c12	c13
➤ Introduction	1							1					
<ul style="list-style-type: none"> • Basic Definitions and basic operation. • Data representation and storage, fixed point and floating point formats. • Applications of data structure. 													
➤ Arrays		1	1									1	1
<ul style="list-style-type: none"> • Storage of one and two dimensional arrays in memory. 													
Pointer arrays , parallel array storage of records		1	1									1	1
Operations on matrices and associated algorithms		1	1									1	1
Storage of sparse matrices		1	1									1	1
➤ Linear lists			1	1								1	1
Definitions and properties.													
<ul style="list-style-type: none"> • Stacks, definition, push, pop operation 			1	1								1	1
<ul style="list-style-type: none"> • Queues, definition, insertion, and deletion from circular queues. 			1	1								1	1
➤ Linked Lists: Basic structures and representation					1							1	1
➤ Linked Lists :Traversing and searching linked lists					1							1	1
<ul style="list-style-type: none"> • Insertion and deletion algorithms. 					1							1	1
<ul style="list-style-type: none"> • Two-way lists. And Circular header linked lists and applications 					1							1	1
➤ Trees						1						1	1
<ul style="list-style-type: none"> • Basic definitions and structure. 													

• Representation of binary trees in memory.				1		1						1	1
• Linked representation.				1	1	1						1	1
• String array representation.				1		1						1	1
• Terminating binary sequence (TBS) representation.						1	1	1	1			1	1
• Transformation of a general tree into binary tree.						1	1	1	1			1	1
• Transferring tree and transversal algorithms using stacks (Preorder, in order, and post order)						1	1	1	1			1	1
Path length and Huffman's tree achieving using Huffman's algorithms						1	1	1	1			1	1
Linear and binary searching										1		1	1
BST						1	1	1	1	1		1	1
Linear Sorting Algorithms											1	1	1
Heap Sort							1	1	1	1	1	1	1
Topics Covering Competences	1	4	7	6	5	9	6	7	6	3	2	23	23

5 - Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method				
	Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Computer Programming	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments	
c1	1			1	1				1		1		1	
c2	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			
c7	1	1	1		1				1		1		1	
c8	1		1	1	1				1		1		1	
c9	1			1	1		1		1		1		1	
c10	1	1		1	1				1		1			
c11	1		1		1				1		1		1	
c12							1					1		
c13							1					1		
Sum	11	3	4	8	10	3	4	0	11	0	11	2	8	

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	12
	Reports/Research	Two reports per semester	8
	Tutorials	3 Assignments per semester	4
	Mini project	Once per semester	16
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Data structures theory & Algorithms. (Dr. Khaled Ahmed Morsy)

7-2 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

7-3 Recommended books:

- Glenn W. Rowe, Introduction to Data Structures and Algorithms with C++, Prentice Hall, 1991.

7-4 Periodicals, Web sites, etc.

None

8. Facilities required for teaching and learning:

Lecture, Computer Labs. And Data show

Course coordinator: Dr. Khaled Morsy
Head of the Department: Dr. Abd Elmoneim Fouda
Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn112: Electrical Circuit Analysis-2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: August, 2020

B - Basic Information

Title: Electrical Circuit Analysis-2 **Code:** ELCn112 **Level:** 2nd Fall
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**5
Pre-requisite: ELCn111

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 – Competencies

- c1- Understand Basic concepts of power calculations in sinusoidal steady state. (C1, C5)
- c2- Understand Basic concepts of the balanced three-phase circuits. (C5, C9)
- c3- Analyze Principles of mutual inductance. (C7, C9)
- c4- Realize Principles of series and parallel resonance. (C1, C7)
- c5- Implement Laplace transforms theory. (C5, C9)
- c6- Analyze Transfer function. (C1, C5, C7, C9)
- c7- Implement Principles of the two-port circuits. (C5, C9)
- c8- Use the principles of the balanced three-phase circuits. (C1, C5)
- c9- Apply the principles of series and parallel resonance. (C10, C14)
- c10-Apply the Laplace transformation technique to circuit analysis. (C5, C14, C17)
- c11-Use the transfer function. (C1, C5)
- c12- Apply the principles of two-port circuits in circuit's analysis. (C1, C5)
- c13- Estimate the cost of the electricity bill. (C1, C5)
- c14-Improve the power factor for companies and industrial factors. (C9, C14)
- c15-Implement the achieved knowledge to recognize 3-phase balanced circuits and its analysis. (C9, C14)
- c16-Analyze the given realized circuits excited by other than sinusoidal sources. (C1, C5, C9)
- c17-Design the frequency- selective circuit. (C1, C13)
- c18-Implement the techniques of two- port terminated network and analyze it to obtain its characteristics. (C13, C14).
- c19- Communicate effectively through reports and e- mails. (C5, C9, C10)
- c20-Manage tasks, time, and resources effectively. (C9, C10)
- c21-Search for information and engage in life-long self-learning discipline. (C9, C10)

This course contributes in the following program competencies: **C1, C5, C7, C9, C10, C13, C14 & C17.**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Sinusoidal steady- state analysis.	2	3	-
2	Techniques of circuit analysis in AC.	4	6	-
3	Sinusoidal steady- state power calculation	2	6	-
4	Balanced three- phase circuit.	2	6	-
5	Introduction to Laplace- Transform.	2		
6	Laplace- Transform circuit analysis.	2	3	-
7	Assessment (Mid- Term)	3	6	-
8	Techniques of circuit analysis using Laplace- Transform.	-	-	-
9		3	6	-
10	Frequency selective circuits.	1		
11		4	3	-
12	Two- ports networks.	1		
13		1	3	-
14	Revision	1		
15		2		
Total hours		30	45	-

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies																				
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18	c19	c20	c21
Sinusoidal steady-state analysis.	1	1																			
Techniques of circuit analysis in AC.	1	1			1		1				1					1				1	1
Sinusoidal steady-state power calculation	1	1				1		1		1				1	1			1			
Balanced three- phase circuit.		1			1	1		1	1	1		1			1	1					
Introduction to Laplace- Transform.					1					1		1	1		1		1		1		
Laplace- Transform circuit analysis.					1					1		1	1		1	1					1
Techniques of circuit analysis using Laplace- Transform.					1					1		1									
Frequency selective									1		1			1			1				

circuits.																													
Two- ports networks.																					1	1	1	1					
Topics Covering Competencies	3	4	3	2	5	2	1	2	2	5	2	4	2	2	4	3	2	2	2	2	2	2	3						

5 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	Teaching Methods							Learning Methods			Assessment Method				
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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				
c5	1			1	1			1		1	1		1	1	1
c6	1		1	1	1					1	1		1		
c7	1	1		1						1	1		1		
c8	1			1			1			1	1		1		1
c9	1	1	1	1			1	1	1	1	1		1		1
c10	1			1	1					1	1		1		1
c11	1			1	1			1		1	1		1		1
c12	1			1			1	1		1	1				1
c13	1	1	1	1	1		1		1	1	1			1	1
c14	1			1	1		1	1		1	1			1	
c15	1			1				1		1	1		1	1	
c16	1			1						1	1				
c17	1			1	1		1			1	1				1
c18	1							1						1	
c19	1														
c20															
c21			1	1				1						1	
Σ	19	3	5	17	9	-	7	10	2	17	17	-	10	8	9

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	12
	Reports/Research	Two reports per semester	8
	Tutorials	3 Assignments per semester	12
	Mini project	Once per semester	8
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Electrical Circuit Analysis-2 “Theoretical part”.

7-2 Required books

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

7-3 Recommended books:

- James W. Nilsson, and Susan A. Riedel, Electric Circuits, Pearson Education Inc., 8th Edition, 2008.

7-4 Periodicals, Web sites, etc.

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

8- 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: Dr. Haytham Gamal.

Dr. Mohamed Ismail

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

Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn113: Electrical Measurements

A- Affiliation

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

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

Department offering the course: Electronic Engineering and Communication Technology Department

Date of specifications approval: August, 2020

B - Basic Information

Title: Electrical Measurements **Code:** ELCn113 **Level:** 1st Spring

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

Pre-requisite: ELCn111

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 - Competencies

- c1 Classify and compare the different system of units, analyze the measurement errors, accuracy classes and standards of measuring instruments (C1).
- c2 Investigate the construction of analog measuring instruments (C12, C13).
- c3 Explain the principles of operation and evaluate the performance of analog measuring instruments (C14, C15).
- c4 Deduce the principles of design, properties, procedures, and error analysis of different methods used for measuring electrical quantities (such as power, resistors, and storage elements) (C4).
- c5 Select and analyze the most appropriate electrical measuring circuit and instruments for a given electric measurement (V, I, P, R, or Z) (C2, C6).
- c6 Deduce the torque equation of the electrical measuring instruments (C1, C2).
- c7 Evaluate the properties of the electrical measuring instruments (C3, C9).
- C8 Investigate the effect of the measuring instruments on the accuracy of electrical measurements (C5, C7).
- C9 Analyze the resulting error of the electrical measurements (C10).
- c10 Design, assemble, and operate the most suitable electrical measuring circuit diagram from the measuring errors point of view (C3).
- c11 Calculate, and analyze the resulting systematic errors (C2, C14).
- c12 Use relevant electrical laboratory equipment and analyze the results correctly (C13).
- C13 Present data and results orally and in written form (C6, C10).
- C14 Prepare and present technical reports (C5, C9).

This course contributes in the following programs competencies: **C1, C2, C3, C4, C5, C6, C7, C9, C10, C12, C13 & C14**

3 – Contents

Week	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
➤	Assessment (Mid- Term)	-	-	-
➤	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	2
➤	Accurate measurements of very low, low, High, and very High Resistances.	4	2	4
➤	Capacitance and Inductance Measurements Using AC Bridges.	4	2	2
➤	Impedance measurements using resonance method.	2	1	2
➤	Revision	1	1	1
➤	Revision	1	-	1
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14
1. Units, Dimensions, and Standards.	1													1
2. Types and Analysis of Errors in Electrical Measurements.	1							1	1	1	1			
3. Fundamentals of Analogue Electrical Measuring Instruments.		1				1	1			1				
4. Deflection Type Permanent Magnet Moving Coil and Electro-dynamic Instruments.		1				1	1	1						
5. Galvanometers, and DC Multi-Range Voltmeters, and Ammeters.	1	1	1					1						

6. AC Rectifier Type Voltmeters and Ammeters.			1			1										
7. Series and Multi-Range Ohmmeters.			1										1			
8. DC and AC Electro-dynamic Voltmeters, Ammeters, and Wattmeters.		1	1										1			
9. DC and AC Power Measurements.						1				1						
10. Accurate measurements of very low, low, High, and very High Resistances.				1	1					1					1	
11. Capacitance and Inductance Measurements Using AC Bridges.				1	1					1	1				1	
12. Impedance measurements using resonance method.				1	1					1						
Topics Covering Competencies	3	4	4	3	4	3	2	3	5	3	1	2	2	1		

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods					Learning Methods			Assessment Method				
	Lecture	Tutorials	Problem solving	Laboratory & Experiments	Discussions & seminars	Self - Learning	Research & Report	Assignments	Written Exam	Practical Exam	Quizzes	Assignments	Research & Report
c1	1	1	1	1		1		1	1	1			1
c2	1	1	1			1						1	
c3	1	1					1		1				
c4	1	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	
c8	1	1		1					1	1		1	
c9		1		1					1	1		1	
c10			1	1				1	1	1	1		
c11			1	1				1	1	1		1	
c12				1						1			1
c13													
C14		1		1		1		1		1	1		
Σ	8	9	8	10	2	4	4	7	9	9	3	7	3

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Mid-Term Exam	7 th Week	20
Semester Work	Quizzes	3 rd and 4 th Weeks
	Reports	Two reports per semester
	Assignments	2 Assignments per semester
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes:

- Shouman, S. E.I., (2019) ELCN 113, *Electrical Measurements*, Cairo, Egypt.
- Shouman, S.E.I., (2019) ELCN 113: *Electrical Measurements (Lab.)*, Cairo, Egypt.

7-2 Required books: Non..

7-3 Recommended books:

- Morris, S.A. and Langari, R., (2016) *Measurement and Instrumentation Theory and Application*, Academic Press, London Wall, UK.
- Hefrick, A.D. and Cooper, W.D., (2012) *Modern Electronic Instrumentation and Measurement Techniques*, PHI Learning, New Delhi, India.

7-4 Periodicals, Web sites, etc.

- IEEE Transactions on Instrumentation and Measurement, Last accessed November 15, 2020.
- <http://folk.uio.no/trulsn/images/Electrical-measurements.pdf>, Last accessed November 20, 2020.
- https://lecturenotes.in/materials/14532-electrical-measurements-and-measuring-instruments?utm_source=subjectpage&utm_medium=web&utm_campaign=materialpage, last visited January 2021.

8- Facilities required for teaching and learning:

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

Course coordinator: Prof. Dr. Shouman S.E.I.

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

Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification GENn142: Technical Report Writing

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Manufacturing Engineering and Production Technology Department
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:	August 2020

B - Basic information

Title: Technical Report Writing	Code: GENn142	Level: 1 st -2 nd (Spring)	
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 students to introduce the basic concepts of writing technical reports, resume's, CVs and research papers.

2 – Competencies

- c1- Study rhetorical models of writing. (C5)
- c2- Write paragraphs and peer edit them using error detection.(C8)
- c3- Identify different types of technical reports. (C5)
- c4- Enhance methodology of analyzing the engineering data. (C5)
- c5- Develop clear understanding of the effects of word choice, sentence structure, organization and document design. (C6)
- c6- Recognize the elements of technical reports and Implement the methodology of technical writing. (C8)
- c7- Use the correct expressions and analytical reading. (C8)
- c8- Practice using the conventional style of using visuals equations, tables and figures,. (C8)
- c9- Interact professionally with other writers and their writings. (C8)
- c10- Utilize knowledge and scientific findings with other people and Perform report and manual writing . (C5)
- c11- Present findings of scientific research in seminars and workshops. (C5)
- c12- Collaborate effectively with the group work and publishing strategies. (C5)

This course contributes in the following program competencies: **C5, C6 & C8**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	• Introduction: Paragraph writing	2		-
2	• Steps to a Successful Writing Assignment	2		-
3	• The Writing Process	2		-
4	• Elements of technical reports	4		-
5	• Research Papers and Reports	2		-
6	• Lab Reports	4		-
7	• Mid term	2		
8	• Resumes and Cover Letters	2		-
9	• Using Words Correctly	2		-
10	• Report and Thesis Layout	2		-
11	• Technical Writing Ethics	2		-
12	• A Structured Approach to Presenting Postgraduate Research Theses	2		-
13	• Publishing from the thesis	2		-
14,15	• Writing a research paper	2		-
Total Hours		30		-

4 - Course content/Course Competencies mapping matrix

Topic	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Introduction: Paragraph writing	1	1	1	1	1	1	1	1	1	1	1	1
Steps to a Successful Writing Assignment	1	1	1	1	1	1	1	1	1	1	1	1
The Writing Process	1	1	1	1	1	1	1	1	1		1	1
Elements of technical reports	1	1	1		1	1	1	1	1			1
Research Papers and Reports	1	1		1		1	1	1		1	1	1
Lab Reports	1	1	1	1	1	1	1	1		1		1
Revision 7 th week Exam	1		1		1	1		1				
Resumes and Cover Letters	1	1	1	1		1		1	1	1	1	1
Using Words Correctly	1	1	1		1	1		1		1	1	1
Report and Thesis Layout	1	1	1		1			1	1		1	
Technical Writing Ethics	1	1	1	1	1		1	1		1		1
A Structured Approach to Presenting Postgraduate Research Theses		1	1	1		1	1	1	1	1	1	
Writing a research paper	1	1	1	1	1		1	1	1	1	1	1
Topics Covering Competences	12	12	12	9	10	10	9	12	8	9	9	10

5-Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researched, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1		1				1			1			1		1
c2	1							1							
c3	1						1			1			1	1	1
c4	1		1					1							
c5	1							1						1	1
c6	1														
c7	1		1					1		1			1	1	1
c8	1						1							1	1
c9	1						1	1						1	
c10	1		1											1	1
c11	1		1				1	1							
c12	1						1	1						1	
Σ	12		6				6	7		3			3	7	6

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments and Reports	Bi-Weekly	20
Two Quizzes	5 th and 10 th	20
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes:

The Report Writing Book by Dr Neveen Samir , 2015

7-2 Required books

- Shelton, James, Handbook for technical writing, NTC publishing Group, Illinois, USA, 1998.
- Deborah, C.A. & Margaret D. Blicke (2001) **Technical Writing, Principles and Forms**, 2nd Ed., MacMillan Publishing.

7-3 Recommended books: Douglas Godfrey, **ASLE Author's Guide**, Jan. ,1997

7-4 Periodicals, Web sites, etc.:

www.technical-writing.com

8- Facilities required for teaching and learning:

Internet educational lab, Computer and Data show

High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Neveen Samir

Head of the Department:

Prof. Dr. Ashraf Taha

August 2020

Modern Academy

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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: August 2020

B - Basic Information

Title: Advanced Calculus **Code:** MTHn104 **Level:** 1st

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

Pre-requisite: MTHn001

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge, skills, and attitudes) related to 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 triple integrals to integrate the function of several variables in different coordinates.

2 – Competencies

- c1- Identify applications of partial derivatives to physical and Engineering problems. (C1, C5)
- c2- Explain rule of double integral. (C1, C5)
- c3- Identify rule of triple integral. (C1, C5)
- c4- Explain basic concepts of cylindrical coordinates. (C1, C5)
- c5- Explain basic concepts of spherical coordinates. (C1, C5)
- c6- Uses of vector calculus analysis in applications. (C1)
- c7- Apply applications of partial derivatives to Engineering problems. (C1, C9)
- c8- Choose the right decision by choosing the best kind of multiple Integration in applications. (C1, C9, C10)
- c9- Use vector analysis to evaluate line integrals and surface integrals for a vector function. (C1, C9)
- c10- Apply multiple Integration in electronics. (C7, C9)
- c11- Apply vector analysis to find the work done by the force field in electrical problem. (C7, C9)
- c12- Communicate effectively. (C8)
- c13- Search for information. (C9, C10)

This course contributes in the following program competencies: **C1, C5, C7, C8, C9 & C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	• Functions of several variables	2	3	—
2	• partial derivatives	3	4	—
3	• Directional derivatives	2	3	—
4	• Taylor polynomials	2	3	—
5	• Lagrange multiplier max, and min. of functions	3	4	—
	➤ Multiple integrals (double, triple integrals)			
6	• Double integrals	4	6	—
7	• Mid term	2	3	
8,9	• Triple integrals	4	6	—
	➤ Polar coordinates, cylindrical coordinates and spherical coordinates			
10	• Polar coordinates, cylindrical coordinates	2	3	—
11	• spherical coordinates	2	3	—
	➤ Green's theorem, Gauss's and Stocks theorems.			
12,13	• Vector Calculus	3	6	—
14,15	• Green's theorem, Gauss's and Stocks theorems.	1	1	—
Total hours		30	45	—

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies												
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13
Functions of several variables	1												1
Partial derivatives	1						1						1
Directional derivatives	1						1						1
Taylor polynomials	1						1						1
Lagrange multiplier max, and min. of functions	1						1					1	1
Double integrals		1				1		1		1	1	1	1
Triple integrals			1			1		1		1	1	1	1
Polar coordinates, cylindrical coordinates				1		1		1		1	1	1	1
Spherical coordinates					1	1		1		1	1	1	1
Vector Calculus		1				1			1		1		1
Green's theorem, Gauss's and Stocks theorems.		1	1	1	1	1			1		1	1	1
Topics Covering Competences	5	3	2	2	2	6	4	4	2	4	6	6	11

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
c1	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
c5	1		1	1		1	1	1
c6	1	1	1	1		1	1	1
c7	1	1		1		1	1	1
c8	1	1	1	1		1	1	1
c9	1	1	1	1	1	1	1	1
c10	1	1			1			
c11	1	1			1			
c12		1	1		1			1
c13	1			1	1			1
Σ	12	10	9	10	8	8	8	11

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

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

7-2 Required books:

Friedman, A. (2009) Advanced Calculus. Dover Publications

7-13 Recommended books:

Kreyszig, E. (2010) Advanced Engineering Mathematics. John Wiley, New York.

7-4 Periodicals, Web sites, etc.

www.mathwords.com.

www.khanacademy.org/math

www.sosmath.com

8- Facilities required for teaching and learning:

- Library.
- High speed internet and communication facilities for distance learning

Course coordinator: Associat Professor / Ashraf Taha EL-Sayed

Head of the Department: Associat Professor / Ashraf Taha EL-Sayed

Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn115: Semiconductors for Microelectronics

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Basic Science Department
Date of specifications approval:	August 2020

B - Basic Information

Title: Semiconductors for Microelectronics	Code: ELCn115	Level: 1 st Spring
Credit Hours: 2	Lectures: 1	Tutorial/Exercise: 2
	Pre-requisite: ELCn114	Practical: 1

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, principles of semiconductor materials. Also the operation of and applications of PN junction (diode). They must study the characteristics (forward and reverse bias) of rectifier diode and tunnel diodes, Ohmic contact, heterojunction, bipolar junction transistor (BJT), junction field effect transistor (JFET), metal oxide semiconductor transistor (MOSFET). They have to study physical structure, basic configuration, I-V characteristic and applications of semiconductors.

2 – Competencies

- c1- Explain the theoretical background of semiconductor materials. (C1, C14)
- c2- Study crystal structure and band structure of semiconductors. (C1, C14)
- c3 - Classify and compare the difference between intrinsic and doped semiconductor and carrier transport. (C2, C14)
- c4 - Deduce mathematical relations describing the conductivity of intrinsic and extrinsic semiconductors. (C1, C2)
- c5 - Analyze, the structures, characteristics, principles of operation and applications of PN junction. (C1, C14)
- c6 - Use experimental facilities to explain the characteristics (forward and reverse bias) of diodes. (C13, C14)
- c7- Apply the theoretical background and experimental tools to understand operation of transistor. (C1, C2)
- c8 - Use experimental facilities to design, operate test, and maintain different types of diodes. (C3, C4, C14)
- c9 - Work in a team and involve in group discussion and seminars. (C2, C3, C7)
- c10 - Design amplifiers and transformers. (C5, C10)
- c11 - Communicate effectively and present data and results orally and in written form. (C5, C8, C14)
- c12 - Search for information's in references and in internet. (C5, C9)
- c13 - Use ICT facilities in presentations. (C8, C9, C14)
- c14 - Practice self-learning and communicate effectively orally and in written form. (C7, C8)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13 & C14.**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Introduction to semiconductors <ul style="list-style-type: none"> Classify different types of semiconductors Crystal structure and band structure of semiconductor 	2	2	2
2	<ul style="list-style-type: none"> Conduction in different types of semiconductor <ul style="list-style-type: none"> P-N junction 	2	2	2
3	<ul style="list-style-type: none"> Forward bias Reverse bias and breakdown <ul style="list-style-type: none"> Diodes 	2	1	2
4	<ul style="list-style-type: none"> Rectifier diode 	2	1	2
5	<ul style="list-style-type: none"> Zener diode 	2	1	2
6	<ul style="list-style-type: none"> Solar cell 	2	1	2
7	Midterm exam	2		
8	<ul style="list-style-type: none"> Tunnel diode 	2	1	
9	<ul style="list-style-type: none"> Transistors 	2		
10	<ul style="list-style-type: none"> Bipolar junction transistor (BJT) 	2	1	2
11	<ul style="list-style-type: none"> Junction field effect transistor (JFET) 	2	1	2
12,13	<ul style="list-style-type: none"> Metal oxide semiconductor transistor (MOSFET) 	4	2	2
14,15	<ul style="list-style-type: none"> Physical structure, basic configuration and I-V characteristics and some semiconductor applications 	4	2	2
Total hours		30	15	20

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	c8	C9	c10	c11	c12	c13	c14
Introduction to semiconductors	1	1		1						1	1	1		1
Classify different types of semiconductors	1	1	1	1						1	1	1		1
Crystal structure and band structure of semiconductor	1	1	1	1						1	1	1		1
Conduction in different types of semiconductor	1	1	1	1						1	1	1		1
P-N junction	1	1	1	1	1	1		1	1	1	1	1	1	1
Forward and reverse bias and breakdown	1	1	1		1	1	1	1	1	1	1	1	1	1
Rectifier diode	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Zener diode	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tunnel diode	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Solar cell	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Application of diodes	1	1	1		1	1	1		1	1	1	1	1	1
Schottky diode	1	1	1		1	1	1		1	1	1	1	1	1
Tunnel diode	1	1	1		1	1	1		1	1	1	1	1	1
Transistor	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bipolar junction transistor (BJT)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Junction field effect transistor (JFET)	1	1	1		1	1	1	1	1	1	1	1	1	1

Metal oxide semiconductor transistor (MOSFT)	1	1	1		1	1	1	1	1	1	1	1	1	1
Physical structure, basic configuration and I-V characteristics	1	1	1		1	1	1	1	1	1	1	1	1	1
Topics Covering Competences	18	18	17	11	14	14	13	11	14	18	18	18	14	18

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
c1	1	1	1	1	1	1	1	1
c2	1	1	1	1	1	1	1	1
c3	1	1	1	1	1	1	1	1
c4	1	1	1	1	1	1	1	1
c5	1	1	1	1	1	1	1	1
c6	1	1	1	1	1	1	1	1
c7	1	1	1	1	1	1	1	1
c8	1	1	1	1	1	1	1	1
c9	1	1	1	1	1	1	1	1
c10	1	1	1	1	1	1	1	1
c11	1	1	1	1	1	1	1	1
c12	1	1	1		1			
c13	1	1	1		1			
c14	1	1	1		1			
Σ	14	14	14	111	14	11	11	11

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	20
	Reports/Research		
	Assignments		
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-4 Course notes:

A. H. Serag, S. A. Eladly (2020), Semiconductors for Microelectronics, Lectures notes, Modern Academy.

7-2 Required books:

Sze, S. (2012) Semiconductor Devices Physics & Technology, USA: John Wiley & Sons.

Joachim Piprek (2013) Semiconductor Optoelectronic Devices, India: Academic Press.

7-14 Recommended books:

Jaspri 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.

7-4 Periodicals, Web sites, etc.

[www. Physics.exchange.com](http://www.Physics.exchange.com)

www.iop.org.com

8- Facilities required for teaching and learning:

- Semiconductors Lab.
- Library.
- Internet.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Abeer Serag E'-Deen

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn160: Summer Training-2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program.
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: August, 2020

B - Basic information

Title: Summer training-2
Credit Hours: 0

Code: ELCn160 **Year/level:** Senior 2, Second Summer
Lectures: 2 **Tutorial:** none **Practical:** 10 Days
Pre-requisite: ELCn 060

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to the parts of the training which are:

- 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 – Competencies

- c1. Understand the PCB design process and the principle operation of embedded system specially Arduino Uno (C3,C8)
- c2. Understand the characteristic of Printed circuit board kite (C3,C4).
- c3. Introduce basic function of Eagle program and the main concept of application system using arduino (C4,C8).
- c4. Explain required programming skills with C programming (C6, C9)
- c5. Design and implement the Dc power supply circuit (C10, C13)
- c6. Implement discrete active devices (self biased grounded emitter NPN transistor) (C13,C14)
- c7. Implement different project using Arduino: (C14,C15)
- c8. Provide a step-by-step introduction to the EAGLE PCB-Design Package by way of a different examples (C13 C14,)
- c9. Search for information and engage in life-long self-learning discipline (C5,C10)
- c10.. Collaborate effectively within multidisciplinary team (C5,C10)
- c11. Practice self-learning and communicate effectively orally and in written form(C10,C15)

This course contributes in the following program competencies: **C3, C4, C5, C6, C7, C8, C9, C10, C13, C14 & C15**

3- Contents:

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

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies										
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11
1- Implement discrete active devices.	1	1									
2- Design and implement the Dc power supply circuit	1						1	1			1
3- Introduction to the EAGLE PCB-Design Package.			1	1		1		1		1	
4- Printed the Dc power supply circuit using FR-4 board.			1	1	1	1		1	1	1	
5- - Explain required programming skills with C programming		1			1			1	1	1	
6- Introduce a flexible programmable hardware platform Arduino Uno		1						1	1		
7- Implement different project using Arduino											
Topics Covering Competencies	2	3	2	2	2	2	1	5	3	3	1

5 - Teaching and Learning and Assessment methods:

Course Comnetences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assnments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizes	Research & Presentations	Mini Project Report
c1	1	1	1			1		1							
c2	1	1				1		1							
c3	1	1				1									
c4	1	1				1									
c5	1	1	1			1		1							
c6	1	1			1	1			1						
c7	1	1				1									
c8	1	1	1			1	1								
c9	1	1				1	1	1	1						
c10	1	1			1	1									
c11	1	1				1		1							
Σ	7	7	3	-	2	7	2	5	2						

6- Assessment Timing and Grading:

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

7- List of references:

7-2 Course notes:

Summer Training Level 1 “Theoretical part”

7-2 Required books

- 1- Wawirk. A. Smith, “ Arduino Uno hardware manual” , Createspace Independent Publishing Platform, 2019.
- 2- Mark I. Montrose “ Printed Circuit board Design Techniques for EMC”, IEEE press series of electronic, 2015

7-3 Recommended books: None

William. Hayat “ Engineering Circuit analysis”, Wiley, 2009.

7-4 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:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification GENn341a: Project Management

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: August, 2020

B - Basic Information

Title: Electronic Measurements

Code: GENn341a

Level: 2nd Fall

Credit Hours: 2

Lectures: 2

Tutorial/Exercise: - Practical: -

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to provide the students the relevant competences (knowledge, skills, and attitudes) needed to understand and apply the basic principles required for the project control, while considering its different goals and constraints. It also enables 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- Competencies

- c1. Identify, classify, and explain the project constraints, and the project management phases. (C1, C2)
- c2. Identify, classify, and define the body of Knowledge required for the project manager, and his/her specified role and skills. (C1, C2)
- c3. Define and explain the project planning levels, steps, and the rules for effective planning. (C1, C2)
- c4. Practice formulating and developing the project's vision, mission, and objectives (C1, C5)
- c5. Apply work breakdown structure (WBS) to identify the project activities (tasks), and to evaluate their cost and duration. (C3)
- c6. Explain how the critical-path method (CPM) identifies the project's critical tasks, critical path, and the float available for non-critical tasks. (C3)
- c7. Apply heuristic optimization technique to produce a visible schedule of the project's tasks that satisfy both time and resources (cost) constraints (C4, C6)
- c8. Explain how project progress review monitors and compares project progress against project plan. (C4, C6)
- c9. Apply earned-value analysis (EVA) to identify, analyze the project progress status, and to estimate the future work. (C4, C6)
- c10. Define and clarify the main procedures for project team management through team selection, building, and developing (C7, C9)
- c11. Define and clarify the main procedures for project quality management through quality criteria, processes, assurance, and control (C1, C2)
- c12. Define and clarify the main procedures for project risk management through risk identification, analysis, evaluation, and developing ways to respond to negative/ positive risk by reducing/promoting its effect (C1, C9).
- c13. Practice self-learning and communicate effectively orally and in written form (C8, C10)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10.**

3-Contents

Week	Course Topics	Lecture hours	Tutorial hours	Practical hours
1	Overview of the Project Management: Project Constraints Project Management phases	2	-	-
2	Body of Knowledge required for the project manager. Roll and Skills of the project manager	2	-	-
3	Planning the Project: Planning Levels, Rules and Steps Developing the Project's Vision, Mission, and Objectives	2	-	-
4	Work Breakdown Structure (WBS) Critical-Path Method	2	-	-
15	Time-Constrained Schedule	4	-	-
6	Time and Recourse-Constrained Schedule	2	-	-
7	Assessment (Mid- Term)	-	-	-
8	Controlling the Project: Project Progress Review	2	-	-
9	Earned-Value Analysis	4	-	-
10	Managing the Project Team Project Team Selection, Building, and Developing.	2	-	-
11	Quality Management Quality Criteria, Processes, Assurance, and Control.	2	-	-
12	Risk Management Risk Identification, Analysis, Evaluation, and Responding. (Report)	3	-	-
13	Revision	1	-	-
14	Revision	1	-	-
15	Revision	1	-	-
Total hours		30	-	-

4. Course content/Course Competencies mapping matrix.

Course Topics	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	
1. Project Constraints	1													
2. Project Management phases	1													
3. Body of Knowledge required for the project manager.		1												
4. Roll and Skills of the project manager		1												
5. Planning Levels, Rules and Steps			1											
6. Developing the Project's Vision, Mission, and Objectives				1										
7. Work Breakdown Structure (WBS)					1									
8. Critical-Path Method						1								
9. Time-Constrained Schedule							1							
10. Time and Recourse-Constrained Schedule							1							
11. Project Progress Review								1						
12. Earned-Value Analysis									1					
13. Project Team Selection, Building, and Developing.										1				
14. Quality Criteria, Processes, Assurance, and Control.											1			
15. Risk Identification, Analysis, Evaluation, and Responding. (Report)												1	1	
Topics Covering Competencies	2	2	1	1	1	1	2	1	1	1	1	1	1	

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods					Learning Methods			Assessment Method					
	Lecture	Tutorials	Problem solving	Laboratory & Experiments	Discussions & seminars	Self - Learning	Research & Report	Assignments	Written Exam	Practical Exam	Quizzes	Assignments	Research & Report	Mini - Project
c1	1							1	1			1		
c2	1							1	1			1		
c3	1							1	1			1		
c4	1				1					1				
c5	1				1				1					
c6	1		1						1		1			
c7	1		1					1	1			1		
c8	1		1						1		1			
c9	1		1					1	1			1		
c10	1				1				1		1			

c11	1							1	1			1		
c12	1								1		1			
c13	1					1	1						1	
Σ	13	-	4	-	3	1	1	6	11	-	4	6	3	-

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Assignments	2 assignments per semester	20
	Quizzes	2 quizzes per semester	20
	Reports	1 report per semester	5 (Bonus)
Mid-Term Exam		7 th Week	20
Practical Exam		-	-
Written Exam		16 th week	40
Total			100

7- List of references:

7-1 Course notes: Lectures notes

7-2 Required books:

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

7-3 Recommended books:

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

7-4 Periodicals, Web sites, etc. (Last accessed January 2021)

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

8- Facilities required for teaching and learning:

- Computer, and Data show

Course coordinator:

Dr. Fawzy Hashim

Head of the Department:

Prof. Dr. Shouman S.E.I.

Date:

August, 2020

Course Specification

ELCn210:Control- I (Principles of Automatic Control)

A- Affiliation

Relevant program:	Electronic Engineering & Communication Technology BSc Program
Department offering the program:	Electronic Engineering & Communication Technology Department
Department offering the course:	Electronic Engineering & Communication Technology Department
Date of specifications approval:	August, 2020

B - Basic information

Title: Control – I	Code:ELCn210	Level: 2 nd Fall	
Credit Hours: 3	Lectures:3	Tutorial:0	Practical:1
	Pre-requisite: MTHn103		

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to enable the students 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 domain using the classical control theory tools .

2 – Competencies

- c1- Classify and identify different types of control systems (C1).
- c2- Construct ; test ; and investigate performance characteristics of open and closed loop systems (C2 ; C18).
- c3- Acquire knowledge and background to develop and solve the mathematical model of physical systems (C1 ; C5 ; C10).
- c4- Investigate the concept of transfer function model of linear system ; and algebra of block diagrams (C1 ; C11 ; C14).
- c5- Calculate the transient parameters of system response and steady- state errors at system output (C1 ; C14).
- c6- Investigate the stability of F.B. control systems (C1 ; C2 ; C14).
- c7- Use the experimental facilities to investigate the control system performance systems (C2 ; C18).
- c8- Design of proper controller (P; PI ; PID) to achieve certain performance of a given control system (C3 ; C12 ; C13 ; C17).
- c9- Construct and use the root locus plot for analysis and design of control system (C3 ; C12 ; C13 ; C17).
- c10- Deduce the frequency response plots of control systems and investigate different types of compensators (C1 ; C10 ; C12).

