

Manufacturing Engineering and Production Technology B.Sc. Program Specification, By Law 2018

December 2018

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مقدمة

الهندسة هي المعرفة بالعلوم الطبيعية والرياضية، والتي تكتسب بالدراسة والخبرة والممارسة، وتطبق بوعي لتطوير أساليب تُستخدم اقتصادياً لتطوير المواد وقوى الطبيعة لصالح البشرية. وهي أيضاً المقدرة 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 الهندسة في إعداد الأفراد لتقديم خيارات مدروسة في إطار كونهم مستهلكين أو عمالاً أو مواطنين وأعضاء في المجتمع الدولي. وينبغي أن يحقق التعليم الهندسي التميز والتفوق في التعليم العالي والدراسات العليا والبحوث، والخدمة العامة، وتطوير المعارف الهندسية. ويهدف التعليم الهندسي 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 قوميًا وإقليميًا ودوليًا. كما يهدف أيضاً إلى إعداد الطلبة لمهنة منتجة ومفيدة في المجال الهندسي مبنية على أسس أخلاقية ومعنوية قوية.

ويختص المهندسون بحل المشاكل الواقعية، ويعملون على إيجاد أفضل الحلول لها عن طريق تطبيق مجمل معارفهم وخبراتهم ومهاراتهم. كما يساعد المهندسون على تعريف وتحسين نمط الحياة بتوفير وسائل حياتية ذات أداء عالي مبتكر، أكثر أماناً وملائمة للاستعمال اليومي. كما يسعون إلى التطوير من خلال الاختراع والتصميم والتصنيع والبناء. كما تهدف مجمل الأنشطة الهندسية إلى الحصول على نتائج إيجابية لتحسين المعيشة بيد أن 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 تُحل 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 تعليمًا فعالاً ومبنيًا على أسس تكنولوجية، أخذًا في الاعتبار التوقعات المستقبلية للعلم والتكنولوجيا. وهي أيضاً توفر المعارف التقنية والمهارات الضرورية لحل المشاكل التي تسمح بمواجهة التحديات المستقبلية. وتحدد المعايير الأكاديمية المرجعية القومية (NARS) للهندسة مفاهيمًا 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 تلبي الاحتياجات الفعلية لسوق العمل.

وقد تم تصميم برنامج هندسة التصنيع وتكنولوجيا الإنتاج لإعداد المهندسين المتميزين في مجالات التصميم الميكانيكي وتكنولوجيا الإنتاج إضافة إلى هندسة التصنيع التي تدرس من خلال مجموعة من المقررات التمييزية والتي تعطى لخريج البرنامج تأهيلاً متميزاً مقارنة بخريجي البرامج المثيلة لسد احتياجات سوق العمل. كما تم إعداد مواصفات البرنامج بتعاون جاد وأداء احترافي لنخبة متميزة من أعضاء هيئة التدريس المتخصصين في مجالات مقررات البرنامج.

وقسم هندسة التصنيع وتكنولوجيا الإنتاج إذ يقدم هذه الوثيقة الهامة فإنه يتقدم بالشكر لجميع أعضاء هيئة التدريس الذين تضاعفوا جهودهم لإنجازها كما يقدم الشكر والتقدير لمكتب الجودة الأكاديمية الذي وفر الخبرات اللازمة والتدريب والاستشارات لإنجاز مواصفات البرنامج.

أ.د. نبيل عبد الحميد جاد الله
رئيس قسم هندسة التصنيع وتكنولوجيا الإنتاج

والله ولي التوفيق،
قسم هندسة التصنيع

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Manufacturing Engineering and Production Technology

B.Sc. Program Specifications

1. General

1.1. Basic Information

Program Title: Manufacturing Engineering and Production Technology B Sc Program
Program Type: Single
Department offering the program: Manufacturing Engineering and Production Technology Department
Coordinator: Professor Nabil Abdelhamid Gadallah
Assistant Co-ordinator:
External Evaluator/s: Prof. Dr Tawfik Tawfik M. El-Midani, Professor of Production Engineering, Production Engineering and Mechanical Design Department, Faculty of Engineering, Mansoura University. Prof. Dr Fatheya Abdel Hady Soliman, Emeritus Professor –Mechanical Design & Production Department, Faculty of Engineering, Cairo University.
Academic Standard: The current program fulfills the requirements of the ARS for the Manufacturing Engineering and Production Technology BSc program, approved by the National Authority for Quality Assurance and Accreditation in Education (NAQAAE), First Edition on July, 2015.
Total Credit Hours: 180
Total Contact Hours: 278
Program Started on: 2018-2019
Dates of program specifications approval: 24/09/2018