This course contributes in the following program competencies : **C1; C2 ; C3 ; C5 ; C10 ; C11 ; C12 ; C13 ; C14 ; C17 &**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Introduction to control system (closed loop versus open loop control).	2	-	2
2	➤ Mathematical background for solving of linear time-invariant systems (differential equations & Laplace transform).	3	-	-
3	➤ Transfer function of system, block algebra & Mason's gain formula.	4	-	-
4	➤ Models for examples of physical systems (electrical ; mechanical ; aero-space).	4	-	-
5	➤ Closed loop system subjected to disturbances & errors of system.	2	-	4
6	➤ State-space representation of dynamic system & state transition matrix.	4	-	-
7	➤ Assessment (Mid- Term)	-	-	-
8	➤ First order & second order open and closed loop responses.	3	-	4
9	➤ Effect of roots of the system characteristic equation (poles of system) on the system transient response parameters.	2	-	-
10	➤ Static error coefficients (K_p ; K_v ; K_a).	2	-	-
11	➤ Stability of linear control system (Routh-Hurwitz criterion).	3	-	-
12	➤ Basic control actions (P; PI; PD; PID) controllers.	3	-	4
13	➤ Root locus plots concept and system analysis.	3	-	-
14	➤ Frequency domain analysis and Bode diagrams.	4	-	-
15	➤ The concept of stability in the frequency domain (polar diagram & Nyquist criterion).	3	-	-
Total hours		45	-	15

4. Course content/Course Competencies mapping matrix:

Topic	Course Competencies									
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10
Introduction to control system (closed loop versus open loop control).	1	1	1	1						
Mathematical background for solving of linear time-invariant systems (differential equations & Laplace transform).		1	1	1						
Transfer function of system; block algebra; Mason's gain formula.			1	1						
Models for examples of physical systems (electrical; mechanical; aero-space).		1	1	1						
Closed loop system subjected to disturbances & errors of			1	1	1					

system.															
State-space representation of dynamic system & state transition matrix.		1	1	1											
First order & second order open and closed loop responses.	1	1	1	1	1										
.Effect of roots of the system characteristic equation (poles of system) on the system transient response parameters .		1		1	1		1								
Static error coefficients (K_p ; K_v ; K_a).	1	1	1	1	1	1		1	1						
Stability of linear control system (Routh – Hurwitz criterion).		1	1	1			1		1						
Basic control action (P ; PI ; PD ; PID) controllers.		1	1	1	1	1	1	1	1	1					
Root-Locus plots concept and system analysis.				1			1		1		1	1			
Frequency domain analysis and Bode diagrams.			1	1							1			1	
The concept of stability in frequency domain (polar diagram ; Nyquist criterion).		1		1			1				1			1	
Topics Covering Competencies	3	10	11	14	5	4	3	6	1	2					

5 - Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods				Assessment Method				
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1		1		1		1		1			
c2	1				1	1				1		1			
c3	1				1	1				1		1	1		
c4	1			1	1	1			1	1		1			
c5	1				1	1	1		1	1		1	1		
c6	1			1	1					1					
c7						1			1			1	1		
c8	1			1	1	1	1		1	1		1			
c9	1				1		1	1		1			1		
c10	1			1	1		1			1					
Σ	9			5	8	7	4	2	4	9		7	4		

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes& Reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes: Lecture notes and handouts

7-2 Required book :

K. Ogata, "Modern Control Engineering", Prentice-Hall ,INC, 2010.

7-3 Recommended books:

B.C. Kuo, "Automatic Control System", John Wiley& Sons, 2003.

R. Dorf, R. Bishop, "Modern Control Systems", A. Wesley, 1995.

7-4 Periodicals, Web sites, etc.

8- Facilities required for teaching and learning:

- Automatic control Lab.
- Lectures
- High speed internet and communication facilities for distance learning.

Course coordinator: Ass.Prof. Dr. Magdy O. Tantawy

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

Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn212: Microelectronic 1

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Electronic Engineering and Communication Technology Department
Date of specifications approval:	August, 2020

B - Basic Information

Title: Microelectronic 1	Code: ELCn212	Level: 2 nd Fall	
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 1	Practical: 2
	Pre-requisite: ELCn114		

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to

- They should compete on the design, calculate, operate, maintain and analyze the performance of electronic circuit and their basic components.
- The construction and operation of semiconductor elements, basic electronic element, and operation of electronic circuit.

2 - Competencies

- c1. Identify the behavior of operational amplifier. (C1,C7)
- c2. Deduced mathematical equation of operational amplifier. (C1,C7).
- c3. Explain the theoretical background needed to calculate and analyze the characteristics of the operational amplifier and their manufacturing. (C2,C3,C12).
- c4. . Explain and design a different Op-Amp application. (C3,C7,C12)
- c5. Deduced mathematical the equation of Op-Amp application. (C3, C12)
- c6. Introduce the basic structure of semiconductor element. (C1, C3).
- C7. Explain the Dc characteristic and different model of diode element.(C2,C5)
- C8. Explain and design different types of rectifier circuit, power supply, and voltage regulator. (C3,C5, C12)
- C9. Deduced mathematical the ripple factor of Dc power supply circuit. (C1, C3, C12)
- c10. Explain the construction of different semiconductor elements like Bipolar junction transistor (BJT) and Junction Field effect Transistor (JFET). (C1, C2,C10).
- c11. Explain different types of DC biasing circuit in BJT , JFET. (C2,C3)
- c12. Analyze the small signal model of JFET. (C2, C3,C10)
- c13. Explain the construction and characteristics of MOsFET. (C1, C3, C10,C12)
- c14. Use computer software; Spice, multisim and other available programs to design, calculate, and simulate simconductor circuit.
- c15. Use experimental facilities to visualize and investigate the different electronic circuit and evaluate the characteristics of different semiconductor element. (C2).
- c16. Collaborate effectively within multidisciplinary team (C5,C7, C9).
- c17. Practice self-learning and communicate effectively orally and in written form (C8,C10).

This course contributes in the following program competencies:**C1, C2, C3, C5, C7, C8, C9, C10, & C12**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Introduce basic definition of operational amplifier	2	1	2
	Deduced mathematical equation of operational amplifier.			
2	analyze the characteristics of the operational amplifier and their manufacturaing	2	1	2
3	Operation of different Comparator circuit. Operation of summing amplifier, integrator, Differentiator.	2	1	2
4	Construction, analyze the I-V characteristic curve of Diode.	2	1	
5	Explain half wave rectifier circuit. Explain full wave rectifier circuit.	2	1	2
6	Explain the following application circuit diode limiter , clippind and clamping circuit.s	2	1	2
7	Assessment (Mid-Term)	-	-	-
8	Design of power supply circuit	2	1	2
	Construction of Bipolar Junction Transistor (BJT).			
9	Dc biasing circuit of BJT	2	1	2
10	Construction of Junction Field effect Transistor (JFET)	2	1	2
11	Dc biasing circuit of (JFET)	2	1	2
12	Small signal model of JFET	2	1	2
13	Voltage Biasing configuration	2	1	2
14	JFET Source-Follower (Common-Drain) Configuration	2	1	2
15	Enhancement-Type MOSFET Discuss miniproject & revision	4	2	4
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
Introduce basic definition of operational amplifier.	1	1	1														
Deduced mathematical equation of operational amplifier.	1	1	1														1
analyze the characteristics of the operational amplifier and their manufacturaing	1	1	1											1	1		
Operation of different Comparator circuit.				1	1									1	1		
Operation of summing amplifier, integrator, differentiator.				1	1									1	1		1
Construction, analyze the I-V characteristic curve of Diode.						1	1			1				1	1		1

Explain half wave rectifier circuit.								1	1					1	1		1
Explain full wave rectifier circuit.								1	1					1	1		
Design of power supply circuit								1	1		1			1	1		1
Construction of Bipolar Junction Transistor (BJT) & Junction Field effect transistor (JFET).							1				1					1	
Dc biasing circuit of BJT							1				1	1			1		
Dc biasing circuit of (JFET)							1					1		1			
Small signal model of JFET												1		1		1	
Voltage Biasing configuration												1		1			
JFET Source-Follower (Common-Drain) Configuration												1		1			
Enhancement-Type MOSFET							1				1				1	1	1
Mini project					1		1	1	1					1	1	1	1
Topics Covering Competences	3	3	3	2	3	3	4	4	4	4	2	5	4	12	10	4	7

5 - Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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		
c5	1		1	1				1		1	1	1	1		
c6	1			1	1	1				1	1		1		
c7	1	1		1		1				1	1	1	1		
c8	1	1		1		1	1		1	1	1	1	1	1	1
c9	1	1		1			1	1	1	1	1		1	1	1
c10	1	1		1	1					1	1	1	1		
c11	1	1		1		1				1	1		1		
c12	1	1	1	1	1	1	1			1	1	1			1
c13	1	1		1	1	1		1						1	
c14					1	1									
c15						1									
c16	1														
c17											1	1			
∑	14	9	2	12	5	11	3	4	2	12	11	9	8	3	3

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	1 Quizzes	5
	Tutorials	2 Assignments per semester	10
	Mini project	Once per semester	5
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

1- Microelectronics Circuits-1 "Theoretical part"

2- Microelectronics Circuits-1 "Practical part"

7-2 Required books

Sedra-Smith,(1998), **Microelectronics Circuits**, Oxford University Press,

7-5 Recommended books:

Malvino. A., Bates D., (2016) **Electronic Principles**, Macmillan Mc Graw Hill Inc, ISBN - 978-0-07-337388-1.

7-4 Periodicals, Web sites, etc.

<https://www.allaboutcircuits.com/textbook/semiconductors/chpt-3/rectifier-circuits/>, (Last accessed February, 2021)

<https://www.electronics-tutorials.ws/amplifier/transistor-biasing.html>, (Last accessed February, 2021)

<https://resources.system-analysis.cadence.com/blog/msa2020-realizing-the-small-signal-model-using-jfet-parameters-for-circuit-behavioral-studies>, (Last accessed February, 2021)

- Youtube

Microelectronic lab: <https://www.youtube.com/watch?v=dGtcqjCWx-w>

8- Facilities required for teaching and learning:

- Microelectronic Lab.
- Lecture and Exercise rooms equipped with a projector and sound systems.
- Computer, Data show and Computer programs; pspice, multisim.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Sara Fouad

Head of the Department:

Prof. Dr. Shouman S.E.I.

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

CMPn210: Engineering Computer Applications.

A- Affiliation

Relevant program:	Computer Engineering and Information Technology BSc Program Electronic Engineering and Communication Technology BSc Program
Department offering the program:	Computer Engineering and Information Technology Department Electronic Engineering and Communication Technology Department
Department offering the course:	Computer Engineering and Information Technology Department
Date of specifications approval:	August 2020

B - Basic Information

Title: Engineering Computer Applications **Code:** CMPn210 **Level:** 2rd , 3rd Fall, spring

Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: CMPn010

C - Professional information

1 – Course Learning Objectives:

MATLAB is a high-level language and interactive environment that enables you to perform computationally intensive tasks and computer applications faster than with traditional programming languages such as C, C++, and Fortran. By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to the construction and operation of MATLAB software package and its different toolbox. The students should compete on handling and utilizing the different features, concepts and operations of such package in many applications. Moreover, Guided with this interactive environments software package the students should be able to handle, develop and enhance modules and programs in many applications. Different scientific applications will be demonstrated and solved including: - basic science problems (math, and physics), electrical/electronic circuit analysis, and some digital control applications.

2 - Competencies

- c1. Identify the different features, basic operations, and different items of MATLAB desktop environments.(C1,C5)
- c2. Explain, formulate, and solve complex engineering problems utilizing High-level language for technical computations (Mathematical, logical, Array Operations, Vectors and Matrix Operations in MATLAB) (C1,C3)
- c3. Utilize contemporary technologies, codes of practice and standards to develop environment for managing code, files, and data (MATLAB programming features via script M-files, function files, and Simulink models)) (C2,C4)
- c4. Communicate effectively – graphically, in writing suitable code using contemporary tools (handling MATLAB plotting and Graphing capabilities, 2-D and 3-D graphics functions for visualizing data) (C8)
- c5. Investigate on a MATLAB program in similar way to other computer programming, to build specific functions for integrating MATLAB based algorithms with external applications and languages (such as C++, Fortran, and Microsoft Excel) (C3)
- c6. Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools (MATLAB applications in the field of circuit theory including DC analysis, transient analysis, AC Analysis and network functions of an electrical circuit). (C11)
- c7. Manipulate SIMULINK models to estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application (C12, C13)
- c8. Use a wide range of analytical tools, techniques, and software packages pertaining to the discipline and develop required computer programs to solve mathematical functions for linear algebra, statistics, Fourier analysis, filtering, optimization, and numerical integration (C17)
- c9. Investigate on a mini project for Innovating solutions based on non-traditional thinking and the use of latest technologies to investigate a physical problems, deduce its mathematical model, then perform the MATLAB program to solve (C20).

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C8, C11, C12, C13, C17& C20**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Introduction to MATLAB, Mat lab Fundamentals, and basic features	1	1	2
2	Data types, variables, Matrix Operations, Array Operations Vectors and data analysis	2	1	2
3	Handling different plotting Commands, logarithmic plots. Adding plots to an existing graph, controlling the axes	3	2	3
4	Control Statements M – script files, and function files	2	2	2
5	Data and file handling including input/output/saving data files	2	2	2
6	Handling audio and video files. How to use symbols in mat lab including The symbolic variables	2		2
7	Assessment (mid-term exam)	2	1	2
8	Utilizing MATLAB in the field of electric and electronic circuits Applications including DC /AC circuits	2	1	2
9	transient Analysis Applications using mat lab	2		2
10	Frequency response analysis using mat lab	2		2
11	Computer Application using MATLAB-Mathematical Models of different systems	2	1	4
12	Advanced Programming in MATLAB in Special topics investigations including:- Fourier analysis, Semiconductor physics, Operational Amplifier	2	1	
13	Introduction to Simulink	2	1	2
14	Developing Simulink models for different digital and control systems	2	1	2
15	Mini project seminar analysis and design utilizing overall concepts of MATLAB capabilities	2	1	2
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	c1	c2	c3	c4	c5	c6	c7	c8	c9
Introduction to MATLAB, Mat lab Fundamentals, and basic features	1							1	1
Data types, variables, Matrix Operations, Array Operations Vectors and data analysis	1	1							
Handling different plotting Commands, logarithmic plot. Adding plots to an existing graph, controlling the axis	1			1					1
Control Statements M – script files, and function files			1		1	1			1
DATA and FILES handling including Import/Saving data files , Accessing different file types (audio/video files) How to use symbols in mat lab		1	1		1				1
Utilizing MATLAB in the field of electric and electronics circuits Applications including DC and AC circuit Analysis Applications		1	1			1			1
Computer Application using MATLAB-Mathematical Models of different systems		1	1				1		
Advanced Programming in MATLAB in Special topics investigations including :- Fourier analysis, Semiconductor physics, Operational Amplifier		1	1		1				
Introduction to Simulink	1		1			1	1		
Developing Simulink models for different digital and control systems			1			1	1	1	1
Mini project seminar analysis and design utilizing overall concepts of MATLAB capabilities	1	1	1	1	1	1	1	1	1
Topics Covering Competencies	5	6	8	2	4	5	4	3	7

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches, Reports & Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report	
c1	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
c4	1	1		1		1		1		1	1	1			1
c5	1	1		1	1	1	1	1		1	1	1	1	1	1
c6	1	1	1	1	1	1				1	1	1	1		1
c7	1	1	1	1		1	1	1	1	1	1	1	1	1	1
c8	1	1	1	1		1	1	1	1	1	1	1		1	1
c9	1	1	1		1		1	1	1					1	1
Σ	9	9	4	8	5	8	4	6	3	8	8	8	5	4	9

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)	
Mid-Term Exam	7 th Week	20	
Practical exam	12 th Week	20	
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	3
	Mini project	Once per semester	7
Written Exam	Sixteenth week	40	
Total		100	

7- List of references:

7-1 Course notes:

- Lecture notes and handouts
- Abd elmoneim fouda, **Engineering Computer Applications**. Cairo :MAM Press
- Laboratory work printed notes
- Abd elmoneim fouda, **Engineering Computer Applications**. Practical part.Cairo :MAM Press

7-2 Required books

- 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

7-3 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,.

7-4 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/> .

8- Facilities required for teaching and learning:

- Computer Lab. equipped with Data show and Computer package
- Lecture and Exercise rooms equipped with Data show projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Abd Elmoneim FoudA
Head of the Department: Dr. Abd Elmoneim FoudA
Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

MTHn107: Mathematics -7(Introduction to Probability and Statistics)

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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course: Basic Science Department

Date of specifications approval: August 2020

B - Basic Information

Title: Mathematics-7(Introduction to Probability and Statistics) **Code:** MTHn107 **Level:** (1st Spring) and (2nd Fall & Spring)

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

Pre-requisite: MTHn002

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge, skills, and attitudes) related 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 – Competencies

- c1- Develop the main rules and notions of functions and set theory. (C1, C5)
- c2- List the basics and different rules of probability theory. (C1, C2, C5)
- c3- Apply discrete and continuous probability distributions and rules of their expectation and their standard deviation (C1, C2, C5).
- c4- Explain main notions of descriptive statistics, probability concepts, binomial, and normal distributions, as well as the notions of conditional probability and counting techniques. (C1, C2, C5)
- c5- Investigate many principles of sampling and the central limit theorem, estimation, and regression. (C1, C2, C5)
- c6- Explain basic concepts of statistics, measures of location and measures dispersion. (C1, C2)
- c7- Describe discrete data graphically and compute measures of centrality and dispersion. (C1, C2)
- c8- Compute probabilities by applying different probability rules and theorems of probability. (C1, C2, C9)
- c9- Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance. (C1, C2, C9)
- c10- Apply basic concepts of probability functions, Mathematical expectation, variables, discrete distribution, binomial distribution, continuous distribution, and normal distribution to applications. (C1, C2)
- c11- Evaluate and analyze basic concepts of statistics, sampling, the central limit theorem, estimation, correlation, and regression. (C1, C2, C5, C9)
- c12- Apply probability and statistics methods to engineering problems (C1, C2, C5, C9)
- c13- Write technical reports and E-mails. (C7, C8).
- c14- Do related research on internet (C7, C9, C10).

This course contributes in the following program competencies: **C1, C2, C5, C7, C8, C9, C10**

3. Contents

Topic		Lecture hours	Tutorial hours	Practical hours
1	Functions, curve equation relationship, Set theory	2	2	
2	Experiments, Sample space, Random events, and Counting Techniques	2	2	
3	Basic Probability Rules	2	2	
4	Mathematical expectation, conditional probability, and independent events	2	2	
5	Random variables and Discrete Distributions	2	2	
6	Binomial distribution, Poisson distribution.	2	2	
7	MT Exam	2	2	
8	Continuous Distribution.	2	2	
9	Normal Distribution.	2	2	
10	Data types, population, sample, and Data presentation.	2	2	
11	Measures of central tendency (all types of data)	2	2	
12	Measures of deviation (all types of data)	2	2	
13	Sampling and the central limit theorem	2	2	
14	Estimation, hypothesis testing.	2	2	
15	Regression and correlation.	2	2	
Total hours		30	30	

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14
Functions, curve equation relationship.	1						1						1	
Set theory, Random events, and probability functions.	1							1	1	1		1	1	1
Mathematical expectation, conditional probability.		1	1	1				1	1	1		1	1	1
Binomial distribution, normal distribution.		1	1	1				1	1	1		1	1	1
Sampling and the central limit theorem.					1						1	1	1	1
Estimation, hypothesis testing.					1						1	1	1	1
Regression and correlation.					1						1	1	1	1
Chi-square analysis and analysis of variance.						1					1	1	1	1
Topics Covering Competences	2	2	2	2	3	1	1	3	3	3	4	7	8	7

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods		Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Modeling and Simulation	Written Exam	Quizes	Assignments
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	1	1
c5	1	1	1	1	1	1	1	1	1
c6	1	1	1	1	1	1	1	1	1
c7	1		1	1			1	1	1
c8	1				1	1	1		
c9	1	1		1	1		1		
c10	1		1	1	1		1	1	1
c11	1		1		1		1		
c12	1	1			1	1	1		
c13		1		1	1				1
c14	1	1	1	1	1				1
Σ	14	8	10	11	14	5	12	8	11

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

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

7-2 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

7-15 Recommended books:

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

7-4 Periodicals, Web sites, etc.

www.mathworlds.com, www.sosmath.com

8- Facilities required for teaching and learning:

- Library.
- High speed internet and communication facilities for distance learning

Course coordinator: Associate Prof. Sameh Shenawy
Head of the Department: Associat Professor / Ashraf Taha EL-Sayed
Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn211 Signal Analysis

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Electronic Engineering and Communication Technology Department
Date of specifications approval:	August 2020

B - Basic Information

Title: signal analysis	Code: ELCn211	Level: 2 nd Spring	
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 2	Practical: -
	Pre-requisite: MTH305		

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to the 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 - Competencies

- c1. Define and classify the electrical signal. (C1,C2)
- c2. Explain the basic operation in signal.(C1,C2).
- c3. Deduce the mathematical model of energy and power signal. (C1, C2, C8).
- c4. Classify and calculate the amount of energy and power for the signal. (C1, C8).
- c5. Define some useful function. (C1,C8)
- c6. Analyze, mathematically the signal representation in time and frequency domains. (C1,C2,C8)
- c7. Deduced mathematically the Fourier series analysis for periodic signal. (C1).
- c8. Analyze and sketch the amount of amplitude and phase spectrum of a periodic signal. (C2,C8,C17)
- c9. Deduce mathematical relations relation between the Fourier transform and Fourier series. (C1,C17)
- c10. Analyze the nonperiodic signal using Fourier transform to sketch the amplitude and phase spectrum. (C2,C17)
- c11. Deduce mathematically the properties of Fourier transform. (C1).
- c12. Explain and analyze the characteristics of linear time invariant system. (C1,C2, C5)
- c13. Defined the basics definition of probability, random variables and random process. (C2,C5).
- c14. Explain the probability density function.(C7).
- c15. Sketch signal waveform and spectrum for periodic function signals.using computer software program. (C2,C17).
- c16. Collaborate effectively within multidisciplinary team (C5,C7,C9).
- c17. Practice self-learning and communicate effectively orally and in written form.(C8,C10).

This course contributes in the following program competencies:**C1, C2, C5, C7, C8, C9, C10, & C17**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Definition and classify of electrical signal.	2	2	-
2	Deduce mathematically energy signal.	2	2	-
3	Deduce mathematically power signal.	2	2	-
4	Explain the signal operation (Time shifting , Time scaling, inversion)	2	2	-
	Defined useful function			
5	Explain Fourier series	2	2	-
6	Deduced the mathematical coefficient of Trigonometric Fourier series	2	2	-
7	Midterm exam	-	-	-
8	Deduced the mathematical coefficient of Compact Fourier series.	2	2	-
	Deduced the mathematical coefficient of Exponential Fourier series.			
9	Explain Fourier transform by definition.	2	2	-
10	Deduced mathematical form of Fourier transforms.	2	2	-
11	Properities of Fourier Transform.	2	2	-
12	6. Characteristics of linear time invariant system.	2	2	-
13	Convolution in time domain.	2	2	-
14	Defined random variables and random process	2	2	-
15	Probability density function, cumulative distribution function.	4	4	-
Total hours		30	30	-

4. Course content/Course Competencies mapping matrix:

Topic	Course Competences																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
Definition and classify of electrical signal	1																
Deduce mathematically energy signal.	1		1	1													
Deduce mathematically power signal.	1		1	1													
Explain the signal operation (Time shifting , Time scaling, inversion)		1			1												
Defined useful function		1			1				1								
Explain Fourier series	1					1	1	1									1
Deduced the mathematical coefficient of Trigonometric Fourier series	1					1	1	1									
Deduced the mathematical coefficient of Compact Fourier series.						1	1	1								1	
Deduced the mathematical coefficient of Exponential Fourier series.					1	1	1	1									
Explain Fourier transform by definition				1					1	1							
Deduced mathematical form of Fourier transforms					1				1	1					1	1	

Properties of Fourier Transform		1								1	1				1	1	1
Characteristics of linear time invariant system.											1	1	1			1	1
Convolution in time domain.											1	1	1				
Defined random variables and random process													1	1	1		1
Probability density function, cumulative distribution function.													1	1	1		1
Topics Covering Competences	5	3	2	3	4	4	4	4	3	5	2	4	2	2	3	5	4

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1	1	1	1											
c2	1	1		1							1			1	
c3	1			1						1	1				
c4	1	1		1						1					
c5	1	1		1				1		1	1				
c6	1	1		1	1					1			1		
c7	1	1		1	1					1	1		1		
c8	1			1	1		1			1	1			1	
c9	1		1	1			1	1		1				1	
c10	1			1	1					1	1		1	1	
c11	1	1		1	1		1			1			1		
c12	1	1		1	1					1	1		1		
c13	1	1		1						1					
c14	1	1	1	1	1			1		1	1				
c15			1				1	1	1					1	
c16								1	1						
c17								1	1						
Σ	14	10	3	14	7	-	4	6	3	12	8	-	5	5	-

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	2 Quizzes (one each 5 weeks)	10
	Reports/Research	one report per semester	10
	Tutorials	2 Assignments per semester	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: Signal Analysis (I) “*Theoretical part*”

7-2 Required books

- 1- Alan V. Oppenheim, Alan S. Willsky (1997) “Signal & systems” Prentice Hall.
- 2- William A. Gardner (1990) “Introduction to random process with application to signal & systems” Mc Graw Hill.

7-6 Recommended books: None

S. Haykin (2001), **Communication systems**, 4th edition J. W..

7-4 Periodicals, Web sites, etc.

- <https://ocw.snu.ac.kr/sites/default/files/NOTE/6783.pdf> ,(Last accessed January, 2021)
- http://www.southampton.ac.uk/~cjq/eng1/lecture_notes/01lfs.pdf ,(Last accessed January, 2021)
- http://www.ee.ic.ac.uk/hp/staff/dmb/courses/DSPDF/00400_Systems.pdf ,(Last accessed January, 2021)

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- Computer, Data show and Computer programs; Matlab.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Mohamed Elhawary
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: August 2020

Course Specification
ELCn214: Electronic Measurements

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Electronic Engineering and Communication Technology Department
Department offering the course:	Electronic Engineering and Communication Technology Department
Date of specifications approval:	August, 2020

B - Basic Information

Title: Electronic Measurements	Code: ELCn214	Level: 2 nd Fall	
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 1	Practical: 2
	Pre-requisite: ELCn113		

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to provide the students the relevant competences (knowledge, skills, and attitudes) needed to understand, handle, and develop conventional measuring instruments. They should compete on the theory and practice related to different methodologies and techniques for improving performance and accuracy of measuring instrumentations including voltmeters, ammeters, ohmmeters, frequency meters, oscilloscopes, spectrum analyzers, and data acquisition systems.

2 – Competencies

- c1. Classify and explain the advantage and disadvantage of the conventional electromechanical PMMC measuring devices. (C1, C2)
- c2. Utilize analog electronic circuits to improve the performance and accuracy of the conventional electromechanical PMMC measuring devices. (C4, C12)
- c3. Select and integrate digital electronic circuits to replace the PMMC-based analog electronic measuring devices. (C3, C13)
- c4. Explain the construction, operation, and specification of the basic parts of the analog CRT oscilloscope (C1, C2)
- c5. Select and integrate digital electronic circuits to provide additional functions and to improve the useability of the analog CRT oscilloscope. (C3, C13)
- c6. Demonstrate the performance of the analog and digital-storage CRT oscilloscopes of measuring and analyzing electrical signal waveforms in time domain. (C2, C14)
- c7. Explain the construction, operation, and specification of the basic parts of the analog spectrum analyzer (C1, C2)
- c8. Select and integrate digital electronic modules to provide additional functions and to improve useability of the analog spectrum analyzer. (C3, C13)
- c9. Demonstrate the performance the analog and digital spectrum analyzers of measuring and analyzing electrical signal waveforms in frequency domain. (C2, C14)
- c10. Explain the construction, operation, and specification of the basic parts of data acquisition systems (C1, C2)
- c11. Design and analyze the performance of analog-to-digital and digital -to- analog converters. (C3, C13)
- c12. Practice self-learning and communicate effectively orally and in written form (C8, C10)
- c13. Collaborate effectively within multidisciplinary team. (C7, C9)

This course contributes in the following programs competencies: **C1, C2, C3, C4, C7, C8, C9, C10, C12, C13 & C14**

3-Contents

Week	Course Topics	Lecture hours	Tutorial hours	Practical hours
1.	Analog Electronic Multi-meters: Emitter Follower Voltmeters classification, operation, and comparison	2	1	2
2.	Difference Amplifier Voltmeter operation and analysis Operational Amplifier Voltmeter Circuits design and analysis	2	1	2
3.	AC Electronic Voltmeters classification, operation, and comparison Ohm and Current Measurements Circuits design and analysis	4	2	4
4.	Digital Voltmeters and Frequency Meters: Digital Voltmeters DVMs Circuits design and analysis (Mini-Project) Digital Frequency Meters operation and performance	2	1	2
5.	Analog CRT Oscilloscope: CRT Oscilloscope construction, operation, and performance Deflection Amplifiers Circuit design and analysis	2	1	2
6.	Sweep Generator Circuit design and analysis. Automatic Time Base components, operation, and integration	4	2	4
7.	Assessment (Mid- Term)	-	-	-
8.	Dual Trace Oscilloscope classification, operation, and comparison Waveforms' parameters display, measurement, and analysis	2	1	2
9.	Digital-Storage Oscilloscopes (DSO): Digital Storage Oscilloscope construction and modes of operations. Digital Storage Oscilloscope Circuits design and analysis	4	2	4
10.	Waveform Analysis Instruments: Analog Spectrum Analyzer operation, display, and performance Digital Spectrum Analyzer operation, display, and performance	2	1	2
11.	Data Acquisition Systems Data acquisition systems construction, operation, and specification (Report)	2	1	2
12.	Digital to Analog Converters (D/A) Circuits design and analysis Analog to Digital Converters (A/D) Circuits design and analysis	2	1	2
13.	Revision	1		1
14.	Revision		1	
15.	Revision	1		1
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix.

Course Topics	Course Competencies												
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13
1. Emitter Follower Voltmeters classification, operation, and comparison	1	1											
2. Difference Amplifier Voltmeter operation and analysis	1	1											
3. Operational Amplifier Voltmeter Circuits design and analysis	1	1											
4. AC Electronic Voltmeters classification, operation, and comparison	1	1											
5. Ohm and Current Measurements Circuits design and analysis	1	1											
6. Digital Voltmeters DVMs Circuits design and analysis (Mini-Project)			1									1	1
7. Digital Frequency Meters operation and performance			1										
8. Analog CRT Oscilloscope construction, operation, and performance				1									
9. Deflection Amplifiers Circuit design and analysis				1									
10. Sweep Generator Circuit design and analysis.				1									
11. Automatic Time Base components, operation, and integration				1									
12. Dual Trace Oscilloscope classification, operation, and comparison				1									
13. Waveforms' parameters display, measurement, and analysis						1							
14. Digital Storage Oscilloscope construction, and modes of operations.					1								
15. Digital Storage Oscilloscope Circuits design and analysis					1								
16. Analog Spectrum Analyzer operation, display, and performance							1		1				
17. Digital Spectrum Analyzer operation, display, and performance								1	1				
18. Data acquisition systems construction, operation, and specification (Report)										1		1	
19. Digital to Analog Converters (D/A) Circuits design and analysis											1		
20. Analog to Digital Converters (A/D) Circuits design and analysis											1		
Topics Covering Competencies	5	5	2	5	2	1	1	1	2	1	2	2	1

5- Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods					Learning Methods			Assessment Method					
	Lecture	Tutorials	Problem solving	Laboratory & Experiments	Discussions & seminars	Self - Learning	Research & Report	Assignments	Written Exam	Practical Exam	Quizzes	Assignments	Research & Report	Mini - Project
c1					1	1		1				1	1	
c2	1	1	1						1		1			
c3	1	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		
c7	1	1		1					1	1	1			
c8	1	1	1	1					1			1		
c9	1	1		1					1	1		1		
c10	1	1	1	1					1	1	1			
c11	1	1	1					1	1			1	1	
c12				1									1	
c13				1										1
Σ	10	10	7	10	1	1	1	2	10	6	5	6	3	2

6-Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work:	Assignments	2 Assignments per semester	10
	Quizzes	2 Quizzes per semester	10
	Mini-Project/Report	Once per semester	5 (Bonus)
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references

7-1 Course notes:

- Hany Tawfik and Shouman S.E.I. (2018) Electronic Measurements “Theoretical Part”, Cairo, Egypt.
- Hany Tawfik and Shouman S.E.I. (2018) Electronic Measurements “Practical Part”, Cairo, Egypt.

7-2 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 Kinesley Pearson Education, USA.

7-3 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.

7-4 Recommended Web Sites

MIT Open courseware

<https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-071j-introduction-to-electronics-signals-and-measurement-spring-2006/> (Last accessed January 2021)

8- Facilities required for teaching and learning:

Lectures room equipped with OHP and data show facility.

Complete Lab for Electronic Measurements.

Course Coordinator

Prof. Dr. Shouman S.E.I.

Head of the Department:

Prof. Dr. Shouman S.E.I.

Date:

August, 2020

Modern Academy for Engineering
and Technology in Maadi



Course Specification
ELCn218: Electrical Machines and Power

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program. Computer Engineering and Information Technology BSc Program.
Department offering the program:	Electronic Engineering and Communication Technology Department. Computer Engineering and Information Technology Department.
Department offering the course:	Electronic Engineering and Communication Technology Department.
Date of specifications approval:	August, 2020

B - Basic information

Title: Electrical Machines and Power	Code: ELCn218	Level: Level 2 (Junior), Seventh Semester
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 2 Practical: 1
	Pre-requisite: ELCn112	

C - Professional information

1 – Course Learning Objectives:

A study of this course will enable the student to be familiar with all kinds of machines and transformers, and the application theory of their operations.

2 – Intended Learning Outcomes (ILOS)

- c1- Understand electrical power sources. (C1, C2)
- c2- Construct electrical transformer. (C2, C4)
- c3- Analyze theory of operation and applications of electrical transformer. (C3, C9)
- c4- Construct direct current machines; motors and generators. (C2, C4)
- c5- Evaluate power losses and efficiency of direct current machines. (C1, C3, C9)
- c6- Realize three phase induction machine construction, theory of operation, torque speed characteristics, speed control, equivalent circuit, and efficiency. (C1, C2, C9)
- c7- Understand Synchronous machine operation, equivalent circuit, and voltage regulation. (C4, C9)
- c8- Analyze Transmission line system. (C2)
- c9- Compare between direct current transmission system and alternating current transmission system. (C4)
- c10- Model transmission line. (C3, C6)
- c11- Implement electrical power distribution for direct current system and alternating current system. (C3, C4)
- c12- Realize High voltage transmission lines and underground cables. (C2, C4)
- c13- Understand the principles of power converter operations. (C6, C9)
- c14- Find the equivalent circuits of transformer and machines. (C11)
- c15- Allocate any fault and know its reason. (C3, C14)
- c16- Calculate the suitable machine parameters necessary for specific load. (C11)
- c17- Choose the suitable operating torque-speed point for best machine performance. (C12)
- c18- Calculate transformer and machines efficiency. (C11)

This course contributes in the following competencies: **C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C12, C13, & C14.**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Circuit analysis of transformers.	2	1	-
2	Transformer construction.	2	-	2
3	Equivalent circuit of a transformer.	2	1	4
4	Transformer test.	2	2	4
5	Construction of DC machine.	2	-	1
6	Classification of DC machine.	2	1	4
7	Assessment (Mid- Term)	-	-	-
8	Circuit equations of DC machine.	2	2	2
9	DC machine efficiency.	2	1	2
10	Construction of induction motors.	2	-	1
11	Torque-speed characteristics.	2	1	3
	Efficiency of induction motor.	1	1	2
12	Construction of synchronous machine.	2	-	1
	Circuit equations of synchronous machine.	1	2	-
13	Operation synchronous machine.	2	1	2
14	Transmission line system and modeling	1	-	-
	Comparison between direct current transmission system and alternating current transmission system	1	1	-
15	Types of power converters.	1	-	-
	Application and operation of power converters.	1	1	2
Total hours		30	15	30

4- Course content/Course Competencies mapping matrix

Topic	Course Competencies																	
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
Circuit analysis of transformers.			1						1									
Transformer construction.		1		1														
Equivalent circuit of a transformer.			1					1	1									

Topic	Course Competencies																	
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
Transformer test.			1		1													
Construction of DC machine.		1		1														
Classification of DC machine.		1		1														
Circuit equations of DC machine.											1							
DC machine efficiency.	1		1						1									
Construction of induction motors.	1	1							1									
Torque-speed characteristics.			1									1	1					
Efficiency of induction motor.			1					1			1		1					
Construction of synchronous machine.				1					1									
Circuit equations of synchronous machine.				1					1									
Operation synchronous machine.				1					1									
Transmission line system and modelling		1	1					1										
Comparison between direct current transmission system and alternating current transmission system		1	1	1														
Types of power converters.													1	1				
Application and operation of power converters.						1			1									
Topics Covering Competences	2	6	8	7	1	1	1	2	8	0	2	1	3	1	0	0	0	0

5 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	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
c1	1					1			1	1	1	1	1
c2	1	1				1	1		1		1	1	1
c3	1			1	1				1			1	1
c4	1	1			1				1		1	1	1
c5	1			1	1				1	1	1	1	1
c6	1	1		1	1	1	1					1	1
c7	1	1		1	1								
c8	1	1					1						
c9	1			1	1								
c10	1			1	1								
c11	1				1								
c12	1				1								
c13	1			1	1								
c14	1			1					1	1	1	1	1
c15	1					1			1	1	1	1	1
c16	1			1					1			1	1
c17				1		1			1			1	1
c18	1			1		1			1		1	1	1
∑	18	5	0	11	10	6	3	0	10	4	6	10	10

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Mid-Term Exam	7-th Week	10
	12-th Week	10
Semester Work	Quizzes	4 Quizzes (every 3 weeks)
	Assignments	Bi-Weekly
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes:

- H. Gamal, *Electrical Machines and Power*, Cairo.
- H. Gamal, *Electrical Machines and Power*, Practical Part, Cairo, 2008.

7.2 Required books

- Stephan J. Chapman, *Electrical Machinery Fundamentals*, 4th edition, Mc Graw-Hill, 2005.

7.3 Recommended books:

- A. E. Fitzgerald, C. Kingsley, and S.D.U. man, *Electrical Machinery*, 6th edition, 2003.

7-4 Periodicals, Web sites, etc.

- Educational CD.
- <http://www.slideshare.net/jayleong111/electrical-machines-drives-and-power-systems>.
- <http://www.amazon.com/Electrical-Machines-Drives-Systems-Edition/dp/0131776916>.

8- Facilities required for teaching and learning:

- Electrical Machines Lab.
- Data Show.

Course coordinator: Dr. Haytham Gamal Mohamed.
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



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: August, 2020

B - Basic Information

Title: Communications -1
Credit Hours: 3

Code: ELCn215 **Level:** 2nd Spring
Lectures: 2 **Tutorial/Exercise:**1 **Practical:** 2
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 – Competencies

- c1. Demonstrate principles of communications system and its stages. (C1, C3)
- c2. Classify electrical signals, communication channels and media (C3, C8).
- c3. Demonstrate concept of information theory (C1, C8).
- c4. Analyze Amplitude modulation process AM (C17).
- c5. Analyze Frequency modulation process FM (C17)
- c6. Analyze Phase modulation process FM (C17)
- c7. Investigate suitable solution for communication channel problem (C1).
- c8. Discriminate between different techniques of analog continuous wave modulation techniques (C9, C10)
- c9. Estimate waveform, spectrum and bandwidth at the output of each stage in analog communication system (C9, C10)
- c10. Connect electronic module simulating various stages in communication circuits filters, oscillators and modulators (C11, C12)
- c11. Observe and record input and output signals obtained by each communication system module using oscilloscopes then comment on results (C11, C12, C18).
- c12. Take measurements for signal voltages and frequency obtained at the output of various types of filters and oscillators (C12, C14, C18)
- c13. Examine simple communication system using various forms of analog modulation/ demodulation modules: DSB-SS, SSB, FM, and PM (C11, C12, C14).
- c14. Communicate with others; work in a team and involvement in group discussion and seminars (C8).
- c15. Present data and results orally and in written form (C10).
- c16. Search for information's in references and in internet (C5).
- c17. Practice self-learning (C10)

This course contributes in the following program competencies: **C1, C3, C5, C8, C9, C10, C11, C12, C14, C17 & C18**

3. Contents

Week	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	Assessment (Mid- Term)	-	-	-
8	Baseband and band pass modulation.	2	0	0
9	Amplitude modulation and its different forms: AM, DSB-SC, SSB – Amplitude demodulation.	3	2	3
10	Television communication system (transmission and reception) using VSB technique.	3	2	2
11	Frequency modulation and demodulation.	1	-	-
12	Phase modulation and demodulation.	1	-	1
13		-	1	-
14	Revision	2	0	0
15		3	2	3
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix:

Topics	Course Competencies																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
1- Introduction to basic principles of communication systems.	1	1															
2-Basics of signaling and various sources of information signals.	1	1					1	1	1								
3- Different forms of communication channels and media.		1					1		1								
4- Communication channels; types, problems and proposed solution.	1	1					1		1								
5- Main concept of information theory.			1						1								

Topics	Course Competencies																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
6- Modulation process – comparison between analog and digital modulation – C.W. modulation techniques.				1				1		1	1	1				1	
7- Baseband and band pass modulation.				1				1		1	1	1				1	
8- Amplitude modulation and its different forms: AM, DSB-SC, SSB – Amplitude demodulation.				1				1		1	1	1	1	1	1	1	1
9- Television communication system (transmission and reception) using VSB technique.				1				1	1								
10- Frequency modulation and demodulation.					1	1	1			1	1	1	1	1	1	1	1
11- Phase modulation and demodulation.						1	1			1	1	1	1		1	1	1
Topics Covering Competencies	3	4	1	4	1	2	5	5	5	5	5	5	3	3	5	3	3

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports &	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1		1		
c4	1			1	1	1			1	1	1	1	1		
c5	1			1	1	1			1	1	1	1	1		
c6	1			1	1	1			1	1	1	1	1	1	
c7	1	1	1				1		1	1	1				
c8	1	1		1	1		1	1	1		1		1	1	1
c9	1			1	1				1	1	1		1	1	
c10						1	1		1			1			
c11						1	1		1			1			
c12						1	1		1			1			
c13						1	1		1						
c14		1	1					1						1	1
c15		1	1					1							
c16		1	1					1							
c17		1	1					1						1	
Σ	9	7	6	8	7	7	9	8	9	8	9	6	8	5	2

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	10
	Tutorials	3 Assignments per semester	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Communications (I) "Theoretical part"
- Communications (I) "Practical part"

7-2 Required books

- B. Lathi, *Modern Digital and Analog communication systems*, Oxford press 1998.
- kendey,Davis *Electronic Communication systems*, Mc Graw-Hill Book

7-3 Recommended books:

- S. Haykin, *Communication systems*, 4th edition J. W. 2001.
- Yadav, *Analog Communication system*, 1st edition University Science Press, 2008.

7-4 Periodicals, Web sites, etc.

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

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

8- Facilities required for teaching and learning:

- Analog Communication Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Nelly Muhammad Hussain

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn213: Microelectronics Circuits-2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology BSc Program
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: August, 2020

B - Basic Information

Title: Microelectronics Circuits-2 **Code:** ELCn 213 **Level:** 3rd Spring
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**2 **Practical:** 1
Pre-requisite: ELCn212

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge, skills, and attitudes) related to the operation of the power amplifier and its basic elements. They should compete on the design, calculate, operate, and analyze the performance of the power amplifiers. Understand the basic theory of oscillations

2 – Competencies

- c1-Analyze the biasing methods of any BJT transistor circuit. (C1, C2, C5, C11, C13, C14, C15)
- c2- Analyze the configurations of BJT. (C1, C2, C5, C11, C13, C14, C15)
- c3- Analyze the frequency response of Common emitter amplifiers. (C1, C2, C5, C11, C13, C14, C15)
- c4- Analyze the power amplifier. (C1, C2, C15)
- c5- Understand the basic theory of oscillators and function generators. (C1, C15)
- c6- Design the bias of simple circuits. (C1, C2, C3, C6, C12, C13, C15, C17)
- c7- Deduce the frequency response at low and high frequencies transistor amplifier. (C1, C3, C8)
- c8- Evaluate the performance of the power amplifier. (C2, C3, C5, C11, C15)
- c9- Identify/describe the oscillation theory. (C1, C2, C3)
- c10- Measure the transistor characteristics. (C2, C14)
- c11-Measure characteristics of a transistor amplifier. (C2, C, C14)
- c12- Measure the frequency response of amplifiers. (C14, C)
- c13- Measure the power amplifier parameters. (C2, C14)
- c14- Work in a stressful environment and within constraints (C7)
- c15- Communicate effectively through assignments. (C2, C3, C7)
- c16- Effectively manage tasks, time, and resources. (C7)
- c17- Search for information and engage in life-long self-learning discipline. (C7).

This course contributes to the following program competencies: **C1 C2 C3 C5 C7 C8 C11 C12 C13 C14 C15 C17**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	The construction of the Bipolar Junction Transistors.	2	2	1
	The I-V characteristic curve of the BJT.			
	BJT Operating Regions and Circuit Configurations.			
2	DC analysis of the BJT	2	2	1
	<ul style="list-style-type: none"> ➤ Basic base bias ➤ Self-base bias 			
3	<ul style="list-style-type: none"> ➤ Voltage divider bias ➤ Multistage DC bias 	2	2	1
4	The transistor as an amplifier <ul style="list-style-type: none"> ➤ The parameters of amplifiers 	2	2	1
5	<ul style="list-style-type: none"> ➤ The small-signal analysis ➤ The amplifier configurations 	2	2	1
6	➤ The ac analysis of the Common Emitter amplifier	2	2	1
7	➤ Assessment (Mid- Term)	-	-	-
8	➤ The ac analysis of the Common Base amplifier	2	2	1
9	➤ The ac analysis of the Common Collector amplifier	2	2	1
10	Types of power amplifiers	2	2	1
11	Class A power amplifier	2	2	1
12	The frequency response of the amplifier	2	2	1
13	➤ Amplifier Frequency Response due to external capacitors.	2	2	0
14	➤ Amplifier Frequency Response due to internal capacitors.	2	2	0
15	Signal Generators & Wave shaping circuits	2	2	1
	Design and implement a power amplifier.	2	2	4
Total hours		30	30	15

4. Course content/Course Competencies mapping matrix.

Topic	Course Competences																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
The construction of the Bipolar Junction Transistors.	1																
The I-V characteristic curve of the BJT.	1	1								1							
BJT Operating Regions and Circuit Configurations.	1									1							
DC analysis of the BJT	1					1				1							
<ul style="list-style-type: none"> ➤ Basic base bias ➤ Self- base bias 																	
<ul style="list-style-type: none"> ➤ Voltage divider bias ➤ Multistage DC bias 	1					1				1							
The transistor as an amplifier								1			1						
<ul style="list-style-type: none"> ➤ The parameters of amplifiers ➤ The small-signal analysis 		1									1						

➤ The amplifier configurations																	
➤ The ac analysis of the Common Emitter amplifier		1		1					1		1			1	1	1	
➤ The ac analysis of the Common Base amplifier		1							1		1			1	1	1	
➤ The ac analysis of the Common Collector amplifier									1		1			1	1	1	
Types of power amplifiers				1				1	1					1	1	1	1
Class A power amplifier	1	1		1				1			1		1				1
The frequency response of the amplifier			1					1					1				1
Amplifier Frequency Response due to external capacitors.			1					1				1		1	1	1	1
Amplifier Frequency Response due to internal capacitors.			1					1				1		1	1	1	1
Signal Generators & Wave shaping circuits					1				1				1				1
Design and implement a power amplifier.	1	1		1				1			1		1	1	1	1	1
Topics Covering Competencies	7	6	3	4	1	2	3	4	5	4	7	2	4	7	7	7	7

5 - Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem-solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1	1	1		1	1	1		1	1	1	1
c2	1	1	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
c5	1	1			1			1			1	1	1		1
c6				1	1	1	1			1		1	1		1
c7				1	1		1					1	1		1
c8				1	1	1	1	1			1	1	1		1
c9				1	1		1					1	1		1
c10						1								1	1
c11						1								1	1
c12						1								1	1

c13						1								1	1
c14						1									1
c15						1									1
c16						1									1
c17						1									1
Σ	13	13	3	10	3	8	6	10	2	11	11	3	9	8	6

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one every 4 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Microelectronics Circuits-2 “Theoretical part”
- Microelectronics Circuits-2 “Practical part”

7-7 Required books.

- Sedra-Smith (2009), Microelectronics Circuits -6th ed, Oxford University Press, USA, ISBN: 978-0-19-973851-9

7-8 Recommended books:

- Jacob Milliman (1991), electronic devices & circuits -9th ed, McGraw Hill series, USA, ISBN: 0-07-462243-9

7-9 Periodicals, Web sites, etc.

- <https://www.circuitbread.com/equations/bipolar-junction-transistors-dc-analysis>. (Last accessed January 2021)
- <http://www.learningaboutelectronics.com/Articles/Dc-analysis-of-a-bipolar-junction-transistor-circuit> (Last accessed January 2021)
- https://www.electronics-tutorials.ws/amplifier/amp_1.html. (Last accessed January 2021)
- https://www.tutorialspoint.com/amplifiers/power_amplifiers.htm. (Last accessed January 2021)
- <https://www.electrical4u.com/what-is-an-oscillator/> (Last accessed January 2021)

8- 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

Head of the Department:

Prof. Dr. Shouman S.E.I.

Date:

August, 2020

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 Scienc Department
Date of specifications approval:	August 2020

B - Basic Information

Title: Mathematics-8(Complex Analysis and Partial Differential Equations)	Code: MTHn208	Level: 2 nd Spring	
Credit Hours: 2	Lectures: 2	Tutorial/Exercise: 1	Practical: ---
	Pre-requisite: MTHn002		

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge, skills, and attitudes) related to 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 – Competences

- c1. Identify complex numbers, D'Moiver theorem, complex and analytic functions. (C1, C5)
- c2. Explain conformal mappings and bilinear transformation. (C1, C5)
- c3. Explain power series and integration by integration by methods of residues. (C1, C5)
- c4. Identify basic concepts, classification, and canonical form of PDEs. (C1, C5)
- c5. Investigate method of separation of variables for heat, wave, and Laplace equations. (C1, C5, C9)
- c6. Solution of PDEs using Laplace transform. (C1, C5, C9)
- c7. Investigate D'Moiver theorem, complex and analytic functions. (C1, C5, C9)
- c8. Explore and recognize conformal mappings and bilinear transformation. (C1, C5, C9)
- c9. Expand and integrate complex functions using different methods. (C1, C5, C9)
- c10. Develop several methods for solving PDEs. (C1, C5, C9)
- c11. Apply the method of separation of variables to solve heat, wave, and Laplace equations. (C1, C5, C9)
- c12. Solve PDEs using Laplace transform and Solve partial differential equations describing real systems. (C1, C5, C9)

This course contributes in the following program competencies: **C1, C5, C7, C8, C9 & C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical 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	➤ Mid term	2		
8	➤ Integration by method of residues.	2	1	—
9	➤ Introduction to PDEs, Basic concepts of PDEs	3	1	—
10	➤ Classifications and conical forms of 2 nd order linear PDEs.	3	1	—
11	➤ Method of separation of variables for heat equation.	3	2	—
12	➤ Wave and Laplace equations. D'Alembert solution of wave equation.	3	2	—
13,14,15	➤ Solution of PDEs using Laplace transforms.	2	1	—
Total hours		30	15	—

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Complex numbers, arithmetic operations, polar forms	1						1					
D'Moiver theorem, complex functions. Analytic function	1						1					
Elementary functions of complex variables	1						1					
Mapping, and conformal mapping.		1						1				
Bilinear transformation, complex integrals.		1						1				
Power series (Taylor and Laurent series).			1						1			
Integration by method of residues.			1						1			
Introduction to PDEs, Basic concepts of PDEs				1						1		
Classifications and conical forms of 2 nd order linear PDEs.				1						1		
Method of separation of variables for heat equation.					1					1	1	
Wave and Laplace equations. D'Alembert solution of wave equation.					1						1	
Solution of PDEs using Laplace transforms.						1						1
Topics Covering Competences	3	2	2	2	3	1	3	2	2	3	2	1

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method			
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Term papers	Assignments
c1	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	1	1
c5	1		1	1	1	1	1	1	1
c6	1				1	1	1		1
c7	1		1	1		1	1		1
c8	1		1	1		1	1	1	1
c9	1	1	1	1	1	1		1	1
c10	1		1	1		1			1
c11	1		1	1		1		1	1
c12	1	1	1	1	1	1		1	1
Σ	12	3	11	10	6	12	8	7	12

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Bi-Weekly	40
	Reports/Research		
	Assignments		
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

Moamen Wafaae and Ashraf Taha, Complex Analysis and partial Differential Equations, Lecture Notes, ModernAcademy, 2013.

7-2 Required books:

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

Recommended books:

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

7-4 Periodicals, Web sites, etc.

www.sosmath.com

8- Facilities required for teaching and learning:

- Library and required references.
- High speed internet and communication facilities for distance learning..

Course coordinator: Dr. Ghada Salem
Head of the Department: Associat Professor / Ashraf Taha EL-Sayed
Date: August 2020

Course Specification
ELCn261: Seminar

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: August, 2020

B - Basic Information

Title: Seminar **Code:** ELCn261 **Level:** 2nd Fall
Credit Hours: 1 **Lectures:** - **Tutorial/Exercise:** 2 **Practical:** -
Pre-requisite: GENn141a, GENn142, and 66Credits

C - Professional information

1 - Course Learning Objectives:

The objective of this course is to provide the students the relevant competences (knowledge, skills, and attitudes) needed to understand and apply the basic principles required to prepare and give a successful seminar about contemporary topics in their field of study. The students are supervised and asked to practice research, select relevant topics, allocate relevant references, summarize, write a report, and prepare to give a speak and discussion about the selected topics using relevant demonstration methods.

3 - Competencies

- c1. Practice research, select relevant topics, and allocate relevant references. (C5, C10)
- c2. Summarize and write a report about the selected topic (C7, C8)
- c3. Prepare a presentation, give a speak, and involve in discussion about the selected topic. (C8).

This course contributes in the following program competencies: **C5, C7, C8, & C10.**

3 - Course Contents

Course Topics	Lecture hours	Tutorial hours	Practical hours
Topics are selected by each, or group of students	-	2/W	-
Total hours	-	30	-

4 - Course content/Course Competencies mapping matrix.

Course Topics	Course Competencies											
	c1	c2	c3	-	-	-	-	-	-	-	-	-
Topics are selected by each, or group of students	1	1	1	-	-	-	-	-	-	-	-	-
Topics Covering Competencies	1	1	1	-	-	-	-	-	-	-	-	-

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods					Learning Methods			Assessment Method					
	Lecture	Tutorials	Problem solving	Laboratory & Experiments	Discussions & seminars	Self - Learning	Research & Report	Assignments	Discussions & seminars	Oral Exam	Quizzes	Assignments	Research & Report	Mini - Project
c1		1			1	1			1					
c2		1			1	1	1		1				1	
c3		1			1	1	1		1	1			1	
Σ	-	3	-	-	3	3	3	-	3	1	-	-	2	-

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work (Research Report)	2 nd , 4 th , 6 th , 8 th , 10 th , 12 th Weeks	60
Mid-Term Exam	-	-
Practical Exam	-	-
Oral Exam	Final Report	10
	Presentation	10
	Discussion	20
Total		100

7- List of references:

- Relevant references are selected by the students.

8 - Facilities required for teaching and learning:

- Computer, and Data show

Course coordinator: Dr. Fawzy Hashim
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: August, 2020

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Course Specification

ENGN213a: Advanced Computer Systems Implementation.

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

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:

August 2020

B - Basic Information

Title: Advanced Computer Systems Implementation

Code ENGN213a

Level: 2rd 3rd Fall, spring

Credit Hours: 3

Lectures: 2

Tutorial/Exercise:-

Practical: -2

Pre-requisite: CMPn010

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences related to the construction and operation of the computer technology from various aspects. The course provides overview of Desktop and Laptop PC Hardware, software and programming tools, as well as networking concepts. Installation and configuration of Windows, and Other operating Systems: Linux, Android shall also discussed. The course enables the student to establish internal and external networking and how to protect them from various types of attacks. We also offer an overview of artificial intelligence and Machine learning

2 - Competencies

- c1. Recognize and identify PC hardware specifications that suit the required applications according to various disciplines (C6,C15)
- c2. Recognize and identify different platforms of system software that suite the hardware and the required application software (C2,C3)
- c3 Investigate the effect of different types of memory and the methods used to store data according to the different architecture of modern computers (C7)
- c4. Concepts of Different platforms (Windows, Linux, and Android) (C15)
- c5. recognize and identify the structure of computer architecture, network structure and Evaluate the performance of the system (C13)
- c6. Use a wide range of analytical tools, techniques, and software packages pertaining for programming the computer and security attacks and protection tools (C5)
- c7. Collaborate effectively with different uses of artificial intelligence, Machine Learning, and how to include it in all disciplines(C6,C15)
- c8. Communicate effectively and present data and results orally and in written form. Use ICT facilities in presentations, and manage resources efficiently(C8)
- c9. Practice self-learning, Search for information's in references, journals and in internet (C7,C10)
- c10. Use experimental facilities to Practice research techniques and methods of investigation as an inherent part of learning (C5)

This course contributes in the following competencies: **C2, C3, C5, C6, C7, C8, C10, C13, &C15**

3- Contents

week	Topic	Lecture hours	Practical hours
1	Introduction to the numbering systems. Introduction to basic personnel computer hardware components.	2	2
2	Personnel Computer peripherals equipment hardware (screens, printers, hard disks,) Different types of PC software and programming tools	2	2
3	Different platforms (Windows, Linux, and Android) Overview of Windows, Linux, and Android Operating systems	2	2
4	Introduction to PC internal and external Memory	2	2
5	How data is being stored and organized in PC computer's memory	2	2
6	PC networking. (Definitions, types, end to end and network components, protocols, vendors, courses, simple labs)	2	2
7	Assessment (Midterm exam)	2	
8	PC security attacks and protection tools	2	2
9	Gentle introduction to PC: hardware, Software, and network architecture	2	2
10	Choosing and running a pilot project	2	2
11	Database (definitions, types, vendors, courses, simple implementation)	2	2
12	Choosing and running a pilot project	2	2
13	AI, Machine learning,	2	2
14	Data science.	2	2
15	Choosing and running a pilot project	2	2
Total hours		30	30

4. Course content/Course Competencies mapping matrix

Topic	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10
Introduction to the numbering systems. Introduction to basic personnel computer hardware components.	1	1	1							
Personnel Computer peripherals equipment hardware (screens, printers, hard disks,) Different types of PC software and programming tools	1			1	1	1	1			
Different platforms (Windows, Linux, and Android) Overview of Windows, Linux, and Android Operating systems		1		1		1		1	1	1
Introduction to PC internal and external Memory	1		1		1	1	1			
How data is being stored and organized in PC computer's memory	1	1		1			1			
PC networking. (Definitions, types, end to end and network components, protocols, vendors, courses, simple labs)	1				1			1	1	1
PC security attacks and protection tools		1		1	1			1	1	1
Assessment (Midterm exam)	1	1	1	1	1					
Gentle introduction to PC: hardware, Software, and network architecture	1	1			1					
Choosing and running a pilot project			1	1				1	1	1
Database (definitions, types, vendors, courses, simple implementation)		1	1			1		1	1	1

Choosing and running a pilot project			1	1		1		1	1	1
AI, Machine learning, Data science.						1	1	1	1	1
Choosing and running a pilot project			1	1		1	1	1	1	1
Topics Covering Competences	7	7	7	8	6	7	5	8	8	8

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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	
c4	1	1		1	1	1			1	1	1	1		1	
c5	1	1		1	1	1			1	1	1	1		1	
c6	1	1		1		1			1	1	1	1		1	
c7	1	1		1	1	1			1	1	1	1		1	
c8		1	1			1		1	1		1	1			
c9	1	1		1		1			1	1	1	1		1	
c10	1	1		1		1			1	1	1	1		1	
c11		1	1			1		1			1				
Σ	9	11	2	9	5	10	0	2	9	9	10	10	0	9	0

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: None

7-2 Required books

- 1.W. Stallings, Computer organization and architecture: designing for performance, Tenth edition. Boston: Pearson-Prentice Hall, 2016.
- 2.R. D. Necaise, Data structures and algorithms using Python. Hoboken, N.J: Wiley, 2011.
- 3.R. Elmasri and S. Navathe, Fundamentals of database systems, Seventh edition. Hoboken, NJ: Pearson, 2016.
- 4.E. Matthes, Python crash course: a hands-on, project-based introduction to programming. San Francisco: No Starch Press, 2016.

7-10 Recommended books: None

7-4 Periodicals, Web sites, etc.

<https://www.eecs.berkeley.edu/Courses/Data/188.html>

<http://www.GenLib.org/> .

<http://www.talkthecold.com/bizgoogle/> .<http://www.SCI-hub.org/> .

<http://www.scrius.com/>

<https://logic.ly/demo>

<https://www.netacad.com/>

<https://www.geeksforgeeks.org/>

<https://www.coursera.org/>

<https://www.udacity.com/>

<https://www.udemy.com/>

8- Facilities required for teaching and learning:

- Computer Lab.
- Computer, Data show and Computer package.
- Internet and communication facility.

Course coordinator:

Dr. Seham Ebrahim

Head of the Department:

Dr. Abd Elmoneim FoudA

Date:

August 2020

Modern Academy

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Course Specification ELCn260: Industrial Training-1

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: August 2020

B - Basic Information

Title: Industrial Training-1 **Code:** ELCn260 **Level:** 2nd Summer
Credit Hours: 0 **Lectures:** - **Tutorial/Exercise:** - **Practical:** -
Pre-requisite: ELCn160

C - Professional information

1 – Course Learning Objectives:

By the end industrial training course, students will gain skills of one of two fields:

1-1 Embedded Systems Training:

- Understanding principles of micro- controllers programming using micro- C language.
- Learn the basics and items of embedded systems.
- Develop the student's skills by analyze of ATMIGA and Ardoinu interfacing.
- Examin students' ability of mini- projects execution using different models of micro- controllers

1-2 PLC Training:

- Understanding principles of classic control Design and implementation motor starting methods.
- Design and implement control timer circuits and switches.
- Read wiring diagram of control panels.
- Make control system troubleshooting.
- Understand the hardware possible configuration (single rack, expansion rack and distributed I/O)
- Create Symbols, programming, simulation and monitoring online
- PLC download/ Upload, Diagnostic of hardware and software errors.
- Programming of function with data block and Function Block with its instance data block.
- Programming of counter, timer, math and comparison functions.

2 – Competencies

2-1 Competencies of Embedded systems training:

- c1- Use the embedded C for Micro-controllers. (C2, C6)
- c2- Operate The Real-Time Systems and Scheduling. (C2, C6)
- c3- Apply the Verification and Testing of Embedded Systems. (C2, C6)
- c4- Design the Embedded Software Architecture. (C11, C13)
- c5- Design the Embedded Software Interfacing. (C11, C13)
- c6- Explain Keypad, LCD, switches, and Motors Interfacing and driver. (C6, C11)
- c7- Explain the External Interrupts. (C2, C13)
- c8- Design the Analog to digital converter driver. (C11, C17)

2-2 Competencies of PLC:

- c1-** Illustrate the different types and technical specifications of hardware components (Switches, Pushbuttons, Contactors, Relays, Motors Sensors, Timers, Power supply, and Overload relay). (C2, C11, C13)
- c2-** Explain Examples of Power Circuit and Control Circuit. (C2, C6)
- c3-** Operate Practical Exercises for the Start and stop for actual motor from (single /multiple positions). (C6, C17)
- c4-** Explain DC motor, Single Phase, and Three Phase Motors applications (Reverse Direction, control of the sequence of operations, and On and Off time delay operations). (C13, C17)
- c5-** Discuss the advantages and disadvantages of classic and modern control systems. (C6, C11)
- c6-** Test the PLC Components and Inputs / Outputs Connections. (C6, C11, C13)
- c7-** Analyze the PLC Programming Instructions and applications. (C17)

This course contributes in the following program competencies: **C2, C6, C11, C13 & C17.**

3-1 Contents of Imbedded Systems

Session No.	Topics	Hours
1	C-language life cycle, data types, and C- operations	4
2	Conditional Statements in C	4
3	Loops in C	4
4	Arrays, Sorting, and Searching Algorithms	4
5	Embedded C, DIO, and LCD and Keypad	4
6	Mini Project	4
7	Computer architecture 1 (processor – memory – I/O)	4
8	Computer architecture 2 (processor – memory – I/O)	4
9	ADC, Interrupt, and Timer	4
10	Electrical Switches	4
11	Motors	4
12	PWM	4
13	UART	4
14	Analog and Digital sensors	4
15	Final Project	4
Total Number of Hours		60

3-2 Contents of PLC

Session No.	Topics	Hours
1	Design and implementation motor starting methods.	5
2	Design and implement control timer circuits.	5
3	How to use and classify Proximity switch and design its circuit.	5
4	Use a program (EKTS) for simulation Control Circuit.	5
5	Read wiring diagram of control panels.	5
6	Make control system troubleshooting.	5
7	Introduction to industrial control system	5
8	Min- Project	2
9	Panels types (Distribution, ATS, P.F, MCC, Control and Control	5
10	The components used in the Panels (Circuit breaker, fuses, contactor, overload, Relay, timers, etc....)	6
11	The components used in the field (limit switches, proximity switches, photocells, load cell, motors, etc...)	6
12	How to make a combination between these components to make a circuit.	6
Total Number of Hours		60

4 - Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	Learning Methods			Assesment Methods				
	Lecture	Presentations & Movies	Discussions & seminars	Laboratory & Experiments	Modeling and Simulation	Written Exam	Practical Exam	Mini Project Report
c1	1					1		
c2	1					1		
c3	1		1			1		
c4	1			1	1	1	1	
c5	1			1	1	1	1	
c6	1			1	1	1	1	
c7	1	1	1		1	1		
c8	1	1			1			1
Σ	8	2	2	3	5	7	3	1

6- Assessment Timing and Grading:

Assessment Method	Grade (Degrees)
Students Participation	20
Mini- project	20
Final Evaluation Project	20
Final Oral Discussion	40
Total	100

7- List of references:

7-1 Course notes: None

7-2 Required books: None

7-3 Recommended books: None

7.4 Recommended Web Site

- <http://www.imtschool.com/>
- http://www.aast.edu/ar/news.php?unit_id=1&language=2&event=287&get_event_type=1

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.
- PC Lab with licensed Software
- Micro- Controller Drivers.

Course coordinator: Dr. Sara Mohammed Hassan

Head of the Department: Prof. Dr. Shouman S. El.

Date: August 2020

Modern Academy

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Course Specification ELCn321: 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: August, 2020

B - Basic Information

Title: Communications -2
Credit Hours: 4

Code: ELCn321 **Level:** 3rd Fall
Lectures: 3 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: ELCn215

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 – Competencies

- c1. Investigate principles of pulse communications system (C5, C8, C9).
- c2. Analyze various types of analog pulse modulation techniques: PAM, PWM, and PPM (C3, C9, C17).
- c3. Analyze Various types of digital pulse modulation techniques; PCM and DM (C3, C9, C17)
- c4. Demonstrate stages of Radio communication system (C3, C8, C17)
- c5. Comparative study for different types of digital CW modulation techniques; ASK, PSK, and FSK (C1, C5)
- c6. Investigate internal and external sources of random noises – noise voltage and equivalent temperature calculation (C5, C8)
- c7. Performance of analog and digital comm. systems in the presence of random noises. (C9, C10, C12)
- c8. Sketch sampled signals in both time and frequency domains using different forms of sampling (C1, C8)
- c9. Determine signal waveform obtained at the output of each stage in PCM system (C1, C8)
- c10. Take decision about suitable analog pulse modulation technique based on service needs and channel features (C3, C9, C10)
- c11. Estimate probability of error obtained in the presence of noise channel using different digital modulation techniques (C5, C17)
- c12. Connect electronic module simulating various stages in communication circuits of modulators (PWM – ASK – FSK - PSK) multiplexers (FDM – TDM) (C13, C14, C18)
- c13. Observe and record input and output signals obtained by each communication system module using oscilloscopes then comment on results (C13, C14, C18)
- c14. Take measurements for signal voltages and frequency obtained at the output of various types of modulators (PWM – ASK – FSK - PSK) multiplexers (FDM – TDM) (C13, C14, C18)
- c15. Examine simple communication system using various forms of modulators (PWM – ASK – FSK - PSK) multiplexers (FDM – TDM) (C13, C14, C18)
- c16. Communicate with others; work in a team and involvement in group discussion and seminars (C8, C9)
- c17. Present data and results orally and in written form (C9)
- c18. Search for information's in references and in internet (C8, C9)
- c19. Practice self-learning (C5)

This course contributes in the following program competencies: **C1, C3, C5, C8, C9, C10, C11, C12, C13, C14, C17 & C18**

3. Contents

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	1-Introduction to sampling process.	6	1	0
2	2-Analog pulse modulation techniques: PAM, PWM, and PPM.	10	4	10
3	3- Pulse code modulation PCM.	4	2	6
4	4- Delta modulation DM.	2	2	0
5	5- Digital radio communication systems.	2	1	4
6	6- Modulation techniques used in digital radio comm. systems: ASK, FSK, PSK, QAM, and DPSK.	10	3	10
7	Assessment (Mid- Term)	-	-	-
8	7- Carrier recovery.	3	0	0
9		2	2	0
10	8- Internal and external sources of random noises – noise voltage and equivalent temperature calculation	2	0	0
11		1	-	-
12	9- Performance of analog and digital comm. systems in the presence of random noises.	1	-	-
13		1	1	-
14		1	-	-
15	Revision	-	1	-
Total hours		45	15	30

4. Course content/Course Competencies mapping matrix:

Topic	Course Competencies																		
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18	c19
1-Introduction to sampling process.	1	1						1											
2-Analog pulse modulation techniques: PAM, PWM, and PPM.	1	1						1											
3- Pulse code modulation PCM.			1						1			1		1	1	1	1		
4- Delta modulation DM.			1						1					1	1	1			
5- Digital radio communication systems.				1	1						1						1		
6- Modulation techniques used in digital radio comm. systems: ASK, FSK, PSK, QAM, and DPSK.				1	1					1	1	1	1	1	1	1	1		
7- Carrier recovery.										1	1							1	1
8- Internal and external sources of random noises – noise voltage and equivalent temperature calculation.						1												1	1
9- Performance of analog and digital comm. systems in the presence of random noises.							1			1	1								
Topics Covering Competencies	2	2	2	2	2	1	1	2	2	3	4	2	1	3	3	3	3	2	2

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1		1		
c4	1			1	1	1			1	1	1	1	1		
c5	1			1	1	1			1	1	1	1	1		
c6	1			1	1	1			1	1	1	1	1	1	
c7	1	1	1				1		1	1	1				
c8	1	1		1	1		1	1	1		1		1	1	1
c9	1			1	1				1	1	1		1	1	
c10						1	1		1			1			
c11						1	1		1			1			
c12						1	1		1			1			
c13						1	1		1						
c14	1	1	1					1						1	1
c15	1	1	1					1							
c16		1	1					1							
c17	1	1	1					1						1	
c18	1										1		1	1	
c19	1										1		1		
Σ	14	6	6	8	7	7	9	8	9	8	11	6	9	6	2

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	10
	Tutorials	3 Assignments per semester	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Communications (2) “Theoretical part”
- Communications (2) “Practical part”

7-2 Required books

- G-Miao, Signal Processing in Digital Communications, Arlech House, 2007.
- J. Minkoff, Signal Processing Fundamentals and Applications for Communications and Sensing systems, Alech-House, 2002.