1.2. Staff Members

The Manufacturing Engineering and Production Technology BSc Program is taught by 32 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. Program External Reviewing

The program specifications were evaluated by two external evaluators. Their evaluation showed that the program specifications agree with the National Academic Reference Standards. However, the reviewers gave objective comments, which were considered in the final version of the program specifications. The reviewers' reports and response to their comments are printed in separate volume.

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 engineer's problem-solving complexity grows as the world's social and technological problems become more closely related. 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.

Mechanical engineers should be curious about how things are made and work. They have a desire to solve problems and a talent for understanding the operation of mechanical devices. Mechanical engineers conceive, plan, design and direct the production, distribution and operation of a wide variety of devices, machines and systems, environmental control and materials processing, transportation and handling. Manufacturing engineering and production technology program graduates analyze their design using the principles of motion, energy, and momentum to insure that the product functions safely, efficiently, reliably, and manufactured at a competitive cost with minimized environmental hazards.

Mechanical engineering; Manufacturing Engineering and Production Technology, is a broad discipline which covers the fields of solid and fluid mechanics, thermodynamics, mechanical engineering design, production technology, economics and production management. Basic studies are devoted to mechanical properties of materials, machine design, dynamics and control, instrumentation, fundamentals of fluid flow, energy and power systems. Mechanical Engineering covers the design, analysis, testing and manufacturing of products that are used in every facet of modern society. Production Engineering covers the principles of manufacturing technology, metal cutting analysis, CNC programming and machine tools, flexible manufacturing systems, Computer Integrated Manufacturing, Automation of Production Lines, Advanced Manufacturing Technology,

and Production Planning and Control. Undergraduate educational programs in mechanical engineering design and production are, therefore, specifically designed to provide a wide variety of topics. These include power systems, fluid and thermal sciences related to discipline, automatic control, reliability, quality assurance and control, mechanical design and manufacturing.

The current program fulfills the requirements of the ARS for the Manufacturing Engineering and Production Technology BSc program, approved by the National Authority for Quality Assurance and Accreditation in Education (NAQAAE), First Edition, July 2015.

A BSc. degree in Manufacturing Engineering and Production 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.

Manufacturing Engineering and Production Technology engineer may work in: private and governmental firms, where it is required to design, manufacture. Operate, develop, or maintain mechanical systems and production lines. The graduate is able to work in industries using flexible manufacturing systems where CNC machines are introduced and advanced non-traditional metal processing technology. The graduate is also ready for participating in production planning and control in the different engineering industries such as automotive, aerospace, power engineering equipment and iron and steel industries.

2.2. Program Mission and Aims

2.2.1. Program mission

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

2.2.2. Program aims

The manufacturing engineering and production technology program aims at providing future engineers with appropriate theoretical knowledge and technical skills to respond to professional market demands in the fields of mechanical design and, production technology.

2.2.3. The Aimed Graduate Attributes

On successful completion of the program, the graduates of the manufacturing engineering and production technology engineering program should be able to:

- a) Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.
- b) Design a system; component and process to meet the required needs within realistic constraints.
- c) Design and conduct experiments as well as analyze and interpret data.
- d) Identify, formulate and solve fundamental engineering problems.
- e) Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
- f) Work effectively within multi-disciplinary teams.
- g) Communicate effectively.
- h) Consider the impacts of engineering solutions on society & environment.
- i) Demonstrate knowledge of contemporary engineering issues.
- j) Display professional and ethical responsibilities; and contextual understanding
- k) Engage in self- and life- long learning.
- l) Work with mechanical design and manufacturing systems.
- m) Use of mathematics and physical and engineering sciences and systems analysis tools in components and machines and produce design and manufacture.
- n) Use different instruments appropriately and carry-out experimental design, automatic data acquisition, data analysis, data reduction and interpretation, and data presentation, both orally and in the written form.
- o) Use the computer graphics for design, communication and visualization.
- p) Use and/or develop computer software, necessary for the design, manufacturing and management of industrial systems and projects.

- q) Analyze multi-disciplinary mechanical, electrical, thermal and hydraulic systems.
- r) Lead or supervise a group of designers or technicians and other work force.
- s) Apply the principles of production processes with classic and up-to-date technologies in manufacturing and testing.
- t) Use advanced technologies and instrumentation in measurements and data analysis.
- u) Underlining the key roles of safety dimensions, sustainable technology, environmental friendliness, and cleaner production measures in manufacturing, materials, managerial and economic alternatives.
- v) Demonstrate the ability to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy

2.2.4. Graduate Career Opportunities

Manufacturing Engineering and Production Technology engineer may work in: private and governmental firms, where it is required to design, manufacture. Operate, develop, or maintain mechanical systems and production lines. The graduate is able to work in industries using flexible manufacturing systems where CNC machines are introduced and also advanced non-traditional metal processing technology. The graduate is also ready for participating in production planning and control in the different engineering industries such as automotive, aerospace, power engineering equipment and iron and steel industries.

2.3. Intended Learning Outcomes (ILO's)

2.3.1. Knowledge and Understanding

On successful completion of the program, the graduates of the manufacturing engineering and production technology engineering program should demonstrate the knowledge and understanding of:

- A1. Concepts and theories of mathematics and sciences, appropriate to the discipline.
- A2. Basics of information and communication technology (ICT).
- A3. Characteristics of engineering materials related to the discipline.
- A4. Principles of design including elements design, process and/or a system related to specific disciplines.
- A5. Methodologies of solving engineering problems, data collection and interpretation.
- A6. Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
- A7. Business and management principles relevant to engineering.
- A8. Current engineering technologies as related to disciplines.
- A9. Topics related to humanitarian interests and moral issues.
- A10. Technical language and report writing.
- A11. Professional ethics and impacts of engineering solutions on society and environment.
- A12. Contemporary engineering topics.
- A13. Concepts, principles and theories relevant to Mechanical Engineering and manufacture.
- A14. The constraints within which his/her engineering judgment will have to be exercised.
- A15. The specifications, programming and range of application of CAD and CAD/ CAM facilities.
- A16. Relevant contemporary issues in mechanical engineering.
- A17. Basic electrical, control and computer engineering subjects related to the discipline.
- A18. The role of information technology in providing support for mechanical engineers.
- A19. Engineering design principles and techniques
- A20. Management and business techniques and practices appropriate to engineering industry.
- A21. Advanced technologies for manufacturing, automation and product testing.
- A22. Computer numerically controlled machines used in manufacturing.
- A23. Impact of new manufacturing technologies on the society and environment.
- A24. New materials used in industry, their structures, mechanical properties, and modes of failure.

2.3.2. Intellectual Skills

On successful completion of the program, the graduates of the manufacturing engineering and production technology engineering program should be able to:

- B1. Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
- B2. Select appropriate solutions for engineering problems based on analytical thinking.
- B3. Think in a creative and innovative way in problem solving and design.
- B4. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.

- B5. Assess and evaluate the characteristics and performance of components, systems and processes.
- B6. Investigate the failure of components, systems, and processes.
- B7. Solve engineering problems, often on the basis of limited and possibly contradicting information.
- B8. Select and appraise appropriate ICT tools to a variety of engineering problems.
- B9. Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
- B10. Incorporate economic, societal, environmental dimensions and risk management in design.
- B11. Analyze results of numerical models and assess their limitations.
- B12. Create systematic and methodic approaches when dealing with new and advancing technology.
- B13. Apply the principles of mathematics, science and technology in problem solving scenarios in mechanical engineering;
- B14. Analyze and interpret data, and design experiments to obtain primary data;
- B15. Evaluate and appraise designs, processes and products, and propose improvements;
- B16. Interpret numerical data and apply analytical methods for engineering design purposes
- B17. Use the principles of engineering science in developing solutions to practical mechanical engineering problems.
- B18. Select appropriate manufacturing method considering design requirements.
- B19. Apply advanced and composite material technologies in production
- B20. Use efficiently appropriate methods of measurement.
- B21. Select effectively suitable joining technology appropriate to the production process.
- B22. Identify a range of solutions and critically evaluate and justify design solutions.