7-3 Recommended books

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

7-4 Recommended Web Site

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

<https://www.slideshare.net/lineking/digital-communication-system>

8- Facilities required for teaching and learning:

- Analog and Digital Communication Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Nelly Muhammad Hussain

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn323: Electromagnetic Field Theory

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: August, 2020

B - Basic Information

Title: Microwave Engineering **Code:** ELCn323 **Level:** 3rd Fall
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 3 **Practical:** 0
Pre-requisite: PHYn002

C - Professional information

1 – Course Learning Objectives:

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

- Understand the basic concept of static force, field, potential, energy and capacitance.
- Solution of electrostatic problems by image methods, and Laplace equations by applying boundary conditions.
- Understand the basic concept of static magnetic field, force, circuits, and inductance.
- Understand the basic concept of time-varying field and Maxwell's Equations.
- Understand the basic concept of uniform plane wave.

2 – Competencies

- c1. Review the relevant topics in mathematics (vector analysis, coordinate systems, and vector calculus) (C1, C5).
- c2. Identify the behavior of electric field, magnetic field and time-varying field in the free space and material space (C1, C2, C10).
- c3. Understand the different theories and laws in the area of electrostatic field (Coulomb's law, Gauss's law, Potential's law, image method, Laplace and Poisson equations, etc.).. (C1, C10).
- c4. Understand the different theories and laws in the areas of magneto static field (Ampere's law, Biot-Savard's law, potential vector, etc.) (C1, C3, C10).
- c5. Understand the different theories and laws in the areas of time varying field and its behavior in different mediums. (C1, C10).
- c6. Deduce the different analogy between electrostatic field and magneto static field. (C12, C13).
- c7. Deduce the different forms of the Maxwell's equations (C12, C13).
- c8. Develop the different boundary conditions relations controlling the propagation of EM wave through different mediums (C13, C14).
- c9. Develop the behavior of the plane wave in different mediums (C14, C15).
- c10. Solve different types of Electrostatic boundary value problems (C13, C14).
- c11. Solve different types of magneto static field problems to calculate: magnetic field, magnetic force, and magnetic potential vector (C12, C13).
- c12. Solve the Maxwell's equations to derive the wave equation in different mediums (C13, C15).
- c13. Solve the plane wave equations to find the fields and its main properties (C12, C13).
- c14. Demonstrate practical application of electric and magnetic fields (C5, C10, C12, C13, C14).
- c15. Acquire and apply new knowledge; and practice self-learning strategies. (C10)

This course contributes in the following program competencies: **C1, C2, C3, C5, C10, C12, C13, C14 & C15**

3. Contents

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	Revision on Vector analysis, Coordinate systems, vector calculus revision Electrostatic Field in Free Space Coulomb's law and field intensity, Electric potential	3	6	-
2	Electrostatic Field in Free Space Electric field due to continuous charge distribution, Electric Dipole	3	4	-
3	Gauss's law and its applications Energy density in electrostatic fields	3	6	-
4	Image method in the case of: A charge in front of an Infinite grounded surface A charge in front of two orthogonal infinite grounded surfaces A Charge in front of grounded sphere	2	4	-
5	Electrostatic Boundary value Problems Curl & Divergence of Electric field Laplace & Poisson's equations Solution of Laplace's equation in Cartesian coordinates	2	4	-
6	Electrostatic Boundary value Problems Solution of Laplace's equation in cylindrical coordinates Solution of Laplace's equation in spherical coordinates	2	4	-
7	Assessment (Mid- Term)	-	-	-
8	Electrostatic Field in Material Space Properties of materials Convection and conduction currents Electric field in conductors Resistance, capacitance calculation Boundary conditions of 2 dielectric materials and 2 conducting materials	3	6	-
9	Magneto static Fields Static fields analogy Ampere circuital law Biot Savart law Curl & Divergence of magnetic field	3	6	-
10	Magneto Static Field Magnetic vector of potential A Boundary condition between two magnetic media The magnetic force	2	4	-
11	Time Varying Field	2	4	-
12	Maxwell's equations solution	2	4	-
13	Plane wave equation	1	2	-
14	Velocity of electromagnetic wave in free space Penetration depth in conductors	1	2	-
15	Revision	1	2	-
Total hours		30	45	-

4. Course content/Course Competencies mapping matrix:

Topic	Course Competencies														
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15
Vector analysis, coordinate systems, vector calculus revision Electrostatic Field in Free Space Coulomb's law and field intensity Electric potential	1	1													1
Electric field due to continuous charge distribution, Electric Dipole	1	1	1												1
Gauss's law and its applications Energy density in electrostatic field	1	1	1												1
Image method in solving Electrostatic Boundary value Problems	1	1	1												1
Curl & Divergence of Electric field Laplace & Poisson's equations Electrostatic Boundary value Problems Solution of Laplace's equation in Cartesian coordinates	1	1	1							1					1
Solution of Laplace's equation in cylindrical coordinates Solution of Laplace's equation in spherical coordinates			1							1					1
Electrostatic Field in Material Space Properties of materials Convection and conduction currents Electric field in conductors Resistance, capacitance calculation Boundary conditions of 2 dielectric materials and 2 conducting materials	1	1	1					1							
Magneto static Fields Static fields analogy Ampere circuital law Biot Savart law Curl & Divergence of magnetic field	1	1		1		1					1				1
Magneto Static Field Magnetic vector of potential A Boundary condition between two magnetic media The magnetic force	1	1		1				1			1				
Time Varying Field Maxwell's equations solution	1	1			1		1		1		1			1	1
Plane wave equation Velocity of electromagnetic wave in free space Penetration depth in conductors	1	1			1		1		1		1			1	1
Topics Covering Competencies	10	10	6	2	2	1	2	2	2	2	2	2	2	2	9

4 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1			1				1				1			
c2		1		1				1		1		1			
c3	1			1				1		1	1	1			
c4		1		1				1		1	1	1			
c5	1							1		1					
c6		1		1			1			1	1	1			
c7	1						1			1					
c8		1		1			1			1	1	1			
c9	1						1			1					
c10		1		1			1			1	1	1			
c11	1						1			1					
c12		1		1			1			1	1	1			
c13	1									1					
c14		1		1				1		1	1	1			
c15	1							1							
Σ	8	7		9			7	7		10	9		9		

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	4 Quizzes (one each 4 weeks)	20
	Tutorials	4 Assignments per semester	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes

Electromagnetic Field Theory.

7-2 Required books

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

7-3 Recommended books:

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

7.4 Periodicals, Web sites, etc.

- <https://en.wikipedia.org/wiki/Electromagn>
- <http://www.britannica.com/science/electro>
- <http://nptel.ac.in/courses/108106073/>
- [youtube](#)

Lec 1 https://youtu.be/TWjw_9ef4k0	Lec 2 https://youtu.be/IYWs9vulowY
Lec 3 https://youtu.be/PMTu_gjzSOM	Lec 4 https://youtu.be/l_VlcVtyPyo
Lec 5 https://youtu.be/HiDs4641rmc	Lec 6 https://youtu.be/fmVIMN79aBE
Lec 7 https://youtu.be/n1FtXxenfog	Lec 8 https://youtu.be/B8GT-k2BVSU
Lec 9 https://youtu.be/ccB87B4M79w	Lec 10 https://youtu.be/SG3bew26jbQ

8- Facilities required for teaching and learning:

Lecture, Data show and Computer lab

Course coordinator: Dr. Ibrahim Amin Ibrahim
Head of the Department: Prof. Dr. Shouman S. El.
Date: August, 2020

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: August, 2020

B - Basic Information

Title: Microprocessor Based Systems **Code:** **Level:** 3rd Fall & Spring
CMPn310
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: CMPn111

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (based on the knowledge, skills and personal attitudes) related to constructions and operations of microprocessors (like X-86 intel family) and microcontrollers (like MCS-51 and AVR). 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 – Competencies

On successful completion of this course, the students must be able to:

- c1. Identify the internal architecture, basic features of the selected microprocessors. (C1)
- c2. Identify the memory types, the addressing modes and the basic interfaces of the selected microprocessor (C1, C3)
- c3. Explain and formulate engineering problems using assembly language and embedded high-level language. (C2, C4)
- c4. Design and implement: modules, subsystems or systems in electrical/electronic/digital engineering using professional tools (likes MikroC tools). (C11, C5)
- c5. Manipulate the instruction set of the microprocessor to convert the assembly language to its machine code that will be burned into the program memory of the system. (C12, C13)
- c6. Recognize the uptodate modules and kits those can be interfaced with the microcontrolles like GPS, GSM, GPRS and IMU (C5).
- c7. Investigate and find solutions based on unconventional thinking and use the latest technology to investigate physical problems (C5).
- c8. Communicate effectively through using the contemporary tools for performing small projects besides researching the required reports (C5, C8)
- c9. Solve limited electromechanical tasks through control different motors (like servo motors, dc motors and stepper motors) based on programming the selected microcontroller (C3)

This course contributes in the following competencies: **C1, C2, C3, C4, C5, C8, C13, C14 & C15**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	The internal architectures of the considered microprocessors	1	1	2
2	The memories types and their addressing modes besides the basic interface of the considered microprocessors.	2	1	2
3	The machine cycles, delay times of the considered microprocessors.	3	2	3
4	The assembly (data transfer, logical, arithmetic, branching) instructions	2	2	5
5	The timers and counters that used by the microprocessors	3	2	3
6	The seial interfacing with the considered microprocessors	3	1	3
7	Midterm	2	1	--
8	The concept of the interrupt for the considered microprocessors	3	1	3
9	Interfacing between microcontroller and modules like GPS	3	1	
10	Controlling the stepper and servo motors using the microcontroller	2	1	2
11	Explaining the MikroC program to interface with different modules like LCD.	2	1	2
12	Recognizing the uptodate microprocessors like i9 Solving and designing some real applications based on microcontroller	1	-	1
13		1	1	1
14		1	-	1
15		1	-	1
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	c1	c2	c3	c4	c5	c6	c7	c8	c9
The internal architectures of the considered microprocessors	1				1				
The memories types and their addressing modes besides the basic interface of the considered microprocessors.	1	1			1				
The machine cycles, delay times of the considered microprocessors.	1				1		1		
The assembly (data transfer, logical, arithmetic, branching) instructions	1		1	1	1	1	1		1
The timers and counters that used by the microprocessors	1			1			1		
The seial interfacing with the considered microprocessors			1	1		1	1		
The concept of the interrupt for the considered microprocessors				1	1	1	1		
Interfacing between microcontroller and modules like GPS			1	1	1	1	1	1	
Controlling the stepper and servo motors using the microcontroller			1	1	1	1	1		1

Explaining the MikroC program to interface with different modules like LCD.			1	1		1	1		1
Recognizing the uptodate microprocessors like i9	1	1						1	
Solving and designing some real applications based on microcontroller	1	1	1	1	1	1	1	1	1
Topics Covering Competences	7	3	6	8	8	7	9	3	4

5 - Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1	1		
c4	1	1		1	1	1			1	1	1	1		1	
c5	1	1		1	1	1				1	1	1	1	1	
c6	1	1	1	1		1	1		1	1	1	1	1		
c7	1	1	1				1	1		1	1		1	1	
c8	1	1	1				1	1					1	1	
c9	1	1	1		1		1	1	1					1	
Σ	9	9	4	6	5	6	4	3	4	7	7	6	6	5	

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Practical exam		12 th Week	20
Semester Work	Quizzes	1 Quiz	20
	Reports/Research	1 report per semester	
	Tutorials	1 Assignment	
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

Lecture notes and handouts

- Assem B, (2018) The Microprocessor Based Systems: lecture note, Modern academy Laboratory work printed notes
- Assem B, (2018) The Microprocessor Based Systems: Laboratory note, Modern academy

7-2 Required books

Rolin D. McKinlay, Janice G. Mazidi, Danny Causey and Muhammad Ali Mazidi, (2012) The 8051 Microcontroller: Prentice Hall.

7-3 Recommended books:

- Valvano, (2012) Embedded microcomputer system real time interfacing: Cengage Learning.
- Sampath k. venkatesh, (2013) 8051 microcontroller & embedded systems: katson.

7-4 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/>

8- Facilities required for teaching and learning:

- Computer Lab. equipped with Data show and Computer package
- Lecture and Exercise rooms equipped with Data show projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Assem Badr

Head of the Department:

Dr. Abd Elmoneim Fouda

Date:

August, 2020

Modern Academy
for Engineering and Technology in Maadi



Course Specification ELCn361: Project1

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 BSc Program
Date of specifications approval: August, 2020

B - Basic Information

Title: Project 1 **Code:** ELCn361 **Level:** 3rd Fall
Credit Hours: 2 **Lectures:** 1 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: 99 credits + ELCn213

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to the design and operation of the basic analogue and digital transceiver communication systems such as AM, FM, PAM and PWM, ASK, and FSK transceivers. They should compete on the design, implement, calculate, operate, maintain and analyze the performance of these systems and their basic components. To perform these tasks the students must also know: to design different types of amplifiers, oscillators and ADC and DAC circuits.

2 – Competencies

- c1- Design and implement the engineering knowledge and learned techniques to achieve the proper design. (C1, C2, C3, C6, C5, C16, C17, C18)
- c2- Study and analysis the characteristics of Common Emitter Amplifier and Design of its circuit (C1, C2, C3, C5, C6, C5, C16, C17, C18)
- c3- Analyse the characteristics of amplifier using BJT then Design, Implement and measure these characteristics of amplifiers using BJT and op-amp ICs (C12, C13, C14, C15, C17)
- c4-. Design the amplifier circuits for simple applications, then carry out the necessary calculations, specify and select the system components. Assemble and operate the amplifier circuits (C1, C2, C3, C5, C6, C5, C16, C17, C18)
- c5- Analyze the characteristic of Class A power amplifier then Implement the design and measure the characteristic of Class A power amplifier. (C11, C12, C13, C14, C15, C17, C18)
- c6- Study and analysis the characteristics of different types of Oscillators and comparison between them
- c7- Design, Implement and measure the output frequency of different types of Oscillators (C1, C12, C15, C17, C18)
- c8- Design and Implement ADC & DAC circuits (C12, C15, C17, C18)
- c9- Implement the design of basic analogue and digital communication transceivers (C2, C3, C12, C14, C16, C15, C17, C18)
- c10-Use computer software; protosoft software, matlab software and other available programs to design, calculate, simulate or animate analog and digital communication transceivers systems and their components (C2, C11, C16, C17, C18).
- c11- Simulate these circuits and test them in labs. (C7)
- c12- Work individually or in groups and communicate effectively under stressful environment and within constraints. (C4, C5, C7)

- c13- Present and discuss the final project results in order to be approved by the leader and make final practical exam in projects lab. (C4, C5, C7, C8, C9, C13, C14)
 c14- Manage tasks, time, and resources effectively (C6, C10)

This course contributes in the following program competencies: **C2, C4, C5, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Introduction to the project 1 course	1	1	2
	Introduction of Design Analog and Digital Transceiver			
2	Analysis the characteristics of Common Emitter Amplifier and Design of its circuit	1	1	2
3	Analyse and Design the characteristics of amplifier using BJT	1	1	2
4	Class A power amplifier	1	1	2
	➤ Classification, operation, Design, analysis basic of characteristics			
5	Study and analysis the characteristics of different types of oscillators	1	1	2
	➤ Design and analysis Non-Sinusoidal oscillators			
	➤ 555 IC, A-stable, Mono-stable			
6	Design and analysis different types of oscillators	1	1	2
	➤ Sinusoidal RC oscillators			
7	Assessment (Mid- Term)	-	-	-
8	Design and analysis Sinusoidal LC oscillators	1	1	2
9	Design and analysis basic analog transceiver system	1	1	2
	➤ design AM and FM			
	➤ design PAM and PWM			
10	Design basic and analysis digital transceiver system	1	1	2
	➤ ASK and FSK			
11	Design and analysis ADC and DAC	1	1	2
12	Final project with final report, design and analysis of the transceiver system	1	1	2
13	Revision	2	2	3
14	Revision	1	1	3
15	Revision	1	1	2
Total hours		15	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14
Introduction to the project 1 course	1													
Introduction of Design Analog and Digital Transceiver	1													
Design, Common Emitter Amplifier CE	1	1	1	1			1			1	1	1	1	1
Design and analysis amplifier using BJT	1	1	1	1						1	1	1	1	1
Design and analysis class A power amplifier	1			1	1					1	1		1	1
Design and analysis different types of oscillators Non-Sinusoidal oscillators Multi vibrator	1					1	1			1	1	1	1	1
555 IC (A-stable - Mono-stable)	1					1	1	1		1	1	1	1	1
Design and analysis different types of oscillators Sinusoidal (RC, LC) oscillators	1					1	1	1		1	1	1	1	1
Design and analysis basic analog transceiver system AM and FM	1	1							1	1	1	1	1	1
Design and analysis basic analog transceiver system PAM and PWM	1	1		1			1	1	1	1	1	1	1	1
Design basic and analysis digital transceiver system ASK and FSK	1			1			1	1	1	1	1	1	1	1
Design and analysis ADC and DAC	1						1	1	1	1	1	1	1	1
Final assignment and final project		1	1	1	1	1	1	1	1	1	1		1	1
Topics Covering Competences	10	5	3	5	2	3	7	5	5	9	9	8	10	10

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods				Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Design circuits and simulation	Tutorials	Practical Exam	Lecture Assignments	Research & Presentations	Final Project	Report/Oral discussion
c1	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					
c5	1	1		1	1	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			
c8	1	1		1	1	1	1			1	1					
c9	1	1	1	1	1	1		1	1	1			1			
c10	1	1		1	1		1	1	1	1	1		1			
c11	1		1	1	1	1		1			1		1	1		
c12		1	1			1	1	1	1	1	1			1	1	1
c13	1	1	1			1	1	1	1				1	1	1	1
c14		1	1				1	1	1	1			1	1	1	1
Σ	10	10	9	9	7	10	10	10	10	10	10	0	10	4	3	

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	0
Semester Work	Lecture Assignments	8 Assignments (one each week)	20
	Hardware implementation circuits	Design 5 circuits and test them in projects lab Bi-Weekly	20
	Software implementation	Simulation /reports Bi-Weekly	5
	Tutorials	Seminars, Quizzes one per semester	5
	Final project	Once per semester	10
Practical Exam		Fifteenth week	0
Oral Final Exam and Presentation		Sixteenth week	40
Technical report (Final Assignment)		Sixteenth week	
Total			100

7- List of references:

Course notes: project 1 note "Practical part book"

7-2 Required books itchell A. Thornton, *Serie*

7-3 Recommended books: None

Sedra-Smith, Microelectronics Circuits -6th ed., Oxford University Press, 2009.

Jacob Millman, Microelectronics-9th ed, McGraw Hill series Jacob Milman, 2012.

Ferdinand Haverman Mitchell, Introduction to Electronics Design- 2nded, Prentice Hall;1991

Fundamentals of Electronics Book 1 Electronic Devices and Circuit Applications, Mitchell A.thornton, Southern Methodist Universit

7-4 Periodicals, Web sites, etc.

https://learnabout-electronics.org/Semiconductors/bjt_06.php

<https://learnabout-electronics.org/Oscillators/osc10.php>

<https://www.electronicsforu.com/electronics-projects/simple-fm-receiver>

www.allaboutcircuits.com

8- Facilities required for teaching and learning:

- Project Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- Computer, Data show and Computer programs; Installed with MATLAB and Orcad programs and protuse simulation software
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Maha Gaber Ahmed

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

Date: August, 2020

Modern Academy

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Course Specification

ENGN312a: القوانين الهندسية والأخلاق المهنية

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:

August 2020

B - Basic Information

Title: القوانين الهندسية والأخلاق المهنية

Code: ENGN312a Level: 3rd and 4th Fall and Spring

Credit Hours: 2

Lectures: 2

Tutorial/Exercise: -

Practical: -

Pre-requisite: None

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 والعقود الهندسية. وتهدف الدورة أيضاً إلى دراسة التدريب وقوانين النقابات ، مع التأكيد على أهمية تحقيق أخلاقيات المهنة ومبادئها من خلال تقديم مقدمة لها وايضا علامات اكتساب تلك الاخلاقيات وكيفية ترسيخها وتنميتها. كما يتطرق الي تخصيص مهنة الهندسه باختلاف تخصصاتها على انها من المهن الحساسه والدقيقه لاحتياجها الي الاخلاقيات المهنية.

2 – Competencies

- c1- (C4, C8) يدرس منهجيات حل المشاكل الهندسية ، وجمع البيانات وتفسيرها
- c2- (C9, C10) يتعرف نظم ضمان الجودة ، ومدونات الممارسات والمعايير ومتطلبات الأمن الصناعي والقضايا البيئية
- c3- (C4) يربط بين أخلاقيات المهنة والآثار المترتبة على الحلول الهندسية على المجتمع والبيئي.
- c4- (C10) يجيد اللغة وكتابة التقارير الهندسية
- c5- (C9) يفكر بطريقة خلاقية ومبتكرة في حل المشكلات القانونية والهندسية
- c6- (C2, C4) يدمج ويستبدل ويقيم مختلف الأفكار والآراء من وجه النظر القانونية والهندسية
- c7- (C3, C6, C7) يخطط ويجري يكتب التقارير والتكاليف عن المشروعات المختلفه
- c8- (C2, C6, C7, C9) يعرض ويحل أحد المشاكل القانونية في احد الشركات
- c9- Work in a team and involve in group discussion. (C2, C3, C7)
- c10- Search for information in references and in internet. (C5, C9)
- c11- Practice self-learning and communicate effectively orally and in written form. (C7, C8)

This course contributes in the following program competencies: C2, C3, C4, C5, C6, C7, C8, C9, C10

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ مصطلحات ومفاهيم قانونية	2		
2,3,4	➤ التشريعات الصناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمراني	6		
5	➤ قوانين وتشريعات بيئية لحماية البيئة المصرية	2		
6	➤ المناقصات والعطاءات. - قانون تنظيم المناقصات والعطاءات	2		
7	➤ امتحان منتصف الفصل	2		
8,9,	➤ العقود الهندسية المحلية - العقود الهندسية الدولية- المطالبات والتحكيم	4		
10,11,12	➤ القواعد واللوائح التي تتحكم في عمل المهندس ، وحقوقه وواجباته	6		
13,14,15	➤ دراسة التدريب وقوانين النقابات ، مع التأكيد على أهمية تحقيق أخلاقيات المهنة ومبادئها من خلال تقديم مقدمة لها وتخصيص مهنة المهندس بجميع تخصصاتها في دراسة وترسيخ اخلاقيات المهنة.	6		
Total Hours		30		

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies										
	c1	c2	c3	c4	c5	c6	c7	C8	C9	c10	c11
مصطلحات ومفاهيم قانونية	1			1	1	1	1	1	1	1	1
التشريعات الصناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمراني	1	1	1	1	1	1	1	1	1	1	1
قوانين وتشريعات بيئية لحماية البيئة المصرية	1	1	1	1	1	1	1	1	1	1	1
المناقصات والعطاءات. - قانون تنظيم المناقصات والعطاءات	1	1		1	1	1	1	1	1	1	1
العقود الهندسية المحلية - العقود الهندسية الدولية- المطالبات والتحكيم	1	1		1	1	1	1	1	1	1	1
القواعد واللوائح التي تتحكم في عمل المهندس ، وحقوقه وواجباته	1	1	1	1	1	1	1	1	1	1	1
دراسة التدريب وقوانين النقابات ، مع التأكيد على أهمية تحقيق أخلاقيات المهنة ومبادئها من خلال تقديم مقدمة لها وتخصيص مهنة المهندس بجميع تخصصاتها في دراسة وترسيخ اخلاقيات المهنة.	1		1	1	1	1	1	1	1	1	1
Topics Covering Competences	7	5	4	7	7	7	7	7	7	7	7

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
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	1
c5	1	1			1	1	1	1
c6	1	1			1	1	1	1
c7	1	1			1	1	1	1
c8	1	1			1			
c9	1	1			1			
c10		1			1			
c11		1			1			
Σ	9	11	-	-	11	7	7	7

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Mid-Term Exam	7 th Week	20
Semester Work	Quizzes	5 th and 10 th
	Assignments/ Reports	Bi-2Weeks
Written Exam	Seventeenth week	40
Total		100

7- List of references:

7-1 Course notes:

د عبير حسن سراج الدين، قوانين وتشريعات هندسيه، الأكاديمية الحديثه للهندسة و التكنولوجيا، المعادى، 2019 .

7-2 Required books:

7-3 Recommended books:

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

7-4 Periodicals, Web sites, etc.

www.alamiria.com

8- Facilities required for teaching and learning:

- Library.
- Internet.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Abeer Serag El-Deen

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy
for Engineering and Technology in Maadi



Course Specification
GENn351a: Technical English

A- Affiliation

Relevant program: Electronics and Communication BSc program Technology Department
Department offering the program: Electronics and Communication BSc program Technology Department
Department offering the course: Electronics and Communication technology Department
Date of specifications approval: August, 2020

B - Basic information

Title: Technical English Language **Code:** GENn351a **Level:** 3th
Credit Hours: 2 **Lectures:**2 **Tutorial:** **Practical:**
Pre-requisite: - GENn042

C - Professional information

1 – Course Learning Objectives:

This course is designed to help students to concentrate on grammatical structures especially those used in scientific language. Students will be introduced to vocabulary of scientific English that is related to electronics and Communication engineering and develop their understanding and application of it. Also, this course focuses on techniques for writing the essential elements of technical report: Abstract – Summary – table of contents – writing conclusions and recommendations – wiring references. The course includes some research and how to criticize technical papers in the field of electronics and Communication engineering.

2 – Competencies

- c1- Develop the vocabulary of students in their field of specialization. (C5)
- c2- Develop understanding and application of reading skills. (C8)
- c3- Enable students to practice the language functions commonly used in English. (C10)
- c4- Develop students' mastery of such essential reading skills as using reference locating information, distinguishing major and minor points, and finding main theme of a text . (C10)
- c5- Develop students' ability to communicate information with their peers. (C10)
- c6- Employ tasks which encourage students to take an active role in learning and using new vocabulary. (C9)
- c7- Understand terminology related to the engineering fields.(C8)
- c 8- Enhance class interaction in terms of speaking, reading, and writing.(C2), (C8)
- c 9- Use English in an engineering environment.(C8)
- c 10- Describe technical functions and applications. (C8)
- c 11- Personalize the learning experience by offering students interesting topics relevant to their interests and experiences. (C8)
- c12- Work in a team and involve in group discussion. (C1), (C8)
- c13- Communicate effectively and present data and results orally and in written form. (C8, C10)
- c14- Improve specialist language knowledge of electronics and communication engineers.(C8)
- c15- Search for information in references and in internet. (C10)
- c16- Employ tasks which encourage students to take an active role in learning new vocabulary, related to their field of specialization. (C10)

This course contributes in the following program competencies:**C1, C2, C5, C8, C9, C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Common vocabulary in electronics and communications engineering	2		
2	Describing effective reading	2		
3	How to summarize a technical article in the field.	2		
4	Technical terminologies and jargons.	2		
5	How to technically criticize a technical article.	2		
6	Some practice exercises	2		
7	Mid-Term Exam	2		
8	Technical writing guidelines	2		
9	How to write an effective Abstract and Summary	2		
10	How to write an effective Body	2		
11	How to write an effective results	2		
12	How to write an reference and table of contents	2		
13	Some practice exercises	2		
14	Reading a technical article and then re-writing it using your point of view.	2		
15	Some practice exercise.	2		
Total hours		30		

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies															
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16
Common vocabulary in electronics and communications engineering	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Describing effective reading	1	1	1	1	1	1	1		1	1	1		1	1	1	1
How to summarize technical articles in the field.	1	1	1	1	1	1	1		1	1	1		1	1	1	1
Technical terminologies and jargons	1	1	1		1	1	1		1	1	1		1		1	1
How to technically criticize a technical article.	1	1	1	1	1		1		1	1		1		1	1	
Some practice exercises	1	1	1	1	1	1	1		1	1		1	1		1	
Mid-Term Exam	1		1			1	1			1						1
Technical writing guidelines	1	1	1	1	1		1	1		1	1	1	1	1	1	
How to write an effective Abstract and Summary	1	1	1		1	1	1	1		1		1		1	1	
How to write an effective Body	1	1	1		1	1		1		1	1		1	1		1
How to write an effective results	1	1	1	1	1	1		1		1		1			1	
How to write an reference and table of contents	1	1	1	1	1		1		1	1	1	1	1	1		1
Some practice exercises	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1
Reading a technical article and then re-writing it using your point of view.	1			1			1		1			1			1	
Some practice exercises	1				1		1		1	1			1			1
Topics Covering Competences	15	12	13	11	13	10	12	6	11	14	8	9	10	9	11	9

5- Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1		1				1			1			1		1
c2	1							1							
c3	1						1			1			1	1	1
c4	1		1					1							
c5	1							1						1	1
c6	1														
c7	1		1					1		1			1	1	1
c8	1						1							1	1
c9	1						1	1						1	
c10	1		1											1	1
c11	1		1				1	1							
c12	1						1	1						1	
c13	1		1				1							1	
c14	1		1				1	1						1	
c15	1						1	1						1	
c16	1						1	1						1	
Σ	16		7				10	10		3			3	11	6

6- Assessment Timing and Grading:

Assesment Method	Timing	Grade (Degrees)
Assignments and Reports	Bi-Weekly	20
Two Quizzes	5 th and 10 th	20
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes:

7-2 Required books

Shelton, James, Handbook for Technical English, NTC publishing Group, Illinois, USA, 1998.
Raymond MurPHY, (2012), "English Grammar in Use. Cambridge", Cambridge University Press.

7-3 Recommended books: Non

7-4 Periodicals, Web sites, etc.:

- <http://www.bbc.co.uk/learningenglish>
- <http://www.rong-chang.com/>
- <http://legacy.australiannetwork.com/studyenglish/>

8- Facilities required for teaching and learning: Library and Internet

Course coordinator:

Dr. Refaat Mohamed

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification GENn352: Risk Management

A- Affiliation

Relevant program:

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

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Risk Management

Code: GENn352

Level: 3rd, Fall

Credit Hours: 2

Lectures: 2

Tutorial/Exercise: -

Practical: -

Pre-requisite: None

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 – Competencies

- c1- Understand the basic concepts of risk assessment. (C4, C8)
- c2- Explain the basic concepts of hazards and risk factors. (C9, C10)
- c3 - Explain principles of rating the extent of potential harm and evaluating the likelihood that harm will occur. (C4)
- c4 - Classify and compare the principles of controlling the risks. (C10)
- c5 - Deciding priorities for action. (C2, C3)
- c6 - Analyze, strategies for managing the risks. (C2, C3)
- c7 - Apply Principles of strategic approaches for dealing with risks. (C2, C3)
- c8 - Relate general theory to specific contexts. (C9)
- c9 - Compare and analyze different risk situations and risk environments. (C2, C4)
- c10 - Select and use appropriate Strategies, methods and techniques for identifying, diagnosing and dealing with risks. (C3, C6, C7)
- c11 - Develop problem solving approaches and controlling the risk. (C2, C6, C7, C9)
- c12 - Enhance the ability to critically reflect on own and others' practice to improve own/others 'actions. (C2, C3, C7)
- c13 - Search for information and engage in life-long self-learning discipline. (C5, C9)
- c14 - Practice self-learning and communicate effectively orally and in written form. (C7, C8)

This course contributes in the following program competencies: **C2, C3, C4, C5, C6, C7, C8, C9 & C10**

3- Contents

Week	Topic	Lecture hours	Tutorial hours	Practical h
1	➤ Identify risk assessment, hazards, and risk factors	2	-	-
2,3	➤ Evaluating the hazards and risks.	4	-	-
4,5	➤ Rating the extent of potential harm, and the likelihood that harm will occur.	4	-	-
6	➤ Controlling the risks, Control measures.	4	-	-
7	➤ Mid team	2		
8	➤ Systems of control, Deciding priorities for action.	2	-	-
9,10	➤ Case study 1: health services, Case study 2: call centers.	4	-	-
11	➤ Case study 3: food production and processing, Case study 4: engineering and manufacture.	3	-	-
12	➤ Strategies for managing the risks, Planning, Range of strategic approaches for dealing with risks.	3	-	-
13,14,15	➤ Stakeholders and spreading the risks, and Policies.	2	-	-
Total		30		

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	C8	C9	c10	c11	c12	c13	c14
Identify risk assessment, hazards, and risk factors	1	1	1	1				1		1			1	1
Evaluating the hazards and risks.	1	1	1	1	1	1	1	1	1	1	1		1	1
Rating the extent of potential harm, and the likelihood that harm will occur.	1	1	1	1	1	1	1	1	1	1	1		1	1
Controlling the risks, Control measures.	1	1	1	1	1	1	1	1	1	1	1		1	1
Systems of control, Deciding priorities for action.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Case study 1: health services, Case study 2: call centers.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Case study 3: food production and processing, Case study 4: engineering and manufacture.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Strategies for managing the risks, Planning, Range of strategic approaches for dealing with risks.	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Stakeholders and spreading the risks, and Policies.	1	1	1	1	1	1	1	1	1	1	1		1	1
Topics Covering Competences	9	9	9	9	8	8	8	9	8	9	8	4	9	9

5 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competences	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
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	1
c5	1	1			1	1	1	1
c6	1	1			1	1	1	1
c7	1	1			1	1	1	1
c8	1	1			1	1	1	1
c9	1	1			1	1	1	1
c10	1	1			1			
c11	1	1			1			
c12	1	1			1			
c13		1			1			
c14	1	1			1	1	1	1
Σ	13	14			14	10	10	10

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	5 th and 10 th	20
	Assignments/ Reports	Bi- Weekly	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-5 Course notes:

Risk Management.

7-4 Required books:

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

7-5 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

7-4 Periodicals, Web sites, etc.

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

<http://www.freebookcentre.net/>

8- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Library.
- Internet.

Course coordinator:

Dr. Nagat A. Elmahdy

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification GENn353 Industrial Psychology

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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Manufacturing Engineering and Production Technology Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Industrial Psychology

Code:

GENn353a

Level: Seventh Semester (Level three)

Credit Hours: 2

Lectures: 2

Tutorial/Exercise: 0

Practical: 0

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to improve the performance of the whole work system as well to reduce the stress imposed on the working human being in industry.

2 - Competencies

- c1. Identify the role of the role of industrial engineer (C4).
- c2. Learn the structural system of human work (C4, C6).
- c3. Learn the physical environmental impacts on human beings which can be assessed quantitatively (C4, C6)
- c4. Use appropriate techniques on basics of ergonomics to instrument display, machine, control and lay out of workplace (C4, C5, C6)
- c5. Consider effect of all environmental changes on equipment (C3)
- c6. Diminishing the effects of physical environmental impacts on human beings (C3, C4)
- c7. Utilize and make the best use of human abilities (C10)
- c8. Acquire and apply new knowledge to new product design adapted to the customer. (C5, C6)
- c9. Practice using ergonomic factors in domestic and industrial products (C4, C5, C6)
- c10. Collaborate effectively within multidisciplinary team (C5, C7, C9).
- c11. Practice self-learning and communicate effectively orally and in written form (C8, C10).