2.3.3. Professional and Practical Skills

On successful completion of the program, the graduates of the manufacturing engineering and production technology engineering program should be able to:

- C1. Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.
- C2. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.
- C3. Create and/or re-design a process, component or system, and carry out specialized engineering designs.
- C4. Practice the neatness and aesthetics in design and approach.
- C5. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
- C6. Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
- C7. Apply numerical modeling methods to engineering problems.
- C8. Apply safe systems at work and observe the appropriate steps to manage risks.
- C9. Demonstrate basic organizational and project management skills.
- C10. Apply quality assurance procedures and follow codes and standards.
- C11. Exchange knowledge and skills with engineering community and industry.
- C12. Prepare and present technical reports.
- C13. Prepare engineering drawings, computer graphics and specialized technical reports and communicate accordingly.
- C14. Employ the traditional and modern CAD and CAD/CAM facilities in design and production processes
- C15. Use workshop equipment competently and safely.
- C16. Analyze experimental results and determine their accuracy and validity.
- C17. Use laboratory equipment and related computer software.
- C18. Operate and maintain mechanical equipment.
- C19. Prepare the process plan for manufacturing.
- C20. Compare, recommend and apply advanced forming and casting technologies.
- C21. Use advanced technologies in manufacturing to attain the required reliability and economy.
- C22. Use the scientific literature effectively and make discriminating use of Web resources.

2.3.4. General and Transferable Skills

The graduates of the Manufacturing engineering and production technology BSc program should be able to:

- D1. Collaborate effectively within multidisciplinary team.
- D2. Work in stressful environment and within constraints.

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

2.4. Curriculum Structure and Content

The program includes **79** courses of total **180** credit hours and **278** contact hours. These courses are classified according to the relevant sector NARS requirements to the following subject areas:

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

2.4.1. Humanities and social science courses (University Requirements)

The humanitarian courses give the following knowledge and understanding and skills

- 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 humanitarian courses are unified for all of the programs of the Modern Academy. They consist of 16 credits (8.89% of total 180 credits), which are satisfied by completing eight (8) courses:

- Six (6) compulsory courses equivalent to 12 credits (6.67%), as listed in table 1- a.
- Two (2) elective courses equivalent to 4 credits (2.22%), as listed in table 1- b.

Table 1-a Compulsory Humanitarian Courses 12 credit Hours, 6.67% of total 180 credits

Course Code	Course Title	Total Credit	Contact hours				Prerequisites	NARS Subject Areas						
			L	T	P	Total		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
GENN041	Contemporary Social Issues	2	2	-	-	2	None	2						
GENN042	English Language.	2	2	-	-	2	None	2						
GENN043	History of Engineering and Technology.	2	2	-	-	2	None	2						
GENN141	Presentation Skills.	2	2	-	-	2	None	2						
GENN142	Technical Report Writing.	2	2	-	-	2	None	2						
GENN341	Project Management.	2	2	-	-	2	None	2						
Total		12				12		12						

Table 1-b Elective Humanitarian Courses 2 credit Hours, 2.22 % of total 180 credits

Table 1.5 Elective Humanities Courses 2 Credit Hours, 2.22 % of total 100 credits															
	Course Code	Course Title	Total Credit	Contact hours				Prerequisites	NARS Subject Areas						
				L	T	P	Total		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
Elective 1	GENN351	Engineering Economy.	2	2	-	-	2	None	2						
	GENN352	Environmental Effects of Electromagnetic Waves.	2	2	-	-	2	None							
	GENN353	Engineering Laws and Professional ethics.	2	2	-	-	2	None							
	GENN354	Risk Management	2	2	-	-	2	None							
Elective 2	GENN451	Advanced Computer Systems Implementation.	2	2	1	-	3	CMPN010	2						
	GENN452	Civilization and heritage	2	2	-	-	2	None							
	GENN453	Industrial Psychology.	2	2	-	-	2	None							
	GENN454	Marketing	2	2	-	-	2	None							
Total			4				4		4						

2.4.2. Faculty/Institute requirements (Mathematics & Basic Science Courses)

Mathematics

Mathematical courses give the following knowledge and understanding and skills:

- 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 Manufacturing Engineering and Production Technology.
- The ability to analyze and model engineering components, systems and processes specific to the Manufacturing Engineering and Production Technology.
- The skill of using probability and statistical methods

Basic Sciences

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

- Acquiring knowledge of physics, chemistry, mechanics, earth sciences, biological sciences and other specific Courses 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

The Institute Requirements (Mathematics & Basic Science Courses) of the Manufacturing Engineering and Production Technology bachelor program consist of 38 credits (21.11 % of total 180 credits) as shown in table 2.

Table -2 Mathematics and Basic science courses, 36 credits, 20 % of total 180 credits

Course Code	Course Title	Total Credit	Contact hours				Prerequisites	NARS Subject Areas						
			L	T	P	Total		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
CHEN001	Chemistry.	3	2	1	2	5	None		3					
MECN001	Mechanics -1.	2	1	3	0	4	None		2					
MECN002	Mechanics-2.	2	1	3	0	4	MECN001		2					
MTHN001	Mathematics-1(Algebra and Calculus).	3	2	3	0	5	None		3					
MTHN002	Mathematics-2(Integration and Analytic Geometry).	3	2	3	0	5	MTHN001		3					
MTHN103	Math-3 (Differential Equations and Transforms)	3	2	3	0	5	MTHN002		3					
MTHN105	Math-5 (Numerical Analysis)	3	2	2	0	4	MTHN103		3					
MTHN207	Math-7 (Introduction to Probability and Statistics)	3	2	2	0	4	MTHN002		3					
MTHN209	Mathematics 9 (Applications of Advanced Calculus)	3	2	2	0	4	MTHN103		3					
PHYN001	Physics-1.	3	2	1	2	5	None		3					
PHYN002	Physics -2.	3	2	1	2	5	PHYN001		3					
MNFN001	Introduction to Engineering Materials.	1	1	0	0	1	None		1					
CMPN010	Program Design and Computer Languages.	4	2	3	2	7	None		4					
Total		36	23	27	8	58		0	36	0	0	0	0	0

2. 4. 3. Requirements of the general specialization of the program (Basic Engineering Courses)

Basic Engineering Sciences Courses give the following knowledge and understanding and skills:

- Integrating knowledge and understanding of mathematics and physical sciences to develop basic engineering laws and concepts related to the Manufacturing Engineering and Production 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.

Table -3 Basic Engineering Courses, 59 credits, 32.77 % of total 180 credits

Course Code	Course Title	Total Credit	Contact hours				Prerequisites	NARS Subject Areas						
			L	T	P	Total		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MNFN002	Engineering Graphics.	3	1	6		7	None			3				
MNFN003	Principles of Production Engineering.	3	2		3	5	None			3				
MNFN111	Mechanics of materials	3	2	3		5	MECN001			3				
MNFN112	Fundamentals of materials Science	3	2	1	2	5	MNFN001			3				
MNFN113	Mechanics of Machines-1	3	2	3		5	MECN002			3				
MNFN114	Machine Drawing-1	3	2	4		6	MNFN002, MNFN060			3				
MNFN115	Mechanics of Machines-2	3	2	3		5	MNFN113			3				
MNFN116	Machine Drawing-2	3	2	4		6	MNFN114			2		1		
MNFN211	Fluid Mechanics	3	2	1	2	5	MTHN002			2		1		
MNFN212	Computer Applications-1	3	1	4		5	CMPN010, MNFN160					3		
MNFN213	Computer Applications-2	3	2	3		5	MNFN212					3		
MNFN214	Thermodynamics	3	2	1	2	5	PHYN002			3				
ELCN216	Electro Engineering	3	2	1	2	5	PHYN002			3				
ELCN217	Electric Machines	3	2	1	2	5	ELCN216			3				
MNFN261	Seminar-1.	1	1	0	0	1	47 Credit, GENN141, GENN142			1				
MNFN262	Seminar-2.	1	1	0	0	1	MNFN261			1				
MNFN311	Mechanical Measurements	3	2	0	2	4	MNFN111				3			
MNFN312	Industrial Operation Research	3	2	2		4	None			3				
MNFN313	Automatic Control	3	2	2	1	5	MTHN103			2		1		
MNFN411	Quality Control and Quality Management	3	2	1	2	5	MTHN207							3
MNFN331	Elective-3:	3	2	1	2	5	MNFN214							3
MNFN332	a) Heat Transfer						MNFN115N							
MNFN333	b) Mechanical Vibrations						one							
	c) Production and Operations Management.													
Total		59	38	41	20	99		0	0	41	3	9	0	6

* **MNFN060:** Summer training for level zero (0 Credits).