This course contributes in the following program competencies: **C3, C4, C5, C7, C8, C9, C10**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Industrial Design - Design concepts	2		
2	Ergonomics	2		
3	Application of ergonomics - Instruments - Controls - Work place.	2		
4	Aesthetic and ergonomics coordination	2		
5	Working condition and Environment	2		
6	Heating and Ventilation	2		
7	Assessment (Mid)Term)			
8	Assessment (Mid Term Exam)	2		
9	Local Ventilation - Industrial Ventilation	2		
10	Air condition systems - CFC'S - Ozone	2		
11	Depletion and Global Warning	2		
	Noise - Exposure to noise - Noise control	2		
12	Technique - Vibration	2		
13	Lighting - Level of luminance - Factors	2		
14	Affecting the quality of lighting	2		
15	Human effectiveness	1		
	Revision	1		
Total hours		30		

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies										
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11
Industrial Design - Design concepts	1								1		1
Ergonomics	1			1		1			1	1	1
Application of ergonomics - Instruments - Controls - Work place.	1	1		1		1			1		
Aesthetic and ergonomics coordination		1		1		1		1			
Working condition and Environment		1	1	1	1	1					1
Heating and Ventilation			1	1	1	1					
Local Ventilation - Industrial Ventilation			1	1		1		1			
Air condition systems - CFC'S - Ozone			1	1	1	1					
Depletion and Global Warning			1	1		1					
Noise - Exposure to noise - Noise control			1	1		1		1			
Technique - Vibration			1	1		1					
Lighting - Level of luminance - Factors			1	1		1					
Affecting the quality of lighting			1	1		1		1			
Human effectiveness		1	1			1	1			1	1
Topics Covering Competencies	3	4	10	12	3	13	1	4	3	2	4

5 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method				
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations
c1	1	1	1							1			1	
c2	1	1	1							1			1	
c3	1		1							1			1	
c4	1	1								1			1	
c5	1									1			1	
c6	1									1			1	
c7	1									1			1	
c8	1									1			1	
c9	1									1			1	
c10			1					1						
c11			1					1						
∑	9	3	5	0	0	0	0	2	0	9	0	0	9	0

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Mid-Term Exam	7 th Week	20
Semester Work	Quizzes	2 Quizzes per semester
	Reports	4 reports per semester
Mini-project case study research	Fifteenth week	10
Written Exam	Sixteenth week	40
Total		100

7 – List of references:

- **Course notes:** None
- **Required books:** None

7-1 Recommended books:

- Levy, Paul. Industrial/organizational psychology. Macmillan, 2009.
- Pheasant, Stephen, and Christine M. Haslegrave. Bodyspace: Anthropometry, ergonomics and the design of work. CRC press, 2018.

7-4 Periodicals, Web sites, etc. None

8 – Facilities required for teaching and learning:

- **Lectures room equipped with OHP and data show facility.**
- **Library.**
- **Internet.**

Course coordinator: Prof. Mamdouh Saber
Head of the Department: Dr. Metwally Abd Elghaffar
Date: August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn320: 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:	August, 2020

B - Basic Information

Title: Control-2(Digital and PLC Control)	Code: ELCn320	Level: 3 rd Spring	
Credit Hours: 4	Lectures: 3	Tutorial/Exercise:1	Practical: 2
	Pre-requisite: ELCn210		

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to the analysis and design of discrete time / digital control systems and their basic elements. They should compete on the analysis, calculate, design, maintain and analyze the performance of discrete time/digital systems and their basic components.

2 – Competencies

- c1. Ability to apply knowledge of basic science and engineering fundamentals (C1, C3).
- c2. Explain the construction, operation and specification of the basic discrete time control systems (C2,C12).
- c3. Explain the theoretical background needed to calculate and analyze the discrete system characteristics (C17).
- c4. Perform z-transform for a digital control system and interpret the fundamentals of z-transform (C1).
- c5. Explain the theoretical background needed to map between s-plane and z-plane and the bilinear transformation (C9).
- c6. Derive transfer function for a digital control system and analyze its stability and steady state error property (C12).
- c7. Deduce mathematical relations describing the steady state performance of discrete time systems (C1).
- c8. Apply fundamental state-space-techniques in the analysis and design of linear feedback control systems, as they arise in a variety of contexts (C13).
- c9. Use state-space methods to model a digital control system and analyze its properties such as controllability and observability (C15).
- c10. Formulate and solve problems for digital control systems by using manual and computerized methods (C17).
- c11. Use computer software tools to simulate, analyze, and design feedback controller and observers of automatic control systems in Matrix form (C17, C18).
- c12. Design appropriate digital state observers to meet certain performance specifications (C16).
- c13. Explain the construction, operation and specification of the Programmable Logic Controllers (PLC) (C15,C16).
- c14. Use PLC computer software tools to design and control PLC scienrios for different industrial processes (C16, C17).
- c15. Ability to undertake problem identification, formulation and solution (C5).
- c16. Ability to communicate effectively, with the engineering team and with the community at large teams, with the capacity to be a leader or manager as well as an effective team member (C8,C7).
- c17. Consider the impact of designs on the environmental protection (C3).
- c18. Practice self-learning and communicate effectively orally and in written form (C8,C10).

This course contributes in the following program competencies: **C1, C2, C3, C5, C7, C8, C9, C10, C11, C12, C13, C15, C16, C17, C18**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	1. Introduction to digital control systems	3	1	2
	2. Digital control system components, and applications			
2	3. The z transform and z-plane theory and properties.	3	1	2
	4. Z transform method for solving difference equations.			
3	5. Discrete time control systems signals, classifications.	3	1	2
	6. Mathematical representation of sampling process and zero order hold functionality.			
4	7. z-Plane analysis of discrete time control systems	3	1	2
	8. Mapping between the S Plane and the Z Plane			
	9. The pulse transfer function.			
5	10. Stability analysis of closed loop system in z-plane.	3	1	2
	11. Stability analysis by using bilinear transformation and Routh stability.			
6	12. Steady-state error analysis of discrete-time systems	3	1	2
	13. Transient response specifications			
7	Assessment (Mid- Term)	-	-	-
8	14. Design of Discrete-time control systems	3	1	2
	15. Solving discrete time state space systems.			
9	16. State Space representation to transfer function	3	1	2
	17. State Space model properties			
10	18. Controllability and observability analysis.	3	1	2
	19. Similarity transformation.			
11	20. State Feedback control design techniques.			
	21. State Feedback observers design techniques			
12	22. Introduction to Programmable Logic controller (PLC)	3	1	2
13	23. PLC I/O interfacing, programming	3	1	2
	24. Applications			
14	25. Mini project; design and analysis of a digital control system for an industrial application. Analysis of the possible operational problems...	3	1	2
15	Revision	6	2	4
Total hours		45	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competences																	
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18
Introduction to digital control systems	1																	
Digital control system components, and applications	1	1														1		
Discrete time control systems signals, classifications.	1	1	1															
Z transform method for solving difference equations	1			1												1		
Discrete time control systems signals, classifications.	1																	
Mathematical representation of sampling process and zero order hold functionality.	1	1	1													1		
z-Plane analysis of discrete time control systems and Mapping between the S Plane and the Z Plane	1			1	1	1												
The pulse transfer function.	1															1		
Stability analysis of closed loop system in z-plane and Bilinear Transformation	1				1	1	1											
Steady-state error analysis of discrete-time systems						1										1	1	
Transient response specifications	1															1		
Design of Discrete-time control systems and Solving discrete time state space systems.								1	1							1		
State Space representation to transfer function									1	1								
Controllability and observability analysis, similarity transformation									1	1	1	1				1		1
State Feedback control and observers design techniques											1	1				1		1
Introduction to Programmable Logic controller (PLC)	1												1	1	1	1		
PLC I/O interfacing, programming, and applications												1	1		1	1		1
Mini project						1	1	1	1		1	1	1	1		1	1	1
Topics Covering Competencies	12	3	2	2	3	4	4	2	4	2	4	4	3	2	4	12	2	4

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1	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		
c4	1	1		1						1	1				
c5	1	1		1				1		1	1		1		
c6	1	1		1	1					1	1		1		
c7	1	1		1		1				1	1		1		
c8	1	1	1	1		1	1			1	1		1	1	1
c9	1	1		1			1	1	1	1	1	1	1	1	1
c10	1	1		1	1					1	1		1	1	
c11	1	1		1		1		1		1	1	1	1		
c12	1			1		1	1	1		1	1				1
c13	1	1		1			1		1	1	1		1	1	1
c14		1		1	1		1	1		1	1	1		1	1
c15						1		1						1	
c16						1						1			
c17		1		1			1								1
c18			1					1				1		1	1
∑	13	13	2	14	3	8	6	9	2	14	14	5	10	8	8

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fourteenth week	20
Written Exam		Fifteenth week	40
Total			100

7- List of references:

7-1 Course notes: Digital Control & PLC

7-2 Required books

Katsuhiko Ogata. (1995) Discrete-time Control Systems, Prentice Hall International inc.

7-6 Recommended books:

M. Sami Fadali, Antonio Visioli (2013) Digital Control Engineering Analysis and Design, 2nd edition, Academic Press.

7-4 Periodicals, Web sites, etc.

- [https://www.controleng.com/magazine/ /](https://www.controleng.com/magazine/),(Last accessed March 2021)
- <https://www.journals.elsevier.com/control-engineering-practice>, (Last accessed March 2021)
- <https://www.journals.elsevier.com/automatica>, (Last accessed March 2021)
- <https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=9>,(Last accessed March 2021)

8- Facilities required for teaching and learning:

- Control Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- Software Computer lab, Data show.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Mohammed Alhawary
Head of the Department: Prof. Shouman Alshahat
Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn324: 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:	August 2020

B - Basic Information

Title: Microwave Engineering	Code: ELCn324	Level: 3 rd Spring	
Credit Hours: 4	Lectures: 3	Tutorial/Exercise:1	Practical: 2
	Pre-requisite: ELCn323		

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 and other techniques)

2 – Competencies

- c1. Derive the Basic equations of microwave field in case of propagation in free space and dielectric. (C1).
- c2. TE, TM mode analysis in rectangular and circular waveguides. (C1, C10).
- c3. Power calculation in waveguide systems considering conductor and dielectric losses (C3, C10).
- c4. Use Smith chart analysis and its application in transmission lines (C1, C3, C9).
- c5. Matching techniques using impedance transformers (binomial-Tshebyshev) (C3, C5, C10).
- c6. Basic microwave measurements (wavelength, VSWR, power and impedance) (C11, C18)
- c7. Identify the studied microwave transmission lines and waveguides (C12, C13).
- c8. Investigate how to improve the voltage standing wave ratio in microwave systems (C12, C13).
- c9. Deduce attenuation constant for typical microwave transmission systems (C11, C12, C13)
- c10. Deduce mathematical models for typical impedance transformers (C1, C10).
- c11. Construct, test and investigate the performance of typical microwave transmission systems (C12).
- c12. Design of matching circuit for a given load using design equations and CAD (C18).
- c13. Design of waveguide or coaxial line for given frequency band and power using design equations or CAD (C18).
- c14. Search for information from references, journals, and internet (C5, C9).
- c15. Effectively manage tasks, time, and resources (C5, C9).

This course contributes in the following program competencies: **C1, C3, C5, C8, C9, C10, C11, C12, C13, C14, C17 & C18**

3. Contents

Topics	Lecture hours	Tutorial hours	Practical hours
1-Plane wave reflection from a media interface (parallel and perpendicular polarization).	9	2	4
2- Rectangular and circular waveguides TE, TM modes (analysis – design and applications).	9	3	6
3- Coaxial line and micro strip line (low – frequency and high – frequency solutions)	7	3	6
4-Attenuation due to conductor and dielectric loss.	5	2	4
5- Field analysis of transmission lines (traveling and standing waves).	6	2	5
6-Smith chart and impedance matching (single stub, double stub tuners and other matching techniques).	9	3	5
Total hours	45	15	30

4. Course content/Course Competencies mapping matrix:

Topics	Competencies														
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15
1- Plane wave reflection from a media interface (parallel and perpendicular polarization).	1					1	1				1				
2- Rectangular and circular waveguides TE, TM modes (analysis – design and applications).		1	1			1	1	1			1			1	
3- Coaxial line and micro strip line (low – frequency and high – frequency solutions)					1	1		1	1	1	1				
4- Attenuation due to conductor and dielectric loss							1	1		1		1	1		1
5- Field analysis of transmission lines (traveling and standing waves)														1	1
6- Smith chart and impedance matching (single stub and double stub tuners and others).				1											1
Total Hours	1	1	1	1	1	3	3	3	1	2	3	1	1	2	4

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	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	
c7	1	1			1	1				1		1	1	1	
c8	1			1	1	1			1	1	1	1			
c9	1		1	1		1	1		1	1	1		1		
c10						1						1			
c11						1						1			
c12						1						1			
c13						1						1			
c14			1				1	1						1	1
c15			1				1	1						1	1
Σ	7	3	5	7	7	9	6	5	5	8	6	6	5	5	2

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	10
	Tutorials	3 Assignments per semester	10
Practical Exam (Lab + CAD)		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes

- 1- Microwave Engineering "Theoretical part"
- 2- Microwave Engineering "Practical part"

7-2 Required books

D. M.Pozar, **Microwave Engineering**, 4th ed., 2012, USA, John Wiley & sons, Inc.

7-3 Recommended books

R. E Collin, **Foundations for Microwave Engineering**, Second edition, 2001, N.Y, Mc Graw Hill.

7-4 Recommended Web sites

www.microwaveresearch.com

www.wavelineinc.com

www.maximintegrated.com

8- Facilities required for teaching and learning:

- Microwave Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Hazem El-Banna

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August 2020

Course Specification

ELCn331: Very Large Scale Integrated Systems(VLSI Systems)

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:	August, 2020

B - Basic Information

Title: Very Large Scale Integrated Systems	Code: E LCn331	Year / level: 3 rd , Spring
Credit Hours: 3	Pre-requisite: ELCn313	
Contact Hours: 5	Lectures: 2	Tutorial/Exercise: 1
	Lectures: 2	Tutorial/Exercise: 1

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge and understanding) related to the construction and operation of MOS transistors. They should compete on the design, calculate and estimate the performance of CMOS digital circuits. Also, they should compete on the definition and uses the different CMOS processing technologies.

2 – Competencies

- c1. Discuss, design steps, design matrices and the production cycle. (C3, C6)
- c2. Explain and sketch the MOS transistors switching function. (11)
- c3. Explain the different system modules representation for digital system or subsystem, using equations and tables and apply these modules to represent certain digital system or subsystem, e.g. half-adder, full-adder, multiplexer and coder. systems (C16).
- c4. Consider the design metrics principals, sketch the optimum design of a digital electronic system (sub-system) in transistor level, e. g. full adder, multiplexer, ...etc. (C12, 13)
- c5. Use DC transfer characteristic of the inverter to explain noise margin concept. (C14)
- c6. Understand the potential and limitations of a certain CMOS processing technology.to use it in a suitable application. (C14)
- c7. Read the standard symbols and colors used in basic CMOS technologies and apply them in the design of the electronic circuits (C15).
- c8. Explain and Compare the geometric design rules that are the interface medium between designer and fabricator used for the modern electronics and communication systems and sub-systems (17).
- c9. Introduce some technologies to the CMOS designer that is responsible for design the semiconductor devices. (C4.
- c10. Explain the theoretical background needed to calculate and sketch the DC transfer characteristics of the CMOS inverter and use it to discuss the effect of BETA Ratios in the CMOS Inverter characteristics. (C14, C16).
- c11. Practice self-learning and communicate effectively orally and in written form (C5, C8, C10).

This course contributes in the following competencies: **C3, C4, C5, C6, C8, C10, C11, C12, C13, C14 & C15.**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	. Introduction to VLSI. (Definitions and Terminologies)	2	1	2
2	. Introduction to CMOS circuits	2	-	2
3	. MOS transistors switches	2	1	2
4	. CMOS Logic, Circuit and system representations	2	1	2
5	. MOS transistor theory	2	1	2
6	. nMOS and pMOS enhancement transistor	2	1	2
7	Assessment (Mid- Term)	-	-	-
8	. MOS device design equations	3	2	2
9	. Complementary CMOS inverter-DC characteristics	3	2	3
10	. CMOS processing technology	1	1	2
11	. Silicon Semiconductor technology	2	1	2
12	. Basic CMOS technology , Layout design rules	2	1	2
13	. Basic physical design of simple logic gates	2	1	2
14	. Nanotechnology: history, Impact and applications	3	1	2
15	. Mini project; design and analysis of the CMOS circuit	2	1	3
Total hours		30	15	30

4. Course content / Course Competencies mapping matrix

Topic	Course Competencies										
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11
. Introduction to VLSI. Definitions and Terminologies	1		1								
. Introduction to CMOS circuits	1		1	1							1
. MOS transistors switches	1	1									1
. CMOS Logic (. Circuit and system representations)	1	1	1		1						1
. MOS transistor theory						1	1	1			
. nMOS and pMOS enhancement transistor						1	1	1	1		
. MOS device design equations	1	1		1	1						
. Complementary CMOS inverter-DC characteristics		1	1	1		1					
. CMOS processing technology	1					1					
. Silicon Semiconductor technology, . Layout design rules, Basic physical design of simple logic gates							1	1			
. Nanotechnology: history, Impact and applications					1	1	1		1		
. Mini project; design and analysis of the CMOS circuit					1					1	1
Topics Covering Competencies	6	4	4	3	4	5	4	3	2	1	4

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches, Reports & Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report	
c1	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			1	1	1	1		1	
c7	1	1		1		1	1		1	1	1			1	
c8	1	1	1	1	1	1	1		1	1	1	1		1	
c9	1	1				1			1	1	1	1		1	
c10	1	1		1	1			1	1		1		1		
c11	1	1	1				1	1					1		
Σ	11	11	2	8	3	6	3	2	1	9	10	6	4	2	4

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two Reports / Research per semester	6
	Tutorials	4 Assignments per semester	8
Practical	Final Lab Exam	Fifteenth week	10
	Reports	3 Reports per semester	6
	Mini project	Once per semester	4
Written Exam		Sixteenth week	40
Total			100

7- List of References

7-1 Course Notes:

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

7-2 Required Books:

- Neil H. E. Weste and Kamran Eshraghian (1993) Principles of CMOS VLSI Design: A system Perspective 2nd Ed, Addison Wesley.
- Neil H.E. Weste and David Harris (2005) CMOS-VLSI-Design: A Circuit and systems perspective 3rd Ed., Pearson Education Inc.

7-3 Recommended Books

- Jan M. Rabaey (2003) Digital Integrated Circuits: A Design Perspective 2nd Ed, Prentice Hall.
- Randall L. Geiger, Phillip E. Allen and Noel R. Strader (1990) VLSI Design techniques for Analog Digital circuit", McGraw-Hill, Inc.

7-4 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=Y8FvzcocT4> (VLSI Design)

8- Facilities Required for Teaching and learning

- VLSI LAB
- Lectures room equipped with OHP and data show facility
- High speed internet and communication facilities for distance learning.

Course Coordinator: Dr. Samir Kamal
Head of the Department: Prof. Dr. Shouman S. E. I.
Date: August, 2020

Course Specification

ELCn332: 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:	August, 2020

B - Basic Information

Title: VHDL	Code: ELCn332	Level: 3 rd Spring		
Credit Hours: 3	Pre-requisite: CMPn111			
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 designing and simulation basic logic circuits, design and evaluate combinational circuit building blocks, 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, implementation on FPGA.

2 – Competencies

- c1. Explain the main strategy of the embedded systems hardware based on VHDL. (C1,C2,C15).
- c2. Explain the VHDL foundations, considerations and requirements. (C2,C15).
- c3. Design the different digital communication systems based on VHDL. (C12,C13,C14,C17).
- c4. Explain the basic requirements to meet the software programs with hardware applications. (C14,C15).
- c5. Evaluate the final designed digital systems. (C14,C16).
- c6. Make strategy for designing the hardware of embedded systems. (C14,C15).
- c7. Solve engineering design based on VHDL in mini-project. (C5,C6,C12,C13,C17).
- c8. Learn how to use the Xilinx's editor and simulator to develop code. (C12,C16,C17).
- c9. Select the type of Field Programmable Gate Array (FPGA) to meet the desired application. (C3,C15,C16,C18)
- c10. Make the validation and verification for designed application. (C14)
- c11. Present the features, characteristics for the designed application. (C12).
- c12. Use the Xilinx's editor and simulator to create and develop VHDL code. (C12,C13,C14,C15,C17).
- c13. Use the Mentor graphic simulator to display the input and output digital signal of the designed systems. (C13,C14).
- c14. Use the Xilinx downloader and FPGA kits to check practically the VHDL code. (C18).
- c15. Design, realize and check digital systems based on VHDL. (C12,C13,C14,C15,C17).
- c16. Collaborate effectively within a team. (C7,C8,C9).
- c17. Communicate effectively through present data and results orally and in written form. (C5,C8).
- c18. Communicate effectively for managing the tasks, time, and resources. (C10).
- c19. Search for information in references and internet to engage in life-long self-learning discipline. (C5,C10).
- c20. Practice self-learning and communicate effectively orally and in written form (C10).

This course contributes in the following program competencies: **C1, C2, C3, C5, C6, C7, C8, C9, C10, C12, C13, C14, C15, C16, C17& C18**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	System design process.	2	1	-
2	Introduction to VHDL.	2	1	-
3,4	Using Xilinx editor and simulator to design different logic components.	4	2	4
5,6	Using Xilinx editor and simulator to design Combinational and sequential circuits.	6	4	4
7	Assessment (Mid- Term)	-	-	-
8,9	Using Xilinx editor and simulator to design different digital systems.	4	2	6
10,11	Using Mentor graphic simulator to display the input and output digital signals.	2	2	2
12	Using Xilinx simulator to check the verification of digital systems.	2	2	4
13	Using Xilinx downloader and FPGA Kits to check the validation of digital systems.	4	1	4
14	Making a mini-project.	2	-	3
15	Revision	2	-	3
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies																			
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18	c19	c20
System design process.	1	1	1		1	1	1			1	1				1	1	1		1	
Introduction to VHDL.	1	1	1			1	1	1		1		1	1	1	1					
Using Xilinx editor and simulator to design different logic components.	1	1	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1
Using Xilinx editor and simulator to design Combinational and sequential circuits.	1	1	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1
Using Xilinx editor and simulator to design different digital systems.	1	1	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1
Using Mentor graphic simulator to display the input and output digital signals.	1	1	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1
Using Xilinx simulator to check the verification of digital systems.			1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1
Using Xilinx downloader and FPGA Kits to check the validation of digital systems.	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Making a mini-project.			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Topics Covering Competences	7	6	9	7	8	9	9	8	2	9	8	8	8	8	9	3	7	6	7	6

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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
c5					1	1			1			1			1
c6		1	1	1		1				1	1		1		1
c7	1									1			1		
c8							1						1	1	
c9	1				1				1					1	
c10						1	1		1	1			1		1
c11	1	1	1	1						1	1			1	
c12					1	1						1	1		
c13	1						1					1	1		1
c14					1				1						
c15	1					1	1		1	1		1	1		
c16	1		1		1	1		1						1	
c17				1		1	1	1			1	1			
c18		1	1	1	1		1	1			1	1			1
c19								1							
C20		1	1		1			1		1		1	1	1	
Σ	8	6	8	7	8	8	8	5	6	8	7	8	8	8	7

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 6 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

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

7-2 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, MITIPress.

7-7 Recommended books: None

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

7-8 Periodicals, Web sites, etc.

- <http://www.Xilinx.com> (Last accessed March, 2021)
- <http://www.mentor.com> (Last accessed March, 2021)

8- 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: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn335: Modern Telephone Central Offices

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:	August, 2020

B - Basic Information

Title: Modern Telephone Central Offices	Code: ELCn335	Level: 3 rd Fall	
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:1	Practical: 2
	Pre-requisite: ELCn215		

C - Professional information

1 – Course Learning Objectives:

This course is an introduction to modern telephone networks and interfaces. Telephone sets, the central office and the Public Switched Telephone Networks are discussed in detail. Private (PBX) and public switches both digital and analog are discussed, with emphasis on features, signaling and technology. This course also concludes the transmission of audio signals through different networks. Laboratory experiments supplement the course and expose students to the fundamentals of analog and digital telephony.

2 – Competencies

- c1- Characterize electrical networks with respect to gain and loss in terms of dBs and dBms. (C1, C3, C8)
- c2- Describe the basic design of resistor attenuator networks using insertion loss techniques. (C2, C3, C8)
- c3- Analyze transmission lines in terms of characteristic impedance, propagation constant, phase velocity and line loading. (C5, C8)
- c4- Discuss how central offices process analog and digital telephone calls via the SLIC circuit. (C4, C5, C15)
- c5- Investigate the attenuation and Insertion Loss of Telephone Transmission Lines with and without Loading Utilizing Computer Simulations (C3, C16, C17)
- c6- Investigate the Telephone DC Local Loop with TLS (C3, C8, C16)
- c7- Evaluate the AC and Tone Local Loop Signaling Characteristics (C5, C17)
- c8- Study the local signal and digital switch principles assignments (C16, C17)
- c9- Evaluate the digital switch operation and Line scan assignments (C8, C17)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C8, C15, C16 & C17.**

3. Contents

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	Introduction	2	1	2
2	Basic analog circuit concepts related to Telephonic Communications Circuits:	2	1	2
3	Transmission Lines in the telephone voice frequency band:	2	1	2
4	Transmission Lines continued	2	1	2
5	Traditional PSTN:	2	1	2
6	The Local Loop, Telephone Set & Signaling	2	1	2
7	Assessment (Mid_Term)	2	1	2
8	Traffic	2	1	2
9	Switching	2	1	2
10	ADSL	2	1	2
11	FTTP	2	1	2
12	Internet Telephony	2	1	2
13	Cellular Telephony	2	1	2
14	Modern Trends	2	1	2
15		2	1	2
Total Hours		30	15	30

4. Course content/Course Competencies mapping matrix:

Topics	Competencies								
	c1	c2	c3	c4	c5	c6	c7	c8	c9
Introduction	1	1						1	
Basic analog circuit concepts related to Telephonic Communications Circuits:	1	1						1	
Transmission Lines in the telephone voice frequency band:			1						1
Transmission Lines continued	1	1	1	1	1			1	1
Traditional PSTN:			1						1
The Local Loop, Telephone Set & Signaling				1	1				
Traffic				1	1				
Switching	1		1		1		1		
ADSL									
FTTP		1	1	1			1	1	1
Internet Telephony	1	1			1				1
Cellular Telephony						1			1
Modern Trends			1				1		
Topics Covering Competencies	5	5	6	4	5	1	3	4	6

5 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1		1		
c4	1			1	1	1			1	1	1	1	1		
c5	1			1	1	1			1	1	1	1	1		
c6	1			1	1	1			1	1	1	1	1	1	
c7	1	1	1				1		1	1	1				
c8	1	1		1	1		1	1	1				1	1	1
c9	1			1	1				1	1	1		1	1	
∑	9	2	2	8	7	6	8	4	9	8	8	6	8	3	1

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Mid-Term Exam	7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)
	Tutorials	3 Assignments per semester
Practical Exam	14 th Week	20
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes: None

7-2 Required books

- Robert Boylestad, *Introductory Circuit Analysis*, 13th edition, Pearson Prentice Hall Publishers, 2016

7-3 Recommended books

- Warren Hioki, *Telecommunications*, Prentice Hall Publishers, ISBN 0-13-020031-X

7-5 Recommended Web Site

- <https://www.sciencedirect.com/topics/computer-science/telephone-system>

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Nelly Muhammad Hussein

Head of the Department: Prof. Dr. Shouman S. El.

Date: August, 2020

Modern Academy

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Course Specification

ELCn333: Radar Systems & 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:	August, 2020

B - Basic Information

Title: Radar Systems & Remot Sensing	Code: ELCn333	Level: 3 rd Spring
Credit Hours:3	Lectures: 2	Tutorial:2
	Pre-requiset: ELCn211	

C - Professional Information

1 – Course Learning Objectives

By the end of this course the students should have gained the planned competences (knowledge; skills and understanding) relating to the costruction ; operation and applications of rader systems and the function of their elements . They should compete on the analysis and calculation of performance for different types of radar systems and their components.

2 - Competencies

- c1- Classify and compare different radar systems (C2;) .
- c2- Explain the effect of atmosphere on radio waves propagation-sky wave radar (C1 ;C2; C5).
- c3- Explain Doppler phenomina ; operation and characteristics of basic C.W. radar to measure relative velocity of moving targets (C1 ; C17) .
- c4- Deduce mathematical relation describing the surveillance pulse radar maximum range equation as a function of subsystem and environmental parameters (C1 ;C13) .
- c5- Explain the construction ; operation and specification of components of pulse radar system ; transmitter and receiver (C11; C17) .
- c6- Explain the meaning of secondary radar system (transponder)... construction & maximum range (C1 ; C13) .
- c7- Investigate the effect of external and internal parameters of radar system on the radar maximum range (thermal noise; integration of echo pulses ; target fluctuation) (C1 ; C2; C17).
- c8- Analyze mathematically the effect of the probability of detection and probability of false alarm on the maximum range of radar (C1; C2) .
- c9- Evaluate the losses budget of the radar system, and its contribution on range of radar (C5;C9).
- c10- Design of radar subsystems parameters (Tx ; antenna ; Rx ;) to get required perfmance (C12;C13 ;C17).
- c11- Investigate how to improve the signal to noise ratio in pulse radars (C1 ; C2) .
- c12- Classify and compare different radar tracking systems (mono-pulse & split gate) (C16 ; C12).
- c13- Investigate the basic techniques for remot sensing radar SAR (C16 ; C17) .
- c14- Practice self-learning and communicate effectively (C8 ; C10) .

This course contributes in the following program competencies: **C1, C2, C5, C8, C9, C10, C11, C12 ,C13,C16&,C17.**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	What is RADAR ? Introduction ... radar as an active sensor ; & Classification of radar systems .	3	3	
2	CW radar system ,Doppler effect , measuring of relative velocity .	3	3	
3	Application of radar systems (military & civilian)	2	2	
4	Construction of surveillance pulse radar (Tx & Rx)	2	2	
5	Radar range equation.	2	2	
6	Receiver noise & Noise Figure and signal / noise (S/N) .	2	2	
7	Assessment (Mid- Term)	-	-	-
8	S/N as function of Probability of dection P_d & Probability of false alarm P_{fa}	2	2	
9	Integration of radar echo pulses .	2	2	
10	Target radar cross section fluctuation & De-correlation of echo signals.	2	2	
11	Range equation of secondary radar type system (transponder)	2	2	
12	Types of tracking radar systems .	2	2	
13	Mono-pulse tracking radar (amplitude & phase comparison) systems.	2	2	
14	Tracking by division of target echo pulse envelop.	2	2	
15	Remot sensing radar SAR .	2	2	
Total hours		30	30	

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14
What is RADAR ? Introduction radar as an active sensor & Classification of radar systems.	1	1	1											1
CW radar , Doppler effect, measuring of relative velocity.			1											1
Application of radar systems (military ; civilian)	1	1	1											1
Construction of pulse radar system (Tx and Rx).					1		1							
Radar range equation .		1		1			1	1	1					
Receiver noise ; Noise Figure; and S/N ratio.				1	1		1				1			
S/N as function of P_d and P_{fa} .							1	1						

Integration of n radar echo pulses.				1	1						1	1			
Target echo signal fluctuation and De-correlation of echo signals.										1					
Range equation of secondary radar (transponder) .					1	1				1	1				
Types of tracking radars.													1		1
Mono-pulse tracking radar (amplitude & phase comparison) systems.													1		1
Tracking by division of echo pulse envelop.													1		1
Remot sensing radar SAR.											1			1	1
Topics Covering Competencies	2	3	3	3	1	1	4	2	3	4	2	3	1	7	

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizes	Research & Presentations	Mini Project Report
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	1		1		
c5	1			1	1			1		1	1		1		
c6	1			1	1		1	1		1	1				
c7	1		1	1	1					1	1				
c8	1			1	1		1			1	1		1		
c9			1					1		1					
c10	1						1			1					
c11	1			1	1					1	1		1		
c12	1							1		1					
c13	1			1				1		1					
c14			1												
∑	12		5	9	8		7	7		13	9		6	1	

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	40
Mid-Term Exam	7-th Week	20
Practical Exam	-	-
Written Exam	Sixteenth week	40
Total		100

7- List of References

7-1 Course Notes

Tantawy, M. (2014) Radar Systems & Remote Sensing. Cairo: MAM Press.

7-2 Essential Books

Skolnik, M. (1962). Introduction to Radar Systems. NY: McGraw-Hill.

7-3 Recommended Books

Sen & Bhattacharya (2003). Radar Systems and Radio Aids to Navigation. Delhi: Khanna Publishers.

Kingsley & Quegan (2001). Understanding Radar Systems. Delhi: Meenakshi Printers.

7-4 Periodicals, Web Sites, etc.

[www.radartutorial.eu / index.en.html](http://www.radartutorial.eu/index.en.html)

8- Facilities Required for Teaching and Learning:

- Lectures
- OHP and Data show facility for presentation of lectures material.

Course Coordinator: Ass. Prof .Dr. Magdy O.Tantawy

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

Date: August, 2020

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Course Specification

ELCn334: Advanced Topic of Communication

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: August 2020

B - Basic Information

Title:Advanced Topic of communication **Code:**ELCn334 **Level:**3rdSpring
Credit Hours: 3 **Lectures:**2 **Tutorial/Exercise:**2 **Practical:** -
Pre-requisite: ELCn321

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to the characteristics of wireless channel and structure of selected wireless communication system.

- To introduce the mobile radio propagation large scale path loss model, large scale fading, and small scale fading.
- 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 - Competencies

- c1. Introduce the wireless communication system. (C4,C5)
- c2. Explain the path loss model and phenomena appear in mobile radio propagation large scale fading. (C1,C16)
- c3. Analyze the mathematical model of indoor and outdoor propagation model of large scale fading. (C1,C2,C5,C16)
- c4. Calculate the indoor and outdoor path loss model and propagation phenomena. (C1,C16).
- C5. Explain the small scale fading, power delay profile, coherent bandwidth, Doppler spread, and coherence time. (C4, C17).
- c6. Deduce the mathematical model of small scale fading, power delay profile, coherent bandwidth, Doppler spread, and coherence time. (C1, C17)
- c7. Deduce the mathematical values of mean excess delay and coherent bandwidth from channel impulse response. (C1, C2)
- c8. Classify and compare the characteristics of frequency selective, flat fading, slow fading, and fast fading channels. (C1,C2, C16)
- C9. Decide the type of small scale fading channel according to the coherent bandwidth or coherent time value. (C2)
- C10. Explain different mitigation techniques like diversity, coding, and equalizer. (C4,C16)
- c11. Deduce the mathematical model of outage probability of single and diversity branches. (C1,C16)
- c12. Explain the physical layer structure of advanced wireless communication system WiMAX, WiFi. (C4, C6, C17).
- c13. Investigate the parameter of advanced wireless communication system to mitigate the fading channel effect. (C5,C17)
- c14. Explain multicarrier modulation techniques as a modulation technique used in different wireless communication system. (C5, C16)
- c15. Solve limited operational problems related to the fading channel and their characteristics. (C4).
- c16. Collaborate effectively within multidisciplinary team (C5,C7,C9).
- c17. Practice self-learning and communicate effectively orally and in written form. (C8,C10).

This course contributes in the following program competencies: **C1, C2, C4, C5, C6, C7, C8, C9, C10, C16 & C17**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Introduction of wireless communication system& wireless channel.	2	2	-
	Defined large scale fading.			
2	Path loss model and phenomena appear in mobile radio propagation large scale fading.	2	2	-
3	Explaiin the characteristics of small scale fading and power delay profile.	2	2	-
4	Calculate the mean excess delay, coherent bandwidth.	2	2	
	Classification, explained the characteristics of flat fading and frequency selective fading channel.			
5	Deduce the mathematical model of frequency Doppler.	2	2	
	Calculate the coherent time.			
6	Classification, explained the characteristics of slow fading and fast fading channel.	2	2	
7	Assesment (Mid-term)	-	-	-
8	Explain the diversty, states types of diversity techniques.	2	2	-
	Calculate the outage probability of combined diversity technique.			
9	Deduced the outage probability of maximal ratio combining and equal gain ratio combining.	2	2	-
10	Explain the multicarrier modulation technique used in advanced wireless communication system.	2	2	-
11	Explain the orthogonality concept and the block diagram.	2	2	-
12	Deduced the mathematical model of IFFT block.	2	2	-
13	Explain the recent WiMAX standard as an advanced wireless communication system.	2	2	-
14	Explain the physical layer block diagram of WiMax system.	4	4	-
15	Explain WiFi standard as an advanced wireless communication system.	2	2	-
Total hours		30	30	-

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies																
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17
Introduction wireless communication system& wireless channel.	1	1		1													
Defined large scale fading		1	1	1													
Path loss model and phenomena appear in mobile radio propagation large scale fading.		1	1	1											1		
Explaiin the characteristics of small scale fading and power	1				1	1	1	1	1								1

delay profile.																	
Calculate the mean excess delay, coherent bandwidth.	1				1	1	1	1	1						1		1
Classification, explained the characteristics of flat fading and frequency selective fading channel.	1				1	1	1	1	1						1		1
Deduce the mathematical model of frequency Doppler.	1				1	1	1	1	1						1		
Calculate the coherent time	1				1	1	1	1	1						1		
Classification, explained the characteristics of slow fading and fast fading channel.	1				1	1	1	1	1						1		
. Explain the diversity, states types of diversity techniques.										1	1					1	
Calculate the outage probability of combined diversity technique.						1		1		1	1				1		
Deduced the outage probability of maximal ratio combining and equal gain ratio combining.						1		1		1	1					1	1
Explain the multicarrier modulation technique used in advanced wireless communication system.	1											1	1	1	1	1	1
Explain the orthogonality concept and the block diagram.	1											1	1	1	1	1	
Deduced the mathematical model of IFFT block	1											1	1	1	1	1	1
Explain the recent WiMAX standard as an advanced wireless communication system.	1											1	1	1		1	1
Explain the physical layer block diagram of WiMax system	1											1	1	1	1	1	1
Explain WiFi standard as an advanced wireless communication system.	1											1	1	1		1	
Topics Covering Competences	13	3	2	3	6	8	6	8	6	3	3	6	6	6	11	8	8

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1	1						1		1	1				
c2	1			1				1		1	1				
c3	1	1													
c4	1	1		1						1	1				
c5	1			1				1		1	1		1		
c6	1	1		1						1	1		1		
c7	1	1		1						1	1		1		
c8	1	1					1			1	1		1	1	
c9	1	1	1	1	1		1	1		1	1		1	1	
c10	1	1	1	1	1					1	1		1		
c11	1	1			1			1		1	1		1	1	
c12	1	1	1	1	1			1		1	1				
c13	1	1	1	1						1	1			1	
c14	1	1	1	1				1		1	1			1	
c15	1			1	1			1	1	1	1			1	
c16			1				1								
c17	1		1				1		1						
Σ	16	12	7	11	5	-	4	10	2	11	11	-	7	6	

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	2 Quizzes (one each 4 weeks)	20
	Tutorials	2 Assignments per semester	10
	Report	Once per semester	10
Written Exam		Sixteenth week	40
Total			100

7- List of references:

1- 7-1 Course notes: lecture notes about Advanced Topic of communications “Theoretical part”

7-2 Required books

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

2- Bernard Skalr (2001) “Digital Communication, fundamental and application” Prentice Hall PTR.

7-4 Recommended books:

Marcos Katz, Frank H. P. Fitzek, (2009) “WiMAX Evolution: Emerging Technologies and Applications”, Wiley.

7-4 Periodicals, Web sites, etc.

<https://www.hindawi.com/journals/mpe/2019/2719849/>, (Last accessed February, 2021)

<http://www.wirelesscommunication.nl/reference/chaptr05/diversit/mrc.htm> (Last accessed February, 2021)

http://rfmw.em.keysight.com/wireless/helpfiles/89600b/webhelp/subsystems/wlan-ofdm/Content/ofdm_basicprinciplesoverview.htm (Last accessed February, 2021)

Youtube

Lecture 1:

https://www.youtube.com/watch?v=famHgxC_x6M&list=PLrQsv5YoPWYgbM2zXgHd9IHWJ_k03tDwy&index=25

Lecture 2:

https://www.youtube.com/watch?v=ESBLUeUq85Y&list=PLrQsv5YoPWYgbM2zXgHd9IHWJ_k03tDwy&index=26

Lecture 3: [https://www.youtube.com/watch?v=ym-](https://www.youtube.com/watch?v=ym-ICUdIV2Q&list=PLrQsv5YoPWYgbM2zXgHd9IHWJ_k03tDwy&index=27)

[ICUdIV2Q&list=PLrQsv5YoPWYgbM2zXgHd9IHWJ_k03tDwy&index=27](https://www.youtube.com/watch?v=ym-ICUdIV2Q&list=PLrQsv5YoPWYgbM2zXgHd9IHWJ_k03tDwy&index=27)

Lecture 4:

https://www.youtube.com/watch?v=UKeu3jdhjnQ&list=PLrQsv5YoPWYgbM2zXgHd9IHWJ_k03tDwy&index=28

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- Computer, Data show and Computer programs; Matlab, labview.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Sara Fouad

Head of the Department:

Prof. Dr. Shouman S.E.I.

Date:

August 2020

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Course Specification CMPn321: Computer Architecture

A- Affiliation

Relevant program:	Computer Engineering and Information Technology BSc Program Electronic Engineering and Communication Technology BSc Program
Department offering the program:	Computer Engineering and Information Technology Department Electronic Engineering and Communication Technology Department
Department offering the course:	Computer Engineering and Information Technology Department
Date of specifications approval:	August 2020

B - Basic Information

Title: Computer Architecture	Code CMPn321	Level: 2 nd 3 rd Fall, spring	Practical: -
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 2	
	Pre-requisite: CMPn111		

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences related to the construction and operation 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 - Competencies

- c1. Explain the Basic Structure of computers and Foundations of Computer Architecture (C13)
- c2. Analyze, mathematically, the effect of the ALU, Memory, Cache memory on the system performance (C1, C14)
 - c3 Fundamentals of Arithmetic and logic units, Different types of Addressing Modes, Different classifications of parallel and pipeline processors, Architecture and organization of Memory unit (C7)
- c4. Concepts of Operating system support and Basic of assembly Programming(C15)
- c5. recognize and identify the structure of computer architecture, Evaluate the performance of A.L.U and parallel processor (C13)
- c6. Use a wide range of analytical tools, techniques, and software packages pertaining for programming the computer(C13)
- c7. Utilize computational facilities and techniques, to design different architectures of parallel processors and pipeline system(C9)
- c8. Communicate effectively and present data and results orally and in written form. Use ICT facilities in presentations, and manage resources efficiently(C8)
- c9. Practice self-learning, Search for information's in references, journals and in internet (C10)

This course contributes in the following program competencies : **C1, C7, C8, C9, C10, C13, C14,& C15**

3 – Contents

weeks	Topic	Lecture hours	Tutorial hours	Practical hours
1	Basic Structure of computers	2	2	-
2	Instruction cycle and Interrupts	2	2	-
3	Bus system and improving computer Performance	2	2	-
4	performance evaluation and techniques can be used by hardware designers to improve performance	2	2	-
5	Types of computer organizations and addressing format	2	2	--
6	Programming using different addressing modes	2	2	-
7	Assessment (Midterm exam)	2	2	
8	Arithmetic and logic units design	2	2	--
9	Memory types	2	2	
10	Design of cache memory	2	2	-
11	Performance measuring of cache	2	2	-
12	Operating system support	2	2	-
13	Pipeline system	2	2	
14	parallel processors	2	2	
15	Seminars	2	2	
Total hours		30	30	-

4. Course content/Course Competencies mapping matrix

Topic	c1	c2	c3	c4	c5	c6	c7	c8	c9
Basic Structure of computers	1		1				1		1
Instruction cycle and Interrupts	1		1						
Bus system and improving computer Performance	1		1				1		1
performance evaluation and techniques used by hardware designers to improve performance			1	1		1			1
Types of computer organizations and addressing format	1	1	1		1				
Programming using different addressing modes	1			1			1		1
Assessment (Midterm exam)	1	1	1						1
Arithmetic and logic units design		1	1						
Memory types		1							1
Design of cache memory		1	1						1
Performance measuring of cache		1				1			
Operating system support		1	1	1	1				
Pipeline system	1			1		1			
parallel processors	1	1	1		1	1	1		1
Seminars								1	1
Topics Covering Competences	8	8	10	4	3	4	4	1	9

5 - Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researched, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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				
c5	1	1		1				1		1	1		1		
c6	1	1		1	1					1	1		1		
c7	1	1		1				1		1	1		1		
c8	1	1	1				1							1	1
c9	1	1	1	1			1	1			1			1	1
Σ	9	9	2	8	1	0	2	5	0	7	8	0	5	2	2

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	12
	Reports/Research	Two reports per semester	8
	Tutorials	3 Assignments per semester	4
	Mini project	Once per semester	16
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

7-2 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.

7-3 Recommended books:

None

7-4 Periodicals, Web sites, etc.

<https://www.eecs.berkeley.edu/Courses/Data/188.html>

<http://www.GenLib.org/> .

8- Facilities required for teaching and learning:

- Computer Lab.
- Computer, Data show and Computer package..

Course coordinator:

Dr. Seham Ebrahim

Head of the Department:

Dr. Abd Elmoneim FoudA

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

GENn451a: Environmental Effects of Electromagnetic Waves

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 Civil 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 Department Architecture Engineering and Building Technology Department Civil Engineering and Building Technology Department
Department offering the course:	Basic Science Department
Date of specifications approval:	August 2020

B - Basic Information

Title: Environmental Effects of Electromagnetic Waves	Code: GENn451a	Level: 3 rd	
Credit Hours: 2	Lectures: 2	Tutorial/Exercise: -	Practical: -
	Pre-requisite: None		

C - Professional information

1 – Course Learning Objectives:

The study of electromagnetic waves effects help students for understanding and addressing complex environmental issues of EMW from a problem-oriented, interdisciplinary perspective.

2 – Competencies

- c1- Understanding the main concepts and methods from physical sciences and their application in environmental problem solving. (C4, C8)
- c2- Explain the basic information about electromagnetic waves. (C9, C10)
- c3 - Understanding the concepts and terminology for electromagnetic waves applications and uses. (C4)
- c4 - Classify the EMW environmental problems and ways of addressing them, including interactions across local to global scales. (C10)
- c5 - Demonstrate the critical reflection about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world. (C2, C3)
- c6 - Analyze, different types of environmental effects of electromagnetic fields. (C2, C3)
- c7 - Develop deep understanding and analysis of EMW environmental effects design. (C2, C3)
- c8 - Relate general theory to specific contexts. (C9)
- c9 - Critically analyze EMW environmental effect issues in communication as well as provide innovative solutions. (C2, C4)
- c10 - Select and use appropriate Strategies, methods and techniques for identifying, diagnosing and dealing with environmental effects. (C3, C6, C7)
- c11 - Develop problem solving approaches and controlling the environmental effects. (C2, C6, C7, C9)
- c12 - Enhance the ability to critically reflect on own and others' practice to improve own/others 'actions. (C2, C3, C7)
- c13 - Search for information and engage in life-long self-learning discipline. (C5, C9)
- c14 - Practice self-learning and communicate effectively orally and in written form. (C7, C8)

This course contributes in the following program competencies: **C2, C3, C4, C5, C6, C7, C8, C9, C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	➤ Maxwell's equations	1	-	-
1	➤ Optical properties of electromagnetic waves	1	-	-
2	➤ Physical properties of electromagnetic waves	1	-	-
3	➤ Electromagnetic radiation	1	-	-
4	➤ Electromagnetic waves spectrum	2	-	-
5	➤ Antenna and transmission lines	2	-	-
6	Ground waves, sky waves, and space waves	2	-	-
7	➤ Mid term	2	-	-
8	➤ Radio waves and fading of electromagnetic waves	2	-	-
9	➤ Applications of electromagnetic waves	1	-	-
9	➤ Absorption of electromagnetic waves	1	-	-
10	➤ Health and environmental effects of electromagnetic waves	2	-	-
10	➤ Health and environmental effects of non-ionizing radiation	2	-	-
11	➤ Radio frequency radiation	2	-	-
12	➤ Microwave oven	1	-	-
12	➤ Radar and human health	1	-	-
13	➤ Infrared radiation health effect	2	-	-
14	➤ Visible light health effect	1	-	-
14	➤ Ultraviolet radiation health effect	1	-	-
15	➤ International recommendations for radiation exposure	2	-	-
Total		30	-	-

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	C8	C9	c10	c11	c12	c13	c14
Maxwell's equations	1	1	1				1	1		1	1		1	1
Optical properties of electromagnetic waves	1	1	1				1	1	1	1	1		1	1
Physical properties of electromagnetic waves	1	1	1				1	1	1	1	1		1	1
Electromagnetic radiation	1	1	1	1	1	1	1	1	1	1	1		1	1
Electromagnetic waves spectrum	1	1	1	1	1	1	1	1	1	1	1		1	1
Antenna and transmission lines	1	1	1	1	1	1	1	1	1	1	1		1	1
Ground waves, sky waves, and space waves	1	1	1	1	1	1	1	1	1	1	1		1	1
Radio waves	1	1	1	1	1	1	1	1	1	1	1		1	1
Fading of electromagnetic waves	1	1	1	1	1	1	1	1	1	1	1		1	1
Applications of electromagnetic waves	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Absorption of electromagnetic waves	1	1	1	1	1	1	1	1	1	1	1		1	1
Health and environmental effects of electromagnetic waves	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Health and environmental effects of non-ionizing radiation	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Radio frequency radiation	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Microwave oven	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Radar and human health	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Infrared radiation health effect	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Visible light health effect	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ultraviolet radiation health effect	1	1	1	1	1	1	1	1	1	1	1	1	1	1
International recommendations for radiation exposure	1	1	1	1	1	1	1	1	1	1		1	1	
Topics Covering Competences	20	20	20	17	17	17	20	20	19	20	20	9	20	20

5 – Course Competencies/Teaching, Learning and Assessment methods:

Course Competencies	Teaching Methods				Learning Methods	Assesment Method		
	Lecture	Discussions and seminars	Tutorials	Problem solving	Research and Reports	Written Exam	Quizes	Assignments
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	1
c5	1	1			1	1	1	1
c6	1	1			1	1	1	1
c7	1	1			1	1	1	1
c8	1	1			1	1	1	1
c9	1	1			1	1	1	1
c10	1	1			1			
c11	1	1			1			
c12	1	1			1			
c13		1			1			
c14	1	1			1	1	1	1
Σ	13	14			14	10	10	10

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	5 th and 10 th	20
	Assignments/ Reports	Bi- Weekly	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-6 Course notes:

Environmental Effects of Electromagnetic Waves.

7-4 Required books:

Physics for Scientists and Engineers, Raymond A. Serway, Thomson Brooks, 2004; 6th Edition. Introduction to RF Propagation, John S. Seybold, by John Wiley & Sons, Inc: 2005.

7-5 Recommended books:

Halliday, David, Robert Resnick, Jearl Walker.

7-4 Periodicals, Web sites, etc.

<http://www.slideshare.net/bleonacoba/history-of-electromagnetic-waves-discovery>

<http://www.infocellar.com/networks/wireless/spectrum.htm>

Serway, RAYMOND Physics for scientists and engineers 6th Ed. San Francisco: (2003).

Health Effects of Electromagnetic Fields– Department of Communications, Marine and Natural Resources. Expert Group on Health Effects of Electromagnetic Fields. 29–31 Adelaide Road, Dublin 2, Ireland. www.dcmnr.gov.ie

8- Facilities required for teaching and learning:

- Library.
- Computer, Internet, and Data Show.

Course coordinator:

Dr. Marwa Shoeib

Head of the Department:

Associat Professor / Ashraf Taha EL-Sayed

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification GENn452a: Civilization and Heritage

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 offering the course: Architecture Engineering and Building Technology Department

Date of Update : August 2020

B - Basic Information

Title: Civilization and Heritage

Code: GENn452a **Level :** 4th, **Tenth Semester (Level Four)**

Credit Hours: 2

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

Pre-requisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this is course the student should have background in the field of social, cultural and humanitarian studies throughout identifying the cultural environment;and must be able to analyses the meaning, features, characteristics, and social interaction, in addition to its impact on the human's needs in the field of specialization. In addition,The student must be able to generate ecologically responsible,eniromental conservation and rehabilitation heritage. And 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 - Competencies

- c1. Classify and compre between Heritage buildings and Architecture (C1)
- c2. Explain, Analyze and Adapt innovative approaches in urban and architectural design considering the cultural backgrounds and realities of the local community. (C3, C5)
- c3. Explain the theoretical background needed and Generate and develop selective interventions that cope with the significance of Architectural Heritage (C1, C7,C9).
- c4. Investigate and Evaluate and criticize the outcomes of urban and Architectural projects in relation to cultural and heritage considerations (C8, C9)
- c5. Practice self-learning and communicate effectively orally and in written form (C8, C10).
- c6. Search for information required to develop successful approaches in design. (C9).
- c7. Evaluate environmental conservation and rehabilitation designs. (C10)

This course contributes in the following program competencies: **C1, C3, C5, C7, C8, C9, C10**

3 – Contents

Week	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 heritage	2		
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- Assignment	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 case studies of urban and Architectural projects corresponding to the cultural dimension of the societies.	2		
14	international case studies of urban and Architectural projects corresponding to the cultural dimension of the societies.	2		
15	Research project presentation and discussion	2		
Total hours		30		

4. Course content/Course Competencies mapping matrix:

Topic	c1	c2	c3	c4	c5	c6	c7
General definitions, terms, and characteristics of culture and Architecture)	1		1				
Definitions, Classification of Heritage, World Heritage sites.	1	1	1	1	1	1	1
The Interrelation between culture and traditional and heritage		1	1		1	1	
The Interrelation between culture and Civilization (General theories, concepts and examples)	1	1		1	1		1
expression - Features and characteristics (A detailed discussion of the multi-components of culture in urban sites.	1	1	1	1	1	1	
Social interaction and urban environment – perception, environment image and behavior patterns.		1	1	1	1		
General definitions, terms, and characteristics of culture and Architecture)	1	1		1	1	1	
Definitions, Classification of Heritage, World Heritage sites.	1	1	1	1	1	1	1

The Interrelation between culture and traditional and heritage		1	1	1		1	
The role of participation and community involvement in Architectural and Urban Design (Local Case studies)	1	1		1	1	1	1
A brief discussion of the Anthropology as a tool of understanding local and indigenous cultures and its application to Architecture	1	1	1	1	1	1	
Regionalism of architecture and architectural expression	1	1		1	1		1
Urban Heritage (A review of Values)			1	1	1		1
Urban and Architectural Conservation (A review of interventions)	1	1	1		1		1
Topics Covering Competences							
	10	12	11	11	11	10	6

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1	1	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				
c5	1	1	1					1		1	1		1	1	
c6	1	1	1		1		1	1		1	1		1	1	1
c7	1	1					1			1				1	1
Σ	7	7	4		2		3	4		7	6		4	4	3

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Mid-Term Exam	7 th Week	20
Semester Work	Quizzes	2 Quizzes (one each 4 weeks)
	Reports/Research	Two reports per semester
Written Exam	Sixteenth week	40
Total		100

7- List of references:

7-1 Course notes: None

7-2 Required 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
- Silverman, H., & Waterton, E., & Watson, S., (2017), "Heritage in Action: Making the Past in the Present", Springer International Publishing, Switzerland.
- Born, G., (2006), "Architecture, Preserving Paradise: The Architectural Heritage and History of the Florida Keys", The History Press, USA.

7-3 Recommended books: None

- 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 المويلحي (2005) "العمارة بين الثقافة والتنمية نحو فهم ثقافة مجتمع المستخدمين لخدمة عملية التنمية من خلال البرمجة المعمارية" رسالة ماجستير غير منشورة، كلية الهندسة، جامعة القاهرة.
- Silverman, H., & Waterton, E., & Watson, S., (2017), "Heritage in Action: Making the Past in the Present", Springer International Publishing, Switzerland.
- Born, G., (2006), "Architecture, Preserving Paradise: The Architectural Heritage and History of the Florida Keys".

7-4 Periodicals, Web sites, etc.

- 1- <https://www.ierek.com/news/index.php/2017/06/03/architectural-cultural-heritage>
[http://www.cultureindevelopment.nl/Cultural Heritage/What is Cultural Heritage](http://www.cultureindevelopment.nl/Cultural%20Heritage/What%20is%20Cultural%20Heritage)
<https://en.unesco.org/themes/biodiversity/culture-values>
- 2- **Course Links:**

Lecture No.	URL (Youtube Links)
1	https://youtu.be/dAw_vMIuxrs
2	https://youtu.be/Q2anXY8suNc
3	https://youtu.be/BAz72vtzU2I
4	https://youtu.be/umirdwrXzeQ
5	https://youtu.be/PrOGtofq_Xc
6	https://youtu.be/CzwMD8Bo7sU
7	https://youtu.be/XyJfLLChZdc
8	https://youtu.be/LyaCGQEDERM
9	https://youtu.be/yT7WS6TGXQw

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- Computer, Data show
- High speed internet and communication facilities for distance learning.

Course coordinator: Professor Nahed Omran

Head of the Department: Dr. Asamer Mohamed

Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification GENn453: 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
Civil 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
Civil Engineering and Building Technology Department

Department offering the course:

Basic Science Department

Date of specifications approval:

August 2020

B - Basic Information

Title: Marketing

Code: GENn453

Level: 3th

Credit Hours: 2

Lectures: 2

Tutorial/Exercise:

Practical:

Pre-requisite: non

C - Professional information

1 – Course Learning Objectives:

مع نهاية تدريس هذا المقرر يكون الطالب قد اكتسب المهارات التي تمكنه من فهم مجال المبيعات، إدارة قوة المبيعات الاستراتيجية، عملية البيع الشخصية وتنظيم قوى المبيعات، تنمية 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، ومعرفة سياسة التوزيع و استراتيجية الترويج.

2 – Competencies:

- c1- يستطيع الطالب كيفية ادارة المبيعات وتطوير برنامج المبيعات- (C9, C1)
- c2- تحليل حجم المبيعات، تحليل تكلفة التسويق والربح، تقييم الأداء- (C8)
- c3- (C9) تنمية وتوظيف البائعين، اختيار وتوظيف المتقدمين
- c4- (C1, C2) يكتسب الطالب مهارات في مجال اساسيات ادارة المبيعات
- c5- يدرك الطالب كيفية اختيار وتوظيف المتقدمين وفضل الطرق لتحفيز فريق المبيعات- (C1, C2)
- c6- (C1, C2) يستطيع الطالب تحليل تكلفة التسويق حسب مناطق التوزيع و الربح
- c7- (C7) تدريب الطالب على كيفية البحث عن المعلومات في المراجع وفي الانترنت
- c8- (C1, C9) يكتسب الطالب كيفية العمل في فريق و اشراكهم في مناقشات جماعية
- c9- (C7, C8) تعليم الطالب على كيفية ايجاد الطرق اللازمة لابتكار كل ما هو جديد
- c10- (C7, C10). يكتسب الطالب الخبرة في ايجاد حلول عملية تخدم برامج خارج تخصصه

This course contributes in the following program competencies: **C1, C2, C7, C8, C9, C10**

3 – Contents

week	Topic	Lecture hours	Tutorial hours	Practical hours
1	مفهوم التسويق ومراحل تطور الفكر التسويقي	2	-	-
2	ادارة وتخطيط وتنظيم قوة المبيعات	2		
3	التنبؤ بالمبيعات واساليب التنبؤ	2		
4	اختيار القوى العاملة	2		
5	توظيف المتقدمين	2	-	-
6	الرقابة التسويقية	2	-	-
7	امتحان منتصف الفصل	2		
8	تكاليف التسويق	2	-	
9	تحليل التكاليف التسويقية	2		
10	تعظيم الأرباح	2	-	-
11	رقابة وخفض التكلفة	2		
12	استراتيجية الترويج	2		-
13	سياسة التوزيع	2	-	-
14	مفهوم واشكال قنوات التوزيع	2		
15	مراجعة عامة	2	-	-
Total hours		30	-	-

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies									
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10
مفهوم التسويق ومراحل تطور الفكر التسويقي	1						1	1	1	1
ادارة وتخطيط وتنظيم قوة المبيعات	1	1	1				1	1	1	1
التنبؤ بالمبيعات واساليب التنبؤ	1	1					1	1	1	1
اختيار القوى العاملة			1	1	1		1	1	1	1
توظيف المتقدمين			1	1	1		1	1	1	1
الرقابة التسويقية				1		1	1	1	1	1
تكاليف التسويق						1	1	1	1	1
تحليل التكاليف التسويقية						1	1	1	1	1
تعظيم الأرباح						1	1	1	1	1
رقابة وخفض التكلفة						1	1	1	1	1
استراتيجية الترويج							1	1	1	1
سياسة التوزيع							1	1	1	1
مفهوم واشكال قنوات التوزيع							1	1	1	1
Topics Covering Competences	3	2	3	3	2	5	13	13	13	13

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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		1			1	1	
c5	1	1					1	1					1	1	
c6	1	1	1				1			1			1		
c7	1	1	1					1					1	1	
c8	1	1					1								
c9	1	1					1	1		1					
c10	1									1					
Σ	10	9	4	-	-	-	7	5	-	7	-	-	6	6	

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	2 Quizzes (one each 4 weeks)	10
	Assignments	3 assignments per semester	15
	report	One report per semester	15
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: Marketing

7-2 Required books

MARKETING PRINCIPLES AND PERSPECTIVES

WILLIAM O. BEARDEN New York : McGraw-Hill/Irwin, ©2004

7-3 Recommended books: None

7-4 Periodicals, Web sites, etc.

- 1- <http://goo.gl/CH9x4G>
- 2- <http://goo.gl/8mNZU1>
- 3- <http://goo.gl/8txKD9>

8- Facilities required for teaching and learning:

- Computer, Data show.
- Computer programs.
- High speed internet and communication facilities for distance learning

Course coordinator:

Dr. Shaymaa Sherif

Head of the Department:

Prof. Dr. Ashraf Taha

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn360: Industrial Training-2

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology Department
Department offering the course: Electronic Engineering & Communication Technology Department.
Date of specifications approval: August 2020

B - Basic Information

Title: Industrial Training-2 **Code:** ELCn360 **Level:** 3rd Summer
Credit Hours: 0 **Lectures:** - **Tutorial/Exercise:** - **Practical:** -
Pre-requisite: ELCn260

C - Professional information

1 – Course Learning Objectives:

By the end industrial training course, students will gain skills of one of three fields:

1-1 Mobile Package Training:

This training presents the evolutionary path of mobile systems starting with 2G systems (GSM/GPRS/EDGE) through 3G (WCDMA, HSxPA), 4G (LTA, LTE-A) systems to 5G and IoT standards following 3GPP documentation and real-world implementations. Among different aspects of mobile systems, major pressure is put on network architecture including radio access and core network. Additionally, the course also covers the evolution of services and different call scenarios.

1-2 Optical Fiber Training:

This Course is the starting point for person making an entry into the fiber optic profession. The objective is to give knowledge and skills to telecom technician working with optical Fiber. Upon completing this course student will be able to effectively and efficiently install, terminate, and test multimode fiber optic networks to existing standards.

1-3 CCNA Training:

The Implementing and Administering Cisco Solutions course provides a broad range of fundamental knowledge for all IT careers. Through a combination of lecture and hands-on labs, you will learn how to install, operate, configure, and verify a basic IPv4 and IPv6 network. The course covers configuring network components such as switches, routers, and Wireless LAN Controllers; managing network devices; and identifying basic security threats. Network programmability, automation, and software-defined networking are also covered at a foundational level. This course helps you prepare to take the 200-301 Cisco Certified Network Associate (CCNA) exam.

2 – Competencies

2-1 Competencies of Mobile Package training:

- c1- Understand Mobile Communication Networks Evolution, network types. (C2, C6)
- c2- Understand Mobile Channel Channel characteristics, fading, receiver structures Cellular Network Design. (C2, C6)
- c3- Analyze Physical Layer Radio link budgets, frequency allocation, traffic planning. (C2, C6)
- c4- Implement GSM System Air interface, logical channels, frame structures, modulation and coding, interleaving
- c5- Realize Data Link Layer Call control, handover and roaming, location updates (C11, C13)
- c6- Understand Data Services SMS, CS data, GPRS, MMS (C6, C11)
- c7- Understand Developments Towards 3rd Generation Mobile Networks, UMTS System structure, UTRA / FDD : modulation and coding, channel concepts. (C2, C13)

2-2 Competencies of Optical Fiber training:

- c1- Understand Basics of fiber optics (C2, C6)
- c2- Analyze Fiber optics pulling (C2, C6)
- c3- Implement Fiber optics connectors splices and tools (C2, C6)
- c4- Implement Fiber optics equipments and testing (C11, C13)
- c5- Realize Fiber handling and cleaning (C11, C13)
- c6- Instal Fiber safety (C6, C11)

2-3 Competencies of CCNA training:

- c1- Build simple LANs, perform basic configurations for routers and switches, and implement IPv4 and IPv6 addressing schemes. (C2, C6)
- c2- Configure routers, switches, and end devices to provide access to local and remote network resources and to enable end-to-end connectivity between remote devices. (C2, C6)
- c3- Develop critical thinking and problem-solving skills using real equipment and Cisco Packet Tracer. (C2, C6)
- c4- Configure and troubleshoot connectivity a small network using security best practices. (C11, C13)
- c5- Configure initial settings on a network device using Cisco command-line interface (CLI). (C11, C13)
- c6- Implement basic network connectivity between devices. (C6, C11)

This course contributes in the following program competencies: **C2, C3, C6, C11, C13 & C17.**

3-1 Contents of Mobile Package Systems

Session No.	Topics	Hours
1	Fundamentals of Cellular System.	5
2	GSM Network Architecture.	5
3	GSM Air Interface.	5
4	Digital Mobile Elements.	5
5	GSM Network Protocols.	5
6	Introduction to GPRS&EDGE.	5
7	Fundamentals of CDMA.	6
8	UMTS Evolution &Air interface.	6
9	The UMTS Network.	6
10	UMTS Transmission Chain.	6
11	UMTS Protocols.	6
Total Number of Hours		60

3-2 Contents of Optical Fiber Course

Session No.	Topics	Hours
1	Fiber Optic Fundamentals	5
2	Fiber Optic Cables Preparing & Splicing	5
3	Fiber Optic Cables Measurements	5
4	SDH	5
5	PDH Multiplexing	5
6	Principles and Characteristics of the SDH	5
7	Basic Elements of STM-1	6
8	Mapping	6
9	Pointer	6
10	Overhead	6
11	Monitoring, Maintenance and Control in the SDH	6
Total Number of Hours		60

3-3 Contents of CCNA Course

Session No.	Topics	Hours
1	Explore the Network	5
2	Configure a Network Operating System	5
3	Network Protocols and Communication	5
4	Network Access	5
5	Ethernet	5
6	Network Layer	5
7	IP Addressing	6
8	Subnetting IP Networks	6
9	Transport Layer	6
10	Application Layer	6
11	Build a Small Network	6
Total Number of Hours		60

4 - Teaching and Learning and Assessment methods:

Course Competences	Learning Methods			Assesment Methods				
	Lecture	Presentations & Movies	Discussions & seminars	Laboratory & Experiments	Modeling and Simulation	Written Exam	Practical Exam	Mini Project Report
c1	1					1		
c2	1					1		
c3	1		1			1		
c4	1			1	1	1	1	
c5	1			1	1	1	1	
c6	1			1	1	1	1	
Σ	6	-	1	3	3	6	3	0

6- Assessment Timing and Grading:

Assessment Method	Grade (Degrees)
Students Participation	20
Mini- project	20
Final Evaluation Project	20
Final Oral Discussion	40
Total	100

7- List of references:

7-1 **Course notes:** None

7-2 **Required books:** None

7-3 **Recommended books:** None

7-6 **Recommended Web Site**

- <https://mega-academy.org/index.html>
- <https://www.netacad.com/>

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.
- PC Lab with licensed Software

Course coordinator:

Dr. Hazem El- Banna

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August 2020

Modern Academy for Engineering
and Technology in Maadi



Course Specification
ELCn425: Digital Signal Processing

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
Computer Engineering and Information Technology Department

Department offering the course: Electronic Engineering and Communication Technology Department

Date of specifications approval: August, 2020

B - Basic Information

Title: Optical Fiber Communications **Code:** ELCn425 **Level:** 4th Fall

Credit Hours: 3 **Pre-requisite:** MTHn103, CMPn211

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

2 - Competencies

- c1. Explain and sketch the continuous-time signal and List its main features, to apply it in a specific application. (C10)
- c2. Explain and sketch the discrete-time signal and List its main features, to apply it in a specific application. (C10)
- c3. Discuss and Compare the continuous-time and discrete-time signals. (C11)
- c4. Explain, Classify and Compare between different digital filters. (C12, C16)
- c5. Use a suitable advanced software, e. g. MATLAB, to design digital filters for some certain specifications and estimate their performance. (C2, C14, C16)
- c6. Discuss the digital filters design steps to choose a suitable national and international standards and codes to design and implement the digital filters for a specific application. (C15)
- c7. Practice self-learning and communicate effectively orally and in written form (C5, C8, C10).
- c8. Disuse, Analyze and compare the correlation and convolution operations to take their concepts in the design of digital systems or sub-systems. (C12, C17)
- c9. Forming groups to work as a team on a specific project, making use of what they learned in DSP course. (C7)

This course contributes in the following program competencies: **C2, C5, C7, C8, C10, C11, C12, C14, C15, C16 & C17.**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	• Signal, system and signal processing	2	2	1
2	• Classification of signals	1	-	-
3	• The concept of frequency in continuous-time and discrete-time signals.	2	2	1
4	• Analog-to-digital and digital-to-analog conversion	1	2	-
5	• Discrete Fourier Transform (DFT) and its inverse	2	2	1
6	• Computational complexity of the DFT	2	2	2
7	Assessment (Mid- Term)	-	-	-
8	• Correlation, cross-correlation, and convolution	4	3	2
9	• Z- transform and its inverse , Properties	6	3	1
10	• Application of Z-transform in DSP	2	4	2

11	<ul style="list-style-type: none"> Design of the digital filters 	-	3	1
12	<ul style="list-style-type: none"> Types of the digital filters and choosing between them 	1	-	-
13	<ul style="list-style-type: none"> FIR filter design 	2	2	1
14	<ul style="list-style-type: none"> IIF filter design 	3	3	1
15	<ul style="list-style-type: none"> Mini project; design, analysis and measure the performance of digital filter applications. 	2	2	2
Total		30	30	15

4. Course content / Course Competencies mapping matrix

Topic	Course Competencies								
	c1	c2	c3	c4	c5	c6	c7	c8	c9
<ul style="list-style-type: none"> Signal, system and signal processing 	1	1	1						
<ul style="list-style-type: none"> Classification of signals 	1	1	1						
<ul style="list-style-type: none"> The concept of frequency in continuous-time and discrete-time signals. 	1	1	1						
<ul style="list-style-type: none"> Analog-to-digital and digital-to-analog conversion 			1						
<ul style="list-style-type: none"> Discrete Fourier Transform (DFT) and its inverse 									
<ul style="list-style-type: none"> Computational complexity of the DFT 									
<ul style="list-style-type: none"> Correlation, cross-correlation, and convolution 								1	
<ul style="list-style-type: none"> Z- transform and its inverse 									
<ul style="list-style-type: none"> Properties of the Z-transform 						1			
<ul style="list-style-type: none"> Application of Z-transform in DSP 				1		1			1
<ul style="list-style-type: none"> Design of the digital filters 				1	1	1	1	1	1
<ul style="list-style-type: none"> Types of the digital filters and choosing between them 				1	1	1			1
<ul style="list-style-type: none"> FIR filter design 					1	1	1	1	1
<ul style="list-style-type: none"> IIF filter design 					1		1	1	1
<ul style="list-style-type: none"> Mini project; design, analysis and measure the performance of digital filter applications. 					1	1	1	1	1
Topics Covering Competencies	3	3	4	3	5	6	4	5	6

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report	
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	1	1	1		
c4	1	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				
c7	1	1		1		1	1	1	1	1			1		
c8	1	1	1	1	1		1		1	1	1	1		1	
c9	1	1	1	1		1	1		1		1		1	1	
Σ	9	9	4	9	5	7	3	3	4	6	5	8	5	4	4

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two Reports / Research per semester	6
	Tutorials	4 Assignments per semester	8
Practical	Final Lab Exam	Fifteenth week	10
	Reports	3 Reports per semester	6
	Mini project	Once per semester	4
Written Exam		Sixteenth week	40
Total			100

7- List of References

7-1 Course Notes:

- Digital Signal Processing “Theoretical and “Practical parts”

7-2 Essential Books (Text Books)

- Emmanuel C. Ifeakor and Barriew W. Jervis (2002) Digital signal processing: A practical Approach 2nd Ed, Prentice-Hall.
- John G. Proakis and Dimitris G. Manolkis (2007) Digital Signal Processing: Principles, Algorithms and Applications, Fourth Edition, Pearson Prentice Hall.