* **MNFN160:** Summer training for level one. (0 Credits)

2. 4. 4. Requirements of the specific specialization of the program

Applied Engineering and Design

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

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

Projects & Training

The projects give the following knowledge and understanding and skills:

- Gaining the knowledge and experience of applying the different principles and techniques introduced in the program of study.
- 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.
- The ability to investigate, plan and execute technical research specific to the Manufacturing Engineering and Production Technology over an extended period of time; meeting deadlines and putting technical work in a social and commercial context.
- The ability to work in a team, search published sources of information, interprets technical data and analyzes and presents findings in various ways.

Table 4-a Compulsory Applied Engineering and design courses, 48 credits, 26.67 % of total 180 credits

Course Code	Course Title	Total Credit	Contact hours				Prerequisites	NARS Subject Areas						
			L	T	P	Total		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MNFN121	Metal Cutting Processes	3	2	1	2	5	MNFN003				3			
MNFN122	Materials Technology and Testing	3	2	1	2	5	MNFN111, MNFN112				3			
MNFN221	Metals Cutting Theory	3	2	1	2	5	MNFN121				3			
MNFN222	Machine Design-1	3	2	3	0	5	MNFN116				3			
MNFN223	Foundry Technology	3	2	1	2	5	MNFN112							3
MNFN224	Machine Design-2	3	2	3	0	5	MNFN222				3			
MNFN225	Engineering Metrology	3	2	1	2	5	MNFN121				3			
MNFN321	Joining Processes	3	2	1	2	5	MNFN112							3
MNFN322	Computer Numerical Control, CNC Machines	3	2	1	2	5	MNFN213, MNFN121				1	2		
MNFN323	Computer Aided Design (CAD)	3	2	1	2	5	MNFN224				1	2		
MNFN324	Advanced Materials and Composite	3	2	1	2	5	MNFN122				3			
MNFN325	Modern Manufacturing Methods	3	2	1	2	5	MNFN221							3
MNFN421	Computer Aided Manufacturing (CAM)	3	2	0	3	5	MNFN322				1	2		
MNFN422	Hydraulic Power Systems	3	2	2	1	5	MNFN211				2	1		
MNFN423	Production Aids Design	3	2	1	2	5	MNFN221				2	1		
MNFN424	Industrial Thermal Systems	3	2	1	2	5	MNFN214				2	1		
Total		48	32	20	28	80		0	0	0	30	9	0	9

Table 4-b Elective Applied Engineering and design courses, 6 credits, 3.33 % of total 180 credits)

Course Code	Course Title	Total Credit	Contact hours				Prerequisites	NARS Subject Areas						
			L	T	P	Total		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MNFN431 MNFN434 MNFN438	Elective-4: a) Modeling and Simulation b) Automation in Production and CIM c) Advanced casting techniques.	3	2	1	2	5	MNFN213 MNFN421 MNFN223				2	1		
MNFN430 MNFN435 MNFN437	Elective-5: a) Advanced Forming Techniques b) Advanced Facility Planning c) Electro- Hyd. and Pneumatic Systems	3	2	1	2	5	MNFN122 MNFN312 MNFN313 MNFN422				3			
Total		6	4	2	4	10	3.33 %				5	1		

Table 4-c Projects and Industrial Training courses 15 credits, 8.33 % of total 180 credits

Course Code	Course Title	Total Credit	Contact hours				Prerequisites	NARS Subject Areas						
			L	T	P	Total		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MNFN361	Project-1	3	2	0	3	5	MNFN262						3	
MNFN260	Industrial Training(1)	3	0	0	0	0	65 Credit						3	
MNFN461	Project-2a	2	1	0	3	4	MNFN361						2	
MNFN360	Industrial Training(2)	3	0	0	0	0	101 Credit+ MNFN260						3	
MNFN462	Project-2b	4	3	0	3	6	MNFN461						4	
Total		15	6	0	6	15		0	0	0	0	0	15	0