7-3 Recommended Books

- Nasser Kehtarnavaz, (2008) Digital Signal Processing System Design Second Edition, Elsevier Inc
- Sanjit K. Mitra (2006) Digital Signal Processing: A computer Based Approach 3rd Ed., McGraw-Hill. International Edition.

7-4 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>

8- Facilities Required for Teaching and learning

- DSP LAB.
- Lectures room equipped with OHP and data show facility
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Samir Kamal
Head of the Department: Prof. Dr. Shouman S. E. I.
Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn422: Communications 3

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: August, 2020

B - Basic Information

Title: Communications3
Credit Hours: 4

Code: ELCn422 **Level:** 4th Fall
Lectures: 3 **Tutorial/Exercise:** 1 **Practical:** 2
Pre-requisites: (MTHn107) and (ELCn321)

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 source and channel coding processes and discrete channel analysis. They should be able to introduce the main principles of information theory and to explain the different coding techniques with examples. By the end of the course, the students should be able to calculate, analyze and design the digital communication system performance, considering different source and channel coding techniques and to analyze the discrete channel memory-less model and probability of error calculation.

2 – Competencies

- c1. Identifying the main coding stages applied in digital systems and explaining the main goal of each stage. (C1)
- c2. Perform some calculations on Information sources: Zero Memory Source (ZMS) and Markov Source (MS) such as Information amount and source entropy. (C1).
- c3. Understand the concept of source coding and the efficient characteristics that should exist in source codes. (C1).
- c4. Analyze and design suitable source codes for a group of symbols with optimum characteristics and take decision about the suitable source coding technique for a specific application. (C1, C3, C5, C12, C17).
- c5. The objective of channel coding technique and difference among its various types. (C1)
- c6. Analyze and design different channel coding circuits and studying the relative advantages and disadvantages, taking into account the effect of the used coding parameters. (C1, C3, C4, C5, C12, C14, C17)
- c7. Take decision about the suitable channel coding technique applied in the digital communication system (C17)
- c8. The ability to analyze, design and compare between different digital communication systems, considering different source and channel coding techniques as a mini practice project. (C1, C3, C4, C6, C12, C14, C17)
- c9. Analyze a discrete communication channel model and calculate the probability of error for a given model. (C1, C5, C14)
- c10. Use a computer software, MATLAB, and other available programs to simulate zero memory information sources and their n^{th} extensions and calculate their relative parameters like Information amount and source Entropy. (C2)

- c11. Design a software program that creates source codes using Huffman method and make some operation on the output codes such as: average code length and coding efficiency to show the advantages/disadvantages for different ZMS cases. (C2, C9).
- c12. Use computer software, MATLAB, and other available programs to simulate a simple digital communication system in the presence of noisy channel, transmitting random bits and find the BER at the receiver (C2)
- c13. Use computer software, MATLAB, and other available programs to simulate a complete digital communication system, considering a linear channel block coding stage: Hamming – cyclic, in the presence of noisy channel and find the BER at the receiver for different parameters to show the tradeoffs. (C2, C3).
- c14. Use computer software, MATLAB, and other available programs to simulate a complete digital communication system, considering a convolutional coding stage in the presence of noisy channel and find the BER at the receiver for different circuit configurations to show the tradeoffs. (C2, C3)
- c15. Design a program to compare between different channel coding techniques: Hamming – cyclic – convolutional based on BER performance versus SNR variation and comparing with the same communication system that ignores the channel coding stage to show the tradeoffs (C2, C3).
- c16. Use computer software, MATLAB, and other available programs to simulate a simple digital communication system in the presence of noisy channel, transmitting text and measure the effect at the receiver with/without channel coding techniques (C2,C14).
- c17. Design a software program to analyze the discrete memory-less channel and measures its performance (C2).
- c18. Communicate effectively orally and in written form (C8,C10).

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C6, C8, C10, C12, C14 & C17**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	26. Introduction to Information theory, source coding and channel coding in digital communication systems.	3	1	2
	27. Types and measurements of Information sources. ➤ Zero Memory Source (ZMS)			
2	➤ Calculations for the ZMS ➤ n^{th} extension ZMS	3	1	2
3	➤ Markov Source (MS)	3	1	2
4	28. Properties of valid source codes with introduction to source coding methods.	3	1	2
5	29. Tree and Huffman source coding methods and calculations of source coding efficiencies	3	1	2
6	30. Shannon-Fano source coding method	3	1	2
	31. General example on source coding methods to evaluate their performance relative to each other			
7	Assessment (Mid- Term)	-	-	-
8	32. Channel coding methods, Tradeoffs and applications	3	1	2
	➤ Automatic Repeat Request (ARQ) ➤ Linear block codes			
9	➤ Hamming channel coding method and the relative implementation	3	1	2

	circuit			
10	➤ Cyclic channel coding method and the relative implementation circuit	3	1	2
11	➤ Convolutional encoding and the Viterbi's algorithm	3	1	2
12	33. Mini project: calculate, evaluate, and design a general digital communication system for different cases.	3	1	2
13	34. Discrete information channels	4	1	2
	➤ Discrete memoryless channels			
14	➤ Channel capacity and Entropy	4	1	3
15	➤ Evaluating the performance, considering the effect of noise due to transmission	4	2	3
Total hours		45	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies																	
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18
Introduction to Information theory, source coding and channel coding in digital communication systems.	1									1								1
Types and measurements of Information sources and explaining the Zero Memory Source (ZMS)		1								1								
Calculations for the ZMS		1								1								
The n^{th} extension ZMS and their relative calculations		1								1								1
Markov Source (MS)		1																1
Properties of valid source codes with introduction to source coding methods.			1															1
Tree and Huffman source coding methods and calculations of source coding efficiencies			1	1							1							
Shannon-Fano source coding method.			1															
Explaining a general example on source coding methods to evaluate their performance relative to each other			1	1														1
Channel coding methods: ARQ – Forward Error Correction (FEC) codes, showing the relative tradeoffs and applications					1													1
Hamming channel coding method and the relative implementation circuit					1	1	1						1					
Cyclic channel coding method and the relative implementation circuit					1	1	1						1					
Convolutional encoding and the Viterbi's algorithm					1	1	1							1				

Mini project: calculate, evaluate, and design a general digital communication system for different cases.	1	1	1		1		1	1							1	1		1
Discrete information channels, demonstrating the discrete memoryless channels									1								1	
Channel capacity and Entropy									1								1	1
Evaluating the performance, considering the effect of noise due to transmission									1		1							
Topics Covering Competencies	2	5	5	2	5	3	4	1	3	4	1	1	2	1	1	1	2	8

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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	1		1	1	
c5	1	1	1	1			1	1		1	1		1	1	1
c6	1	1	1	1	1		1	1		1	1		1	1	
c7	1	1	1	1	1					1	1			1	
c8	1	1	1	1	1			1		1	1				1
c9	1			1				1		1	1				
c10		1				1			1			1	1		
c11		1				1		1	1			1	1		
c12		1				1			1			1			
c13		1				1			1			1			
c14		1				1			1			1			
c15		1				1			1			1			
c16		1	1			1			1			1			1
c17		1				1			1			1			
c18			1											1	1
∑	9	16	7	8	3	8	3	6	8	9	8	8	8	5	6

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes per semester	15
	Discussions and seminars	Once per semester	5
	Remarkably achievements	Weekly	Bonus (5)
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: Communications (III) “Theoretical part” and Communications (III) “Practical part”

7-2 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

7-3 Recommended books: None

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

7-4 Periodicals, Web sites, etc.

(2778) Modern Academy for Engineering & Technology - YouTube, (Last accessed March, 2021)

<https://eng.synceg.net/>, (Last accessed March, 2021)

Information Theory Shannon book (shef.ac.uk), (Last accessed March, 2021)

A Basic Convolutional Coding Example - Wikibooks, open books for an open world, (Last accessed March, 2021)

Information Theory, Coding and Cryptography - Ranjan Bose - Google Books, (Last accessed March, 2021)

8- Facilities required for teaching and learning:

- Computer Lab. Installed with MATLAB program
- Lecture and Exercise rooms equipped with Computer, Data show and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Shaimaa ElSayed Ibrahim

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

Date: August, 2020

Modern Academy
for Engineering and Technology in Maadi



Course Specification
ELCn460: Project-2 a

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: August 2020

B - Basic Information

Title: Project-2 a **Code:** ELCn460 **Level:** 4th Fall
Credit Hours: 2 **Lectures:** 2 **Tutorial/Exercise:** - **Practical:** 2
Pre-requisite: ELCn361

C - Professional information

1 – Course Learning Objectives:

This course is the first of a two-course sequence in which the students will develop a complete software system. The second stage will be carried out in project-2 b. Students will work in groups of up to four students, each group will have a supervisor to guide them through the system development process using a specific methodology. In this first part, each group must identify a problem domain, define the problem, identify and specify the requirements, document the current system, analyze it, propose alternative systems, and design a solution. The design must include the definitions of all the required system models, such as the data model and the functional model. At the end of the course, each group must submit a formal report documenting the complete process.

2 – Competencies

- c1- Construct a working schedule for the project. (C3, C6)
- c2- Present Clear aim and objectives of the graduation project. (C2, C11)
- c3- Present the literature review with relation to the selected topic. (C2, C11)
- c4- Carry out the design (or any topic selected). (C13, C17)
- c5- Write a technical report. (C6, C11)
- c6- Defend the technical report in front of a committee and be able to answer questions asked by the committee members. (C13, C17)

This course contributes in the following program competencies: **C3, C2, C6, C11, C13 & C17.**

3. Contents

Week No.	Topics	Lecture hours	Practical hours
1	Schedule for the project	2	1
2	Objectives of the graduation project.	2	1
3		2	1
4		2	1
5	How to make literature review with relation to the selected topic	2	1
6		2	1
7		2	1
8	Discuss block diagram and design of the project	2	1
9		2	1
10		2	1
11	How to write a technical report	2	1
12		2	1
13		2	1
14		2	1
15	How to defend the technical report in front of a committee and be able to answer questions asked by the committee members	2	1
Total		30	15

4. Course content/Course Competencies mapping matrix:

Topics	Competencies					
	c1	c2	c3	c4	c5	c6
1. Schedule for the project	1					
2. Objectives of the graduation project.		1				
3. How to make literature review with relation to the selected topic			1			
4. Discuss block diagram and design of the project.				1		
5. How to write a technical report					1	
6. How to defend the technical report in front of a committee and be able to answer questions asked by the committee members						1
Σ	1	1	1	1	1	1

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1		1				1				1				
c2	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	1		1			1	1
c6	1	1	1			1			1		1			1	
Σ	9	2	2	8	7	6	8	4	9	8	8	6	8	3	1

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work	Participation every Week	30
	3 Reports	30
Final Discussion Comette	Internal Examiners	10
	External Exminers	20
Total		100

7- List of references:

7-1 Course notes: None

7-2 Required books

- Dependent on project title

7-7 Recommended books

- Dependent on project title

7-8 Recommended Web Site

- Dependent on project title

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Nelly Muhammad Hussein

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn424: 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: August 2020

B - Basic Information

Title: Radio and Television Engineering Systems
Code : ELCn424
Level: 4th Fall
Credit Hours: 4
Lectures: 3
Tutorial: 1
Practical: 2
Pre-requisite: ELCn211

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competencies (knowledge and skills) related to radio and TV circuits and their basic elements. They should compete on the design, calculate, operate, and analyze the performance of radio and TV circuits.

2 – Competencies

- c1- Study different types of analog modulators and demodulators. (C1, C2, C5, C6, C11)
- c2- Study different types of radio receiver fundamentals. (C2, C5)
- c3- Study the TV. Principles, TV Camera, and color signal construction. (C2, C5)
- c4- Study the FM stereo system and compare it with the mono FM system. (C2, C9, C17, C18)
- c5- Design different types of modulators and demodulators. (C1, C2, C3, C6, C11, C12, C13)
- c6- Design radio receivers. (C3, C10, C12, C13)
- c7- Carryout signal processing of video and audio signals in both transmitters and receivers. (C3, C10, C12, C13)
- c8- Describe the structure of the TV transmitter and the TV receiver. Examine how to solve reception and synchronization problems using simple designs (C3, C10, C12, C13)
- c9- Design and build-up of radio circuits. (C3, C10, C12, C13)
- c10- Design and estimate the fundamental parameters of radio receivers. (C3, C7, C10, C12, C13, C14)
- c11- Communicate effectively through assignments. (C13)
- c12- Search for information and engage in life-long self-learning discipline. (C9, C10)

This course contributes in the following program competencies: **C1 C2 C3 C5 C6 C9 C10 C11 C12 C13 C14 C17 & C18**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	1. Study the importance of modulation techniques.	3	2	1
2	2. Study and analysis the modulation techniques.	3	2	1
3	3. Study and analysis the demodulation techniques.	3	2	1
4	4. Radio transmitter	3	2	1
5	5. Radio receiver ➤ The radio system started and developed.	3	2	1
6	➤ The evaluation parameter of a radio receiver.	3	2	1
7	Assessment (Mid- Term)	-	-	-
8	➤ Study the fundamentals of a radio system.	3	2	1
	➤ TRF radio receiver			
9	➤ Superheterodyne radio receiver	3	2	1
10	➤ Advanced Superheterodyne radio receiver	3	2	1
11	➤ Basic radio transmitter and receiver circuits	3	2	1
12	➤ FM stereo system	3	2	1
13	6. TV system ➤ TV camera and construction of monochromatic signal.	4	2	1
14	➤ The monochromatic TV transmitter and receiver. ➤ Scanning and synchronization.	4	3	1
15	➤ Prime colors and color mixing fundamentals. ➤ The Color TV transmitter and receiver.	4	3	2
Total hours		45	30	15

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Study the importance of modulation techniques.	1											
Study and analysis the modulation techniques.	1				1						1	
Study and analysis the demodulation techniques.	1				1						1	
Radio transmitter		1									1	1
Radio receiver		1									1	1
➤ The radio system started and developed.		1										1
➤ The evaluation parameter of a radio receiver.		1										1
➤ Study the fundamentals of a radio system.		1			1					1	1	1
➤ TRF radio receiver	1	1			1	1			1	1	1	1
➤ Superheterodyne radio receiver		1		1	1	1				1	1	1
➤ Basic radio transmitter and receiver circuits	1		1	1			1	1		1	1	
➤ FM stereo system	1		1	1			1	1		1	1	
TV system			1				1	1				1
➤ TV camera and construction of monochromatic signal.			1				1	1				1
➤ The monochromatic TV transmitter and receiver.			1				1					

➤ Scanning and synchronization.														
➤ Prime colors and color mixing fundamentals.			1						1	1				
➤ The Color TV transmitter and receiver.														1
Topics Covering Competencies	6	6	5	3	4	2	5	5	1	5	9	8		

5 - Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method				
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations
c1	1	1									1		1	
c2	1	1	1			1	1	1	1	1	1	1		1
c3	1	1	1	1		1	1	1	1	1	1	1	1	
c4	1	1		1		1	1		1	1	1	1		
c5	1	1		1		1	1	1	1	1	1	1	1	
c6	1	1	1	1	1	1	1			1	1	1	1	
c7	1	1	1	1	1	1	1			1	1	1	1	
c8	1	1	1	1	1	1	1			1	1	1	1	1
c9	1	1	1	1	1	1	1	1	1	1	1	1	1	1
c10	1	1	1	1	1	1	1			1	1	1	1	
c11	1	1	1	1			1	1		1	1	1	1	
c12	1	1	1							1				
Σ	12	12	9	9	5	9	10	5	5	11	11	10	9	8

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Radio and Television Engineering Systems “Theoretical part”
- Radio and Television Engineering Systems “Practical part”

7-2 Required books

Simon S. Haykin (2001), Communication Systems, Fourth Edition, John Wiley & Sons, ISBN: 0471178691
LEON W. COUCH (2001), DIGITAL AND ANALOG COMMUNICATION SYSTEMS, Prentice-Hall, U.S.A, ISBN: 0-13-081223-4

7-3 Recommended books: None

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

7-4 Periodicals, Web sites, etc.

<https://www.electronics-notes.com/articles/radio/superheterodyne-receiver/block-diagram.php>

(Last accessed January 2021)

8- Facilities required for teaching and learning:

- Radio and TV Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- Computer, Data show, and Computer programs; lab view, Matlab.

Course coordinator: Dr. Eman Mohammed
Head of the Department: Prof. Dr. Shouman S.E.I.
Date: August, 2020

Modern Academy for Engineering
and Technology in Maadi



Course Specification ELCn431: Optical Fiber Communications

A- Affiliation

Relevant program/s: Electronic Engineering and Communication Technology BSc Program
Department offering the program: Electronic Engineering and Communication Technology BSc Program
Department offering the course: Electronic Engineering and Communication Technology Department
Date of specifications approval: August, 2020

B - Basic Information

Title: Optical Fiber Communications **Code:** ELCn431 **Level:** 4th Fall
Credit Hours: 3 **Pre-requisite:** ELCn324
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 – Competencies

- c1. Design and implementation of limited range optical fiber system. (C3,C12,C13,C15,C17).
- c2. Select the proper light source and kind of modulation. (C1,C16).
- c3. Select the light detector and construction of optical receiver. (C1,C15,C16,C18).
- c4. Explain the Noise analysis, power budget & bandwidth budget of the system. (C11,C12).
- c5. Investigate of optical transmitters for analog and digital communication. (C12,C13,C14,C15).
- c6. Investigate of optical receivers for analog and digital communication. (C12,C13,C14,C15).
- c7. Investigate of distortion in optical fibers. (C9,C14).
- c8. Identify bandwidth and power requirements. (C11,C12)
- c9. Judge the optical communication system requirement. (C3,C5,C16,C17,C18)
- c10. Identify the studied system given the specification requirements. (C14,C15)
- c11. Construct of an optical communication system. (C16,C17,C18).
- c12. Measure and evaluate the optical system performance. (C12,C13,C14)
- c13. Use experimental facilities to investigate System performance. (C5,C14).
- c14. Work in stressful environment and within constraints. (C7,C8,C9).
- c15. Communicate effectively for managing the tasks, time, and resources. (C10).
- c16. Search for information and engage in life-long self-learning discipline. (C5,C8,C10).

This course contributes in the following program competencies: **C1, C3, C5, C7, C8, C9, C10, C11, C12, C13 & C14, C15, C16, C17 & C18.**

3- Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Constituents of optical fiber communication system: Electromagnetic wave spectrum and blackbody radiation.	2	-	2
2	Power transfer evaluation throughout the system. Radiometry of power quantities.	2	-	2
3	Concept of fiber optics as information channel	2	2	1
4	Dispersion in fiber optics and rate of data limitations.	2		1
5	Types of optical cables	2		1
6	Methods of fabrication.	2		1
7	Assessment (Mid- Term)	-	-	-
8	Optical components and integrated wave guide:	4	2	2
9	Propagation and cavity resonators.	2	1	2
10	Optical couplers.	2	1	2
11	Light sources:	1	1	2
12	Point and extended sources. Blackbody sources.	2	1	2
13	LED and LD. Spectrum of LD and LASER sources	1	2	2
14	Light detectors and Noise generator in the detectors.	4	3	6
15	System design and selection of individual components: Power budget and frequency budget.	2	2	4
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies															
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16
Constituents of optical fiber communication system.	1		1	1	1	1			1	1	1	1	1		1	1
Electromagnetic wave spectrum and blackbody radiation.	1		1	1	1	1			1	1	1	1	1		1	1
Power transfer evaluation throughout the system.				1				1							1	1
Radiometry of power quantities.				1				1								
Concept of fiber optics as information channel.	1		1		1	1	1		1		1	1				
Dispersion in fiber optics and rate of data limitations.	1		1		1	1	1		1		1	1				
Types of optical cables.	1		1		1	1	1		1		1	1		1		
Methods of fabrication.	1												1	1	1	1
Optical components and integrated wave guide.	1		1	1	1	1			1	1	1	1	1		1	1
Propagation and cavity resonators.	1			1	1	1	1		1		1	1	1	1	1	1
Optical couplers.	1		1	1	1	1			1	1	1	1	1		1	1
Light sources.		1	1												1	
Point and extended sources.	1														1	
Blackbody sources.	1														1	

LED and LD.	1	1	1					1								
Spectrum of LD and LASER sources.	1	1	1		1		1	1		1	1	1	1	1	1	1
Light detectors and Noise generator in the detectors.	1	1	1				1			1		1		1	1	1
System design and selection of individual components	1			1	1	1	1		1		1	1	1	1	1	1
Power budget and frequency budget.	1		1	1	1	1			1	1	1	1	1		1	1
Topics Covering Competencies	16	4	12	9	11	10	6	5	10	6	12	11	10	5	14	11

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods				Assessment Method				
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1					1	1		1	1			1	1	
c2	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	1	
c6	1			1	1		1			1	1		1	1	
c7	1			1	1					1	1		1	1	
c8	1			1	1		1			1	1		1	1	
c9	1			1	1		1			1	1		1	1	
c10	1			1	1		1		1	1	1		1	1	
c11						1	1					1	1		
c12			1			1	1		1			1	1	1	
c13			1			1	1		1			1	1	1	
c14		1	1			1	1	1	1			1	1	1	
c15		1	1			1	1	1	1				1	1	
c16	1	1	1			1	1	1	1	1			1	1	
∑	11	5	7	6	8	7	15	4	7	11	6	4	7	15	14

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 6 weeks)	6
	Reports/Research	Two reports per semester	4
	Tutorials	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes:

- Optical Fiber Communications “Theoretical Part”
- Optical Fiber Communications “Practical Part”

7-2 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

7-3 Recommended books: None

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

7-4 Periodicals, Web sites, etc.

- www.ieeexplore.ieee.org (Last accessed March, 2021)

8- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.
- Complete Lab for optical fiber communications.
-

Course coordinator: Dr. Abdel Moneam Elmahdy

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

Date: August, 2020

Modern Academy
for Engineering and Technology in Maadi



Course Specification

ELCn432: Microwave Circuits 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: August, 2020

B - Basic information

Title: Microwave Circuit and Devices **Code:** ELCn432 **Level:** 4th, Fall
Credit Hours: 3 **Pre-requisite:** ELCn324
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 devices. This can be done through envisaging and analyzing the relevant topics; cavity resonators, microwave circuits, passive microwave devices, microwave tubes, and microwave semiconductor elements.

2 – Competencies

- c1. Identify the basic concepts of microwave resonator. (C1, C10).
- c2. Deduce the circuit models for different cavity resonators. (C13, C14).
- c3. Review the voltage and current waves analysis in microwave circuits.. (C1, C10).
- c4. Understand the Impedance and scattering matrix of different microwave circuits. (C1, C10).
- c5. Identify the different circuits given impedance and scattering parameters (C1, C10).
- c6. Use the Z, Y and S parameters to calculate power and VSWR for different microwave circuits. (C12, C13).
- c7. Use the suitable microwave components to measure Z, S parameters for any two port network. (C13, C14).
- c8. Introduce the block diagram of microwave parametric amplifier and analyze its gain and bandwidth (C1, C5).
- c9. Deduce the mathematical relations for different passive and active microwave devices. (C12, C13).
- c10. Design of different passive microwave circuits (directional coupler – hybrid junction – isolator and circulator). (C16, C17, C18).
- c11. Calculate microwave power in directional coupler, hybrid junction, isolator, and circulator (C13, C14).
- c12. Develop the field analysis of the two-cavity klystron amplifier, reflex klystron and magnetron (C12, C13).
- C1. Identify the characteristics of different semiconductor microwave circuits (switch-mixer and negative resistance oscillator) (C1, C5).
- c14. Search for information from references, journals and internet. (C5, C10).
- c15. Write technical reports and presentations (C5, C10).

This course contributes in the following program competencies: **C1, C5, C10, C12, C13, C14, C15, C16, C17& C18**

3- Contents:

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	Microwave resonators.	2	1	2
2	Design of different types of cavities.	2	1	2
3	Cavity resonators parameters, length, frequency, quality factors. ..etc	2	1	2
4	Impedance, admittance and scattering matrices for two-port	3	2	3
5	Impedance, admittance and scattering matrices for 3-port and 4-port networks.	3	2	3
6	Passive microwave devices (Coupler – Hybrid Junction)	2	1	3
7	Assessment (Mid- Term)	-	-	-
6	Passive microwave devices (Attenuator – Power dividers, ... etc).	2	1	3
8	Ferrite microwave devices (Isolators).	2	1	2
9	Ferrite microwave devices (Circulators).	2	1	2
10	Microwave amplifier and oscillator (Klystron – Magnetron).	2	1	2
11	Microwave systems and applications	2	1	2
12	Microwave semiconductor devices (PIN diode – Varactor).	2	1	2
13	Microwave semiconductor devices (Negative resistance Diodes).	2	-	2
14	Revision	1	1	-
15	Revision	1	-	-
Total hours		30	15	30

4. Course content/Course Competencies mapping matrix:

Topic	Course Competencies														
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15
Microwave resonators.	1	1	1												1
Design of different types of cavities.	1	1	1											1	
Cavity resonators parameters, length, frequency, quality factors. ..etc	1	1	1												1
Impedance, admittance and scattering matrices for two-port networks				1	1	1	1	1	1					1	
Impedance, admittance and scattering matrices for 3-port and 4-port networks.				1	1	1	1	1	1						1

Passive microwave devices (Coupler – Hybrid Junction)										1	1	1			1	
Passive microwave devices (Attenuator – Power dividers, ... etc).										1	1	1				1
Ferrite microwave devices (Isolators).												1	1		1	
Ferrite microwave devices (Circulators).												1	1			1
Microwave amplifier and oscillator (Klystron – Magnetron).													1	1	1	
Microwave systems and applications													1	1		1
Microwave semiconductor devices (PIN diode – Varactor).														1	1	
Microwave semiconductor devices (Negative resistance Diodes).														1		1
Topics Covering Competencies	3	3	3	2	2	2	2	2	2	4	2	4	4	4	7	7

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods				Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project	Report
c1	1	1						1		1						
c2	1			1				1		1	1		1			
c3		1		1				1			1		1			
c4	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			
c8	1	1					1		1	1						
c9	1			1			1		1	1	1		1			
c10		1		1		1	1		1		1	1	1			
c11	1			1	1	1				1	1	1	1			
c12		1		1	1	1					1	1	1			
c13	1	1				1				1		1				
c14								1							1	
c15								1							1	
Σ	9	8	3	9	2	6	5	7	4	9	9	6	9	2		

6- 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 12 th	6
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes

- 1- Microwave Circuit and Devices “Theoretical part”
- 2- Microwave Circuit and Devices “Practical part”

7-2 Required books

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

7-3 Recommended books

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

7-4 Web sites:

www.microwaveresearch.com

www.wavelineinc.com

www.maximintegrated.com

8- 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: Dr. Ibrahim Amin Ibrahim
Head of the Department: Prof. Dr. Shouman S. El.
Date: August, 2020

3. Contents

Week No.	Topics	Lecture hours	Tutorial hours
1	Introduction	2	2
2		2	2
3	Vibration and Waves	2	2
4		2	2
5	Acoustic Wave Equation	2	2
6		2	2
7	Midterm Evaluation	2	2
8	Acoustic Wave Equation and its Basic Physical Measures	2	2
9		2	2
10	Waves on a Flat Surface of Discontinuity	2	2
11		2	2
12	RADIATION	2	2
13		2	2
14	K-H Equation & Baffled Piston Problem	2	2
15	DIFFRACTION AND SCATTERING	2	2
Total Hours		30	30

4. Course content/Course Competencies mapping matrix:

Topics	Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Introduction	1	1						1				
Vibration and Waves	1	1						1				
Acoustic Wave Equation			1						1			1
Acoustic Wave Equation and its Basic Physical Measures	1	1	1	1	1			1	1	1		
Waves on a Flat Surface of Discontinuity			1						1			
RADIATION			1	1	1				1		1	
K-H Equation & Baffled Piston Problem				1	1					1	1	1
Diffraction and Scattering			1	1	1				1	1	1	1
Total	3	3	5	4	4			3	5	3	3	3

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1		1		
c4	1			1	1	1			1	1	1	1	1		
c5	1			1	1	1			1	1	1	1	1		
c6	1			1	1	1			1	1	1	1	1	1	
c7	1	1	1				1		1	1	1				
c8	1	1		1	1		1	1	1		1		1	1	1
c9	1			1	1				1	1	1		1	1	
∑	9	2	2	8	7	6	8	4	9	8	8	6	8	3	1

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	20
	Tutorials	3 Assignments per semester	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: None

7-2 Required books

- Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens , James V. Sanders, "Fundamentals of Acoustics" 4th Edition, Dec 2021

7-5 Recommended books

- by J. Paul Guyer, "An Introduction to the Fundamentals of Acoustics and Vibrations" , August 2015

7-6 Recommended Web Site

https://www.ioa.org.uk/diploma-acoustics-and-noise-control/?gclid=EAlaIQobChMI9dvG7b-x8qIV0u3tCh2SVwxQEAAAYASAAEqITGvD_BwE

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Nelly Muhammad Hussein

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn421: Antennas and Wave Propagation.

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: August 2020

B - Basic Information

Title: Antennas and Wave Propagation **Code:** ELCn421 **Level:** 4th Spring
Credit Hours: 4 **Lectures:** 3 **Tutorial/Exercise:** 1 **Practical:** 2
Pre-requisite: ELCn323

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, design of different types of antennas, in addition of measuring different parameters of antenna. It also deals with the different wave propagation types.

2 – Competencies

- c1. Understanding of concepts and theories of antennas (C1, C9).
- c2. Apply the knowledge and define the physical concepts of antenna parameters (C1, C3, C5).
- c3. Demonstrate the solution methods of achieving the field equations to get the antenna parameters (C3, C9).
- c4. Reading about different wave propagation modeling and ways (C10, C11).
- c5. Evaluation of pattern and design parameters for most types of antennas (C10, C11).
- c6. Use vector potential function to solve Maxwell's equation (C1, C3).
- c7. Solve the integral equation for different types of antennas (C1, C9).
- c8. Evaluate the characteristics and performance of Different antenna types (C3, C12).
- c9. Using integral equation to solve Maxwell's equations for the antenna (C1, C9).
- c10. Antennas and array antenna design for required performance (C17, C18).
- c11. Measure radiation patterns of different antenna types and analyze is antenna parameters (C17, C18).
- c12. Solve problem sets and assignments and revision problems (C1, C3, C5).
- c13. Practical measurements in antenna lab (C17, C18).

This course contributes in the following program competencies: **C1, C3, C5, C8, C9, C10, C11, C12, C13, C14, C17 & C18**

3. Contents

Topics	Lecture hours	Tutorial hours	Practical hours
• Introduction to antenna types and radiation mechanism	2	-	-
• Basic antenna parameters	7	5	-
• Measurement Techniques of antenna parameters	-	-	4
• Mathematical tools for antenna analysis and design	5	1	-
• Wire antennas: • Dipole (infinitesimal, small, finite length, long)	5	3	5
• Loop antenna (circular and square)	2	1	4
• Special types of wire antennas (Helix and Yagi)	3	-	4
• Aperture antennas: • Rectangular and circular aperture	3	-	2
• Microstrip antennas	3	1	4
• Horn antennas	3	-	4
• Reflector antennas	3	-	
• Array antennas: • Two element array and	2	1	1
• N-element linear array of uniform amplitude and spacing	2	2	2
• N-element linear array of non-uniform amplitude and uniform spacing - Binomial array - Dolph-Tschebyscheff array	2	1	-
• Wave propagation ways and models	3	-	-
Total Hours	45	15	30

4. Course content/Course Competencies mapping matrix:

Topics	Competencies												
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13
Introduction to antennas	1												
Basic antenna parameters	1	1										1	
Measurement Techniques of antenna parameters	1	1											
Mathematical tools for antenna analysis and design		1	1			1		1				1	
Wire antennas: Dipole (infinitesimal, small, finite length, long)			1	1	1		1	1			1	1	1
Loop antenna (circular and square)			1	1	1		1	1			1	1	1

Topics	Competencies												
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13
Special types of wire antennas (Helix and Yagi)			1	1	1		1	1			1	1	1
Aperture antennas: Rectangular and circular aperture			1	1	1		1	1			1	1	1
Microstrip antennas				1	1			1			1	1	1
Horn antennas				1	1						1		1
Reflector antennas				1	1	1	1	1			1	1	1
Array antennas: Two element array and										1	1	1	1
N-element linear array of uniform amplitude and spacing										1	1	1	1
N-element linear array of non-uniform amplitude and uniform spacing - Binomial array - Dolph-Tschebyscheff array										1	1	1	1
Wave propagation ways and Models											1	1	1
Total	3	3	5	7	7	2	5	7	-	3	13	12	11

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods				Assessment Method				
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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	1		1	1	1		1	
c5	1			1	1	1			1	1	1	1	1		
c6	1		1	1	1		1	1	1	1	1			1	
c7	1	1	1	1	1	1			1	1	1	1			
c8		1				1	1			1	1	1	1		1
c9	1		1	1	1		1	1	1	1	1				
c10			1			1	1					1		1	1
c11						1					1				
c12				1	1			1	1	1	1		1		
c13				1	1			1	1	1	1		1		
Σ	8	5	6	8	8	7	7	6	7	11	9	7	5	4	2

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	10
	Tutorials	3 Assignments per semester	10
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes

- 1- Antenna and Wave Propagation "Theoretical part"
- 2- Antenna and Wave Propagation "Practical part"

7-2 Required books

Constantine, A. Balanis. "Antenna Theory Analysis and Design" 4th edition, 2016, New York, John Wiley.

7-3 Recommended books

- Krauss, J. & Marhefka, R.J. "Antennas For All Application", 2002, Boston, McGraw Hill.
- R. Collin, Antennas and Radiowave propagation, Mc Craw hill, 1985.
- Antennas and propagation for Wireless communication systems, 2nd ed., 2007, John Wiley.

7-4 Periodicals, Web sites, etc.

<http://www.antenna-theory.com/> NPTEL: Electronics & Communication Engineering - Advanced Antenna Theory
<http://nptel.ac.in/courses/117107035/>

8- Facilities required for teaching and learning:

- Antenna Lab.
- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Hazem El-Banna

Head of the Department:

Prof. Dr. Shouman S. El Shahat

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn423: Communications 4

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: August, 2020

B - Basic Information

Title: Communications4 **Code:** ELCn423 **Level:** 4th Spring
Credit Hours: 4 **Lectures:** 3 **Tutorial/Exercise:** 1 **Practical:** 2
Pre-requisites: ELCn321

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the student should have good understanding about different communication systems' applications like satellite communications, spread spectrums and multiple access techniques, and mobile communications. Also, the objective of this course is to enable the students to exploit the signal analysis (in both time and frequency domains) to evaluate the performance through signal propagation, and consequently find solutions to possible problems and choose the suitable communication system parameters for performance enhancement.

2 – Competencies

- c1. Analyze and determine the different signals' main parameters in both time and frequency domains (C1, C12)
- c2. Choose a suitable communication system/subsystem according to the propagating signal's main parameters (C1, C12).
- c3. Study some problems related to signal's transfer through different communication systems and methods that can be used to reduce their effect (C3, C12, C16).
- c4. Design advanced communication systems (C3, C12).
- c5. Measure and test signal's flow through communication system/subsystem for different parameters using advanced technologies (C2, C3, C6, C10, C12, C13, C14, C18)
- c6. Choose the suitable Modulation/Multiplexing techniques for different communication channels (C1, C5, C12, C14, C16)
- c7. Study of safety and security of communication process (C1, C4, C5, C10, C16)
- c8. Classify and compare Spread spectrum techniques and multiple access techniques (C1, C2, C5, C12)
- c9. Measure the performance levels of communication systems (C1, C2, C3, C12)
- c10. Classify the applications of satellites (C1, C3, C5, C12, C16).
- c11. Calculate Satellite link path loss (C1, C4, C5, C10, C12)
- c12. Review the TV receiving satellite system and identifying the main used components (C1, C5, C10)
- c13. Understand the concept of mobile communications (C1, C2, C5).
- c14. Plan the cellular network used in mobile communications (C1, C3, C8, C16)

This course contributes in the following program competencies: **C1, C2, C3, C4, C5, C6, C8, C10, C12, C13, C14, C16 & C18**

3 – Contents

Week	Topic	Lecture hours	Tutorial hours	Practical hours
1	Introduction to signals and measurement of its size and essential bandwidth	3	1	2
	<ul style="list-style-type: none"> ➤ Parametrs affecting the performance of the communication system ➤ Fourier Series and Fourier Transform 			
2	Energy signal calculations	3	1	2
	<ul style="list-style-type: none"> ➤ Relation between the input and output signal parameters for different systems 			
	Power signal calculations and link with energy signal calculations			
3	Linear Distortions	3	1	2
4	Nonlinear Distortions	3	1	2
5	Methods to reduce the effect of noise and ISI	3	1	2
	Mini project 1: analysis and system performance evaluation due to transmission in different systems for different system parameters			
6	Introduction to multiple access techniques	3	1	2
	Spread spectrum techniques and Code Division Multiple Access (CDMA)			
7	Assessment (Mid- Term)	-	-	-
8	➤ Direct Sequence Spread Spectrum (DSSS), and DSSS-CDMA	3	1	2
9	➤ Frequency Hopping Spread Spectrum (FHSS), and FHSS-CDMA	3	1	2
10	Introduction to satellite communication systems	3	1	2
	<ul style="list-style-type: none"> ➤ Satellite orbits and orbital parameters ➤ Basic transmission concepts 			
11	Power budget calculations in satellite communication system	3	1	2
12	Satellite transponder	3	1	2
	<ul style="list-style-type: none"> ➤ Noise calculations in satellite and methods used to reduce their effect 			
13	Mini project 2: SNR calculations in the satellite communcation system	4	1	2
14	Introduction to mobile communications	4	1	3
	<ul style="list-style-type: none"> ➤ Procedures of mobile communications ➤ Cellular network and GSM structure 			
15	Designing and planning cellular network used in mobile communications	4	2	3
Total hours		45	15	30

4. Course content/Course Competencies mapping matrix

Topic	Course Competencies													
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14
Introduction to signals and measurement of its size and essential bandwidth	1	1	1											
Parameters affecting the performance of the communication system	1	1	1						1					
Fourier Series and Fourier Transform	1													
Energy signal calculations and relation between signals at the input and output for a given system	1	1												
Power signal calculations and link with energy signal calculations	1	1							1					
Linear Distortions		1	1			1								
Nonlinear Distortions		1	1			1								
Methods to reduce the effect of noise and ISI		1	1	1	1				1					
Mini project 1: analysis and system performance evaluation due to transmission in different systems	1	1	1	1	1	1			1					
Introduction to multiple access techniques	1	1	1			1	1	1	1					
Spread spectrum techniques and Code Division Multiple Access (CDMA)	1	1	1			1	1	1						
DSSS, and CDMA	1	1	1	1	1	1	1	1						
FHSS, and CDMA	1	1	1	1		1	1	1						
Introduction to satellite communication systems							1		1	1		1		
Satellite orbits, orbital parameters and basic transmission concepts		1	1							1	1	1		
Power budget calculations in satellite communication system			1		1				1		1			
Satellite transponder, Noise calculations, and methods to reduce its effect			1						1			1		
Mini project 2: SNR calculations in the satellite communication system			1	1	1				1		1			
Introduction to mobile communications, procedures, cellular network, and GSM structure			1						1				1	
Designing and planning cellular network used in mobile communications			1	1					1				1	1
Topics Covering Competencies	10	13	16	6	5	7	5	4	11	2	3	3	2	1

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	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
c5		1				1			1			1			
c6	1	1	1	1	1					1	1		1	1	
c7	1	1		1	1	1	1		1	1	1	1		1	
c8	1	1		1			1			1	1		1	1	
c9	1	1	1	1	1	1		1	1	1	1	1	1		
c10		1					1	1		1					
c11	1	1		1	1					1	1		1		1
c12		1				1		1	1			1		1	
c13	1	1	1	1		1	1		1	1	1	1			
c14	1	1		1	1					1	1				
Σ	11	14	5	11	7	5	5	3	5	12	11	5	6	4	4

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes per semester	15
	Discussions and seminars	Once per semester	5
	Remarkably achievements	Weekly	Bonus (5)
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: Communications (4) “Theoretical part” and Communications (4) “Practical part”

7-2 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

7-3 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

7-4 Periodicals, Web sites, etc.

(2778) Modern Academy for Engineering & Technology - YouTube, (Last accessed March, 2021)

<https://eng.synceg.net/>, (Last accessed March, 2021)

www.ni.com/en-lb/innovations/wireless/software-defined-radio.html, Last accessed December 15, 2018, (Last accessed March, 2021)

8- Facilities required for teaching and learning:

- Computer Lab. Installed with LabView program, with a network to connect between the computer devices, Software Defined Radio (SDR) system, and Advanced communications lab (for hardware experiments)
- Lecture and Exercise rooms equipped with Computer, Data show and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Shaimaa ElSayed Ibrahim

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

Date: August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification

ELCn461: Project-2 b

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:	August 2020

B - Basic Information

Title: Project-2 b	Code: ELCn461	Level: 4 th Spring	
Credit Hours: 2	Lectures: 2	Tutorial/Exercise: -	Practical: 2
	Pre-requisite: ELCn460		

C - Professional information

1 – Course Learning Objectives:

Provides an opportunity for students to apply concepts, rules, methods and techniques learned in their undergraduate education toward a realistic communications engineering project. The main objectives of the graduation project are:

1. To make the students understand and practice the basic concepts of engineering design for multidisciplinary communications engineering project.
2. To expose the students to group learning and teamwork by working on a multidisciplinary project.
3. To improve the oral and written communication skills of the students
4. To make students capable of integrated project planning, scheduling, and cost analysis for communications engineering project.
5. To let the students demonstrate their abilities in all Student Outcomes Competences as prescribed by the Communications Engineering department.

2 – Competencies

- c1- Develop the capability to work independently with a problem-solving orientat. (C3, C6)
- c2- Analyze, design and implement a solution to a real-world problem. (C2, C11)
- c2- Analyze, design and implement a solution to a real-world problem (C2, C11)
- c3- Demonstrate adequate knowledge to proceed with the studies at the graduate level. (C2, C11)
- c4- Apply relevant ethical concepts during the course of the project. (C13, C17)
- c5- Designe and test hardware and software realization of project blockdiagram decided in part-1 (C6, C11)
- c6-Professional-quality written reports and presentations covering all aspects and phases of an engineering project. (C13, C17)

This course contributes in the following program competencies: **C2, C3, C6, C11, C13 & C17.**

3. Contents

Week No.	Topics	Lecture hours	Practical hours
1	Schedule for the project	2	1
2	Software and Hardware Realization of blockdiagram decided in part-1	2	1
3		2	1
4		2	1
5		2	1
6		2	1
7		2	1
8		2	1
9		2	1
10		How to write a technical report	2
11	2		1
12	2		1
13	2		1
14	How to defend the technical report in front of a committee and be able to answer questions asked by the committee members	2	1
15		2	1
Total		30	15

4. Course content/Course Competencies mapping matrix:

Topics	Competencies					
	c1	c2	c3	c4	c5	c6
Schedule for the project	1					
Software and Hardware Realization of blockdiagram decided in part-1		1	1	1	1	1
How to write a technical report					1	
How to defend the technical report in front of a committee and be able to answer questions asked by the committee members						1
Σ	1	1	1	1	2	2

5 - Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
c1	1		1				1				1				
c2	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	1		1			1	1
c6	1	1	1			1			1		1			1	
Σ	9	2	2	8	7	6	8	4	9	8	8	6	8	3	1

6- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work	Participation every Week	30
	3 Reports	30
Final Discussion Comette	Internal Examiners	10
	External Exminers	20
Total		100

7- List of references:

7-1 Course notes: Non

7-2 Required books

- Dependent on project title

7-3 Recommended books

- Dependent on project title

7-4 Recommended Web Site

- Dependent on project title

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Nelly Muhammad Hussein

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August 2020

Course Specification
ELCn433: Communication Network

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:	August 2020

B - Basic Information

Title: Communication Network	Code: ELCn433	Level: 4th Spring	
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 2	Practical: -
	Pre-requisite: ELCn321		

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should have gained the planned competences (knowledge, skills and attitudes) related to understanding of the fundamental concepts of computer networking, They should understand the construction of network standards and protocols. They should compete to design, implement, and analyze communication networks. to enable them to understand the principles of error control, data compression , network security, switching and protocols of the Internet.

2 – Competencies

- c1- Classify and compare the fundamentals of data communication and communication networks. (C8, C15)
- c2- Explain the construction, of basic network devices, architecture, topologies and interfaces. (C8, C15)
- c3- Explain the theoretical background needed to calculate and analyze the properties of communication channels, and how to increase its utilization efficiency by applying multiplexing techniques (C8, C15)
- c4- Classify and compare principles of operation, and performance of error control mechanisms, the concept of parity and forward error correction (C5, C15)
- c5- Classify and compare the basics of data compression and the most popular techniques, . Deduce the principles of the packet transmitted by the sending computer may pass through several LANs or WANs before reaching the destination computer for this level of communication, a global addressing scheme; we called this logical addressing to make the computers communicate through the Internet (C5, C8, C15)
- c6- Investigate the effect of the security of networked data using state of the art mechanisms (C5, C8, C15).
- c7- Calculate and analyze the resulting of art network design techniques, and factors that should be taken into consideration to minimize cost and maximize reliability (C5, C8, C15)
- c8- Classify and compare the different ways of the structure of the Internet, its history, evolution and how packets are routed within enormous network (C3, 13, C17)
- c9- Deduce mathematical relations describing the best network topology and structure that meets certain cost and performance requirements (C3, C17)
- c10- Calculate and analyze the steady state performance to 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. (C5, C15)
- c11- Classify and compare the different ways of data communication and communication network techniques to design and evaluate new protocols, & be able to discuss about security issues and the Internet& learn totally how devoted to switching in the network . (C3, C5, and C8)

This course contributes in the following program competencies: **C3, C5, C8, C13 ,C15 & C17)**

3. Contents

Week	Topics	Lecture hours	Tutorial hours	Practical hours
1	Introduction , data communications	2	2	
2	<i>Transmission Principles Media</i>	2	2	
3	Network Models	3	3	
4	Multiplexing Techniques: TDM, FDM, and CDMA.	2	2	
5	Wired LANs: Ethernet	2	2	
6	Network Layer Logical Addressing	3	3	
7	Assessment (Mid- Term)	-	-	-
8	Error detection and correction	3	3	
9	Network Layer: Internet Protocol	3	3	
10	Switching.	2	2	
11	Network Layer: Routing	3	3	
12	Data Security Techniques.	3	3	
13	Network Design Techniques.	2	2	
14	The Internet.	2	2	
15	Revision	1	1	
Total hours		30	30	-

4. Course content/Course Competencies mapping matrix:

Topics	Competencies										
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11
1- Introduction , data communications	1	1						1			
2- <i>Transmission Principles Media</i>	1	1						1			
3- Network Models	1								1		
4- Multiplexing Techniques: TDM, FDM, and CDMA.			1							1	
5- Wired LANs: Ethernet		1			1						1
6- Network Layer Logical Addressing					1					1	1
7- Error detection and correction				1							1
8- Network Layer: Internet Protocol											1
9- Switching.							1				1
10- Network Layer: Routing					1			1			1
11- Data Security Techniques						1				1	1
12- Network Design Techniques										1	1
13-The Internet.											1
Topics Covering Competencies	3	3	1	1	3	1	1	3	1	4	9

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1		1		
c4				1	1	1			1	1	1				
c5	1			1	1	1			1	1	1				
c6				1	1	1			1	1	1			1	
c7	1	1	1				1		1	1	1				
c8		1		1	1		1	1	1		1			1	1
c9	1			1	1				1	1	1			1	
c10						1	1		1						
c11						1	1		1						
Σ	6	2	2	8	7	5	7	4	8	8	9	-	3	3	1

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	Quizzes	10
	Tutorials	Assignments & reports & mini project	30
	Written Exam	Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: ppt & pdf for the lectures

7-2 Required books

Behrouz A. Forouzan, **Data communication & Networking**", 4rd Edition, MC Graw Hill, 2007.

7-3 Recommended books

William Stallings, DATA AND COMPUTER COMMUNICATIONS, 8th Edition, Person Printec Hall,

Leon-Garia, **Communication Network**, 2nd Edition Wijaja, MC Graw Hill, 2000.

Recommended Web Site

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

<https://netcad>

8- Facilities required for teaching and learning:

Lecture and Exercise rooms equipped with projection and sound systems.

High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Eman Gaber Ahmed

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn434: Mobile 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: August, 2020

B - Basic Information

Title: Mobile Communications **Code:** ELCn434 **Level:** 4th Spring
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 2 **Practical:** -
Pre-requisite: ELCn321

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 – Competencies

- c1- Review the progress of mobile generations beginning from 1G leading to 4G. (C3, C8)
- c2- Identify the cellular concept of mobile system. (C3, C8)
- c3- Investigate the basics and architecture of Global System for Mobile GSM. (C5, C8)
- c4- Study the effect of multipath fading on wireless digital transmission. (C5, C15)
- c5- Review the principles of spread spectrum especially CDMA technique. (C3, C16, C17)
- c6- Study how 4G could overcome fading distortion. (C3, C8, C16)
- c7- Plan any mobile covered area with cellular concept. (C5, C17)
- c8- Determine frequency range corresponding to each mobile generation. (C16, C17)
- c9- Choose the suitable locations for each item of GSM network architecture. (C8, C17)
- c10- Determine suitable frequency ranges gain. (C3, C5, C16)
- c11- Find optimum cellular distribution for mobile network given specific region parameters. (C16, C17)
- c12- Calculate received power at different points of the area covered by mobile network. (C3, C8)
- c13- Find estimated QOS factor and BER based on a specific communications system parameters. (C16, C17)
- c14- Use the deep understanding of the course topics in different specializations. (C5, C8)
- c15- Incorporate the knowledge of the course topics in an integrated student project (C5, C8)
- c16- Search for information in internet. (C5, C15)

This course contributes in the following program competencies: **C3, C5, C8, C15, C16 & C17.**

3. Contents

Week	Topics	Lecture hours	Tutorial hours	Practical Hours
1	Overview of mobile generations and multiple access	2	2	
2	GSM concept, channels, and cellular system.	3	3	
3	Spectrum efficiency and capacity increasing	2	2	
4	GSM architecture	6	6	
5	Traffic and control channels	2	2	
6	Types of interference in GSM	3	3	
7	Assessment (Mid- Term)	-	-	-
8	UMTS / WCDMA and spreading operation	2	4	
9	QOS support and power control	2	2	
10	Diversity in UMTS	2	2	
11	Multicarrier technology and OFDM	2	2	
12	Revolution of 4G	1	1	
13	Revision	1	1	
14	Revision	1	1	
15	Revision	1	1	
Total hours		30	30	

4. Course content/Course Competencies mapping matrix:

Topics	Competencies															
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16
7. Overview of mobile generations and multiple access techniques	1	1						1								
8. GSM concept, channels, and cellular system.	1	1						1								
9. Spectrum efficiency and capacity increasing			1						1			1		1	1	1
10. GSM architecture			1						1					1	1	1
11. Traffic and control channels				1	1						1					
12. Types of interference in GSM				1	1					1	1	1	1	1	1	1
13. UMTS / WCDMA and spreading operation										1	1					
14. QOS support and power control						1										
15. Diversity in UMTS							1			1	1					
16. Multicarrier technology and OFDM				1	1						1			1		1
17. Revolution of 4G										1	1	1	1	1	1	1
Topics Covering Competencies	2	2	2	3	3	1	1	2	2	4	6	3	2	5	4	5

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competencies	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Research, Reports & Assignments	Self-Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1		1		
c4				1	1				1	1	1		1		
c5	1			1	1				1	1	1		1		
c6				1	1				1	1	1		1	1	
c7	1	1	1				1		1	1	1				
c8		1		1	1		1	1	1		1		1	1	1
c9	1			1	1				1	1	1		1	1	
c10							1		1						
c11							1		1						
c12							1		1						
c13							1		1						
c14	1	1	1					1						1	1
c15	1	1	1					1							
c16		1	1					1							
c17	1	1	1					1						1	
c18											1		1	1	
c19	1										1		1		
∑	10	6	6	8	7		9	8	9	8	11	6	9	6	2

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	20
	Tutorials	3 Assignments per semester	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: None

7-2 Required books

Theodore S. Rappaport, Wireless communications, principles and practice, 2nd edition 1994

7-3 Recommended books

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

Recommended Web Site

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

8- Facilities required for teaching and learning:

Lecture and Exercise rooms equipped with projection and sound systems.

High speed internet and communication facilities for distance learning.

Course coordinator:

Dr. Refaat Muhammad

Head of the Department:

Prof. Dr. Shouman S. El.

Date:

August, 2020

Modern Academy

for Engineering and Technology in Maadi



Course Specification ELCn437: Satellite 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: August, 2020

B - Basic Information

Title: Satellite Communications **Code:** ELCn437 **Level:** 4th Spring
Credit Hours: 2 **Lectures:** 2 **Tutorial/Exercise:**2 **Practical:** -
Pre-requisite: ELCn321

C - Professional information

1 – Course Learning Objectives:

- Understanding the basic fundamentals of satellite systems and orbits
- Learn the basics of modulation techniques in satellite communication.
- Develop the student's skills to analyze, and design satellite communication systems.

2 – Competencies

- c1-** Identify the concepts and theories of mathematics and sciences, appropriate to the satellite engineering (C3, C8)
c2- Study the characteristics of engineering materials related to the Satellite engineering (C3, C8)
c3- Review the principles of design including elements design, process and/or a system related to specific satellite engineering. (C5, C8)
c4- Select appropriate mathematical and computer-based methods for modeling and analyzing satellite orbits problems. (C5, C15)
c5- Solve engineering problems, often on the basis of limited and possibly contradicting information. (C3, C16, C17)
c6- Create systematic and methodic approaches when dealing with new and advancing technology. (C3, C8, C16)
c7- Analyze the performance of digital and analog communication systems. (C5, C17)
c8- Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. (C16, C17)
c9- Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. (C8, C17)
c10- Practice computer programming for the design and diagnostics of digital and analog communication, mobile communication, coding, and decoding systems (C3, C5, C16).
c11- Collaborate effectively within multidisciplinary team. (C16, C17)
c12- Effectively manage tasks, time, and resources. (C3, C8)

This course contributes in the following program competencies: **C3, C5, C8, C15, C16 & C17.**

3. Contents

Week No.	Topics	Lecture hours	Tutorial hours
1	Introduction	2	2
2		2	2
3	Satellite systems	2	2
4		2	2
5	Satellite links- satellite orbits	2	2
6		2	2
7	Assessment (Mid-Term)	2	2
8	Modulation techniques in Satellite Communication systems	2	2
9		2	2
10		2	2
11	Multiple access techniques	2	2
12		2	2
13		2	2
14	Satellite systems applications.	2	2
15		2	2
Total		30	30

4. Course content/Course Competencies mapping matrix:

Topics	Competencies											
	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12
Introduction	1	1						1				
Satellite systems	1	1						1				
Satellite links- satellite orbits			1						1			1
Midterm Evaluation	1	1	1	1	1			1	1	1		
Modulation techniques in Satellite Communication systems			1						1			
Multiple access techniques				1	1						1	
Satellite systems applications.				1	1					1	1	1
Topics Covering Competencies	3	3	3	3	3			3	3	2	2	2

5 – Course Competencies/Teaching and Learning and Assessment methods:

Course Competences	Teaching Methods						Learning Methods			Assessment Method					
	Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researche, Reports & Assignments	Self Learning	Modeling and Simulation	Written Exam	Tutorials	Practical Exam	Quizzes	Research & Presentations	Mini Project Report
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	1		1		
c4	1			1	1	1			1	1	1	1	1		
c5	1			1	1	1			1	1	1	1	1		
c6	1			1	1	1			1	1	1	1	1	1	
c7	1	1	1				1		1	1	1				
c8	1	1		1	1		1	1	1		1		1	1	1
c9	1			1	1				1	1	1		1	1	
c10						1	1		1			1			
c11						1	1		1			1			
c12						1	1		1			1			
∑	9	2	2	8	7	6	8	4	9	8	8	6	8	3	1

6- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7 th Week	20
Semester Work	Quizzes	3 Quizzes (one each 4 weeks)	20
	Tutorials	3 Assignments per semester	20
Written Exam		Sixteenth week	40
Total			100

7- List of references:

7-1 Course notes: None

7-2 Required books

- Pelton, Joseph N., "Wireless & Satellite Telecommunications: The Technology, the Market, &the Regulations", Prentice Hall 1995

7-3 Recommended books

- Tom Logsdon, "Mobile Communication Satellites", McGraw Hill Text, February 1995
- Dennis Roddy, "Satellite Communications", McGraw Hill Text, 1995

7-4 Recommended Web Site

- <https://networkencyclopedia.com/satellite-communication-basics/>

8- Facilities required for teaching and learning:

- Lecture and Exercise rooms equipped with projection and sound systems.
- High speed internet and communication facilities for distance learning.

Course coordinator: Dr. Hazem El- Banna
Head of the Department: Prof. Dr. Shouman S. El.
Date: August, 2020

Appendix 2

شروط النجاح والتخرج وقواعد حساب التقدير

الآتي بعد مستخرج من الشق القانوني للائحة الأكاديمية الحديثة للهندسة والتكنولوجيا بالمعادي للدراسة بالساعات المعتمدة (لائحة 2020)

مادة [3]

تسري أحكام هذه اللائحة على الطلاب الجدد الذين يلتحقون بالأكاديمية بعد تاريخ التصديق عليها (مايو 2020)

مادة [5]

مدة الدراسة لنيل درجة البكالوريوس خمس سنوات موزعة على 10 فصول دراسية رئيسية ويمكن للطلاب إنهاء متطلبات الحصول على درجة البكالوريوس المذكورة في المادة (29) قبل ذلك بفصل دراسي واحد على الأكثر.

مادة [6]: مشروع التخرج

يكون المشروع مقسماً على فصلين دراسيين متتاليين ليس منهما الفصل الصيفي لجميع البرامج عدا برنامج هندسة العمارة فيتم تسجيل المشروع في الفصل الدراسي الأخير قبل التخرج.

مادة [18]

إذا انقطع الطالب عن الدراسة لمدة أقصاها ثلاثة فصول دراسية رئيسية بعذر مسبق يقبله مجلس إدارة الأكاديمية فيمكن له ان يواصل دراسته على ان تحسب له المقررات السابق له النجاح فيها ويخضع تخرجه لأية متطلبات جديدة في الفصل الذي اعيد قيده فيه.

مادة [26]: مواعيد الدراسة والقيود

يقسم العام الدراسي بالأكاديمية إلى ثلاثة فصول دراسية على النحو التالي:

- (أ) الفصل الدراسي الرئيسي الأول (الخريف): يبدأ في بداية العام الدراسي في شهر سبتمبر ولمدة لا تقل عن 14 أسبوع.
- (ب) الفصل الدراسي الرئيسي الثاني (الربيع): يبدأ عقب إجازة منتصف العام في شهر فبراير ولمدة لا تقل عن 14 أسبوع.
- (ج) الفصل الصيفي: يبدأ أواخر شهر يونيو بعد انتهاء الفصل الدراسي الثاني ولمدة لا تقل عن 7 أسابيع.

مادة [27]

شروط التسجيل للدراسة بنظام الساعات المعتمدة:

- (أ) حتى 18 ساعة معتمدة في الفصل الدراسي الرئيسي للطالب الحاصل على معدل تراكمي ≤ 2 .
- (ب) حتى 14 ساعة معتمدة في الفصل الدراسي الرئيسي للطالب الحاصل على معدل تراكمي > 2 .
- (ج) حتى 21 ساعة معتمدة في الفصل الدراسي الرئيسي للطالب الحاصل على معدل تراكمي ≤ 3 .
- (د) حتى 6 ساعات معتمدة لأي طالب في الفصل الصيفي ويمكن التسجيل حتى 9 ساعات بموافقة المرشد الأكاديمي إذا استدعت متطلبات التخرج ذلك.

ويتم إعداد خريطة للمقررات مع تقسيم المقررات على المستويات الدراسية التصاعديّة المحددة بالمادة [28]. ويتم التسجيل طبقاً لخريطة المقررات مع الالتزام بتسجيل مقررات المستويات الأدنى واستكمال التسجيل من المستويات الأعلى.

كما يتم تحصيل رسوم الخدمة التعليمية كل فصل دراسي ويكون حسابها طبقاً لعدد الساعات المعتمدة التي يسجل فيها الطالب في كل فصل دراسي، وبحد أدنى ما يقابل رسوم خدمة تعليمية لعدد 12 ساعة معتمدة، 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.

مادة [28]: مستويات الدراسة

يوضح الجدول التالي موقع الطالب ومستويات الدراسة معتمداً على عدد الساعات المعتمدة التي ينتهي الطالب من دراستها.

جدول رقم (1)

المستوى الدراسي	تعريف موقع الطالب بنظام الدراسة	نسبة عدد الساعات المعتمدة التي اجتازها الطالب
صفر	Freshman	من 0% حتى 20%
الأول	Sophomore	أكثر من 20% حتى 40%
الثاني	Junior	أكثر من 40% حتى 60%
الثالث	Senior 1	أكثر من 60% حتى 80%
الرابع	Senior 2	أكثر من 80% حتى 100%

مادة [29]

متطلبات الحصول على درجة البكالوريوس:

- (أ) الاجتياز بنجاح لمقررات مكافئة لعدد (165) ساعة معتمدة وبمعدل تراكمي لا يقل عن (2).
 (ب) النجاح في مشروع التخرج.
 (ج) اجتياز المقررات التي يكون التقييم فيها ناجح / راسب (Pass/Fail) ولا تحتسب ضمن المعدل التراكمي مثل مقررات التدريب الصيفي للمستوي صفر والمستوي الأول ، ومقررات التدريب الصناعي للمستوي الثاني والثالث.

مادة [31]

شروط التعديل والإلغاء والانسحاب وإيقاف القيد:

- (أ) يحق للطالب تغيير مقررات سجل فيها، بأخرى خلال أسبوعين من بدء الدراسة، ويحق له سحب المقرر خلال أسبوعين من بدء الدراسة مع استرداد الرسوم ولا يسري ذلك على الفصل الصيفي.
 (ب) يحق للطالب الانسحاب من المقرر خلال ثمانية أسابيع على الأكثر من بداية الدراسة بالفصلين الأول والثاني وثلاثة أسابيع على الأكثر في الفصل الصيفي وفي هذه الحالة لا ترد له الرسوم.
 (ج) 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 سداه من رسوم، ويكون هذا الانسحاب قبل انعقاد الامتحان النهائي لهذا الفصل. ويقوم بإعادة المقررات التي سجل فيها، في فصل دراسي لاحق دراسة وامتحاناً بعد سداد رسوم الخدمة التعليمية المقررة، ولا تحتسب عليه مرة رسوب.

مادة [32]

تقديرات المقررات الدراسية:

- (أ) تقدر نقاط كل مقرر على النحو الموضح بالجدول رقم (2):

جدول رقم (2)

التقدير	عدد النقاط	النسبة المئوية المناظرة
A+	4.0	97% وأعلى
A	4.0	93% حتى أقل من 97%
A-	3.7	89% حتى أقل من 93%
B+	3.3	84% حتى أقل من 89%
B	3.0	80% حتى أقل من 84%
B-	2.7	76% حتى أقل من 80%

C+	2.3	حتى أقل من 76%	73%
C	2.0	حتى أقل من 73%	70%
C-	1.7	حتى أقل من 70%	67%
D+	1.3	حتى أقل من 67%	64%
D	1.0	حتى أقل من 64%	60%
F	صفر	أقل من 60%	

مادة [33]

حساب متوسط النقاط: (GPA)

- أ) عند إعادة الطالب دراسة مقرر سبق أن حصل فيه على تقدير (F) يحتسب له التقدير الذي حصل عليه في الإعادة بحد أقصى (B+) وعند حساب المعدل التراكمي يحتسب له التقدير الأخير فقط على أن يذكر كلا التقديرين في سجل الطالب الأكاديمي.
- ب) تحسب النقاط التي حصل عليها الطالب في كل مقرر على إنها عدد الساعات المعتمدة للمقرر مضروبة في النقاط التي حصل عليها الطالب حسب جدول التقديرات المذكور بالمادة رقم [32].
- ت) يحسب متوسط نقاط أي فصل دراسي (Semester GPA)، على أنه ناتج قسمة مجموع النقاط التي حصل عليها الطالب في هذا الفصل، مقسوماً على مجموع الساعات المعتمدة لهذه المقررات.
- ث) يحسب متوسط النقاط التراكمي (Cumulative GPA) عند نهاية كل فصل دراسي على أنه ناتج قسمة مجموع كل نقاط المقررات التي درسها الطالب على مجموع الساعات المعتمدة لهذه المقررات.
- ج) متوسط النقاط التراكمي (Cumulative GPA) عند نهاية الفصل الدراسي الأخير للطالب هو الأساس في تحديد تقدير التخرج والنسبة المئوية.

مادة [34]

مراتب الشرف ومنح التفوق:

- أ) تمنح مرتبة الشرف للطالب الذي لا يقل المعدل التراكمي عن 3.3 مع تحقيق مثل هذا المعدل على الأقل خلال جميع فصول الدراسة ببرامج الساعات المعتمدة أو عند التحاقه بالدراسة من البرامج ذات الفصلين الدراسيين وذلك بعد عمل مقاصة ويشترط لمنح مرتبة الشرف ألا يكون الطالب قد حصل على تقدير (F) في أي مقرر خلال دراسته الجامعية.

مادة [35]

الإنذار الأكاديمي - الفصل من الدراسة - آليات رفع المعدل التراكمي:

- أ) إذا انخفض المعدل التراكمي للطالب إلى أقل من (2) في أي فصل دراسي يوجه له إنذار أكاديمي يقضي بضرورة رفع الطالب لمعدله التراكمي إلى (2) على الأقل.
- ب) يُفصل الطالب المنذر أكاديمياً من الدراسة ببرامج الساعات المعتمدة إذا تكرر انخفاض معدله التراكمي عن (2) لمدة ستة فصول دراسية رئيسية متتابعة.
- ت) إذا لم يحقق الطالب شروط التخرج خلال الحد الأقصى للدراسة وهو عشر سنوات يتم فصله.
- ث) يجوز لمجلس الأكاديمية أن ينظر في إمكانية منح الطالب المعرض للفصل نتيجة عدم تمكنه من رفع معدله التراكمي إلى (2) على الأقل فرصة واحدة وأخيره مدتها فصلين دراسيين رئيسيين لرفع معدله التراكمي إلى (2) وتحقيق متطلبات التخرج إذا كان قد أتم بنجاح دراسة 80% من الساعات المعتمدة المطلوبة للتخرج على الأقل.
- ج) يجوز للطالب إعادة دراسة المقررات التي سبق نجاحه فيها بغرض تحسين المعدل التراكمي وتكون الإعادة دراسة وامتحانا ويُحتسب له التقدير الأعلى وذلك بحد أقصى 5 مقررات إلا إذا كان التحسين

لغرض رفع الإنذار الأكاديمي أو تحقيق متطلبات التخرج وفي جميع الأحوال يُذكر كلا التقديرين في سجله الأكاديمي.

مادة [37]

أسلوب تقييم الطالب:

- (أ) يعقد لكل مقرر امتحان تحريري في منتصف الفصل الدراسي لا تقل درجته عن 20% من مجموع درجات المقرر.
- (ب) يعقد لكل مقرر امتحان تحريري في نهاية الفصل الدراسي لا تقل درجته عن 40% من درجات المقرر، مع وضع القواعد والشروط المنظمة والتي تؤكد على وجوب حصول الطلاب على نسبة لا تقل عن 40% في الامتحان التحريري من إجمالي درجته، لكي يعد ناجحاً حتى لو كان مجموع درجاته في المقرر أعلى من الحد الأدنى للنجاح. وفي حالة رسوب الطالب لهذا السبب يسجل (FF) أي راسب لرسوبه في الامتحان التحريري.
- (ت) يضع مجلس الأكاديمية القواعد المنظمة لتوزيع درجات أي مقرر طبقاً لطبيعته على النحو التالي: الامتحانات الدورية السريعة (عددها ودرجة كل منها)، الأعمال الإضافية التي يقوم بها الطالب، التقارير المقدمة عن أبحاث قام بإعدادها، الاختبارات العملية، الامتحان النهائي للمقرر.
- (ث) مدة الامتحان التحريري النهائي لا تقل عن ساعتين ويحدد مجلس الأكاديمية مدة الامتحان لكل مقرر حسب طبيعته.
- (ج) يعد الطالب راسباً إذا كان مجموع درجاته في المقرر أقل من 60% أو لم يحضر الامتحان التحريري في نهاية الفصل الدراسي لحرمانه من الدخول لتجاوز نسبة الغياب أو بقرار تأديبي. وفي حالة عدم أداء الطالب للامتحان النهائي للفصل الدراسي بعذر تقبله الأكاديمية يسمح للطالب إعادة تسجيل المقرر دراسة وامتحاناً مع احتساب التقدير الذي يحصل عليه كاملاً.
- (ح) تقيم بعض المقررات مثل التدريب العملي للمستوى صفر والمستوى الأول، والتدريب الصناعي للمستوى الثاني والثالث على أساس ناجح / راسب (Pass/Fail) ولا تدخل في حساب المعدل التراكمي.
- (خ) يتم توثيق قرارات مجلس الأكاديمية المفسرة لهذه المادة في لائحة تنفيذية ملزمة ومعلنة.

مادة [38]

نسبة الحضور والحرمان من الامتحان والأعدار:

- (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).
- (ب) يحق لمجلس الأكاديمية حرمان الطالب من التقدم للامتحان كله أو في بعض المقررات إذا رأى أن انتظامه غير مرضي طبقاً لأحكام اللائحة الداخلية. وفي هذه الحالة يعتبر الطالب راسباً في المقررات التي حرم من التقدم للامتحان فيها.

جدول رقم (3)

مفتاح الكود	N ₁	N ₂	N ₃	L ₁	L ₂	L ₃
-1	L ₁	L ₂	L ₃	ثلاثة حروف ترمز إلى القسم والتخصص المسئول عن تدريس المقرر		
ARC	قسم العمارة					
CMP	قسم الحاسبات					
ELC	قسم الاتصالات					
MTH	تخصص الرياضيات قسم العلوم الأساسية					
PHY	تخصص الفيزياء قسم العلوم الأساسية					
MEC	تخصص الميكانيكا قسم العلوم الأساسية					
CHE	تخصص الكيمياء قسم العلوم الأساسية					

قسم هندسة التصنيع	MNF
تخصص المواد الإنشائية وتتبع وكيل الأكاديمية إشرافيا	GEN
N ₁ -2 رقم يرمز إلى المستوى التي تدرس به المادة	
N ₁ = 1	المستوى الأول
N ₁ = 2	المستوى الثاني
N ₁ = 3	المستوى الثالث
N ₁ = 4	المستوى الرابع
N ₁ = 5	المستوى الخامس
N ₂ -3 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 إنشائية إجبارية
N ₂ = 5	مادة إنشائية اختيارية
N ₂ = 6	المشروع والندوات والتدريب الصناعي
N ₃ -4 رقم يرمز إلى مسلسل المقرر داخل التخصص	