2. 4. 5. CONFORMITY TO THE (SCU) AND NARS REQUIREMENTS

The Manufacturing Engineering and Production Technology BSc program includes 79 courses of total 180 credit hours, equivalent to **278** contact hours (the contact hours of summer trainings are not included). These courses are classified according to the requirements of the engineering sector of the supreme council of Universities (SCU) to the following subject areas:

- 1) General cultural courses requirements (University Requirements) (8-10%)
- 2) Faculty/Institute requirements (15-20%)
- 3) Requirements of the general specialization of the program (Basic Engineering Courses) (30-35%)
- 4) Requirements of the specific specialization of the program (35-40%)

The program credit hours were also classified according to the NARS to following subject areas:

- 1) Humanities and Social Sciences (9-12 %)
- 2) Mathematics and Basic Sciences (20-26 %)
- 3) Basic Engineering Sciences (20-23 %)
- 4) Applied Engineering and Design (20-22 %)
- 5) Computer Applications and ICT* (9-11 %)
- 6) Projects* and Practice (8-10 %)
- 7) Discretionary (Institution character-identifying) subjects (6-8 %)

The collective credit hours are shown in Table 5e. This table shows that the Credit hours' distribution of the Manufacturing Engineering and Production Technology BSc program agrees with the requirements of the

Engineering Sector of the Supreme Council of Universities (SCU) as well as the requirements of the National Authority for quality assurance and accreditation in Education. Table 5 shows that the program structure satisfies both of the SCU and NARS requirements.

Table 5, Distribution of the programs credit hours over the SCU and NARS subject areas

		NARS Subject Areas						Total Credit Hours	Percentage	Requirements of the Engineering Sector Committee
		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice			
SCU Subject Areas	University Requirements (General cultural courses requirements)	16						16	8.89	8-10%
	Faculty/Institute requirements (Mathematics & Basic Science Courses)		36					36	20.00	15-20%
	Requirements of the general specialization of the program (Basic Engineering Courses)	0	0	41	3	9	0	59	32.78	30-35%
	Requirements of the specific specialization of the program (Applied Engineering and Design)				35	10	15	69	38.33	35-40%
Total Credit Hours		16	36	41	38	19	15	180		
Percentage		8.89	20.00	22.78	21.11	10.56	8.33		100%	
NARS Engineering Requirements		9-12%	20-26%	20-23%	20-22%	9-11%	8-10%	6-8%		

2. 4. 6. A SAMPLE STUDY PLAN

First Semester (Level Zero)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MTHN001	Math-1 (Algebra and Calculus)	3	2	3	-	5
PHYN001	Physics-1	3	2	1	2	5
MNFN002	Eng. Graphics	3	1	6	-	7
CHEN001	Chemistry	3	2	1	2	5
MECN001	Mechanics-1	2	1	3	-	4
GENN041	Contemporary Social Issues	2	2	-	-	2
GENN043	History of Engineering and Technology	2	2	-	-	2
Total		18	12	13	4	29

Second Semester (Level Zero)

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

Summer Training

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN060	Summer Training-1	0	-	-	0	0
	Total	0	-	-	0	0

Third Semester (Level One)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MTHN103	Math-3 (Differential Equations and Transforms)	3	2	3	-	5
MNFN111	Mechanics of materials	3	2	3	-	5
MNFN112	Fundamentals of materials Science	3	2	1	2	5
MNFN113	Mechanics of Machines-1	3	2	3	-	5
GENN141	Presentation Skills	2	2	-	-	2
MNFN114	Machine Drawing-1	3	2	4	-	6
	Total	17	12	14	2	28

Fourth Semester (Level One)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MTHN105	Math-5 (Numerical Analysis)	3	2	2	-	4
MNFN115	Mechanics of Machines-2	3	2	3	-	5
MNFN122	Materials Technology and Testing	3	2	1	2	5
MNFN121	Metal Cutting Processes	3	2	1	2	5
GENN142	Technical Report Writing	2	2	-	-	2
MNFN116	Machine Drawing-2	3	2	4	-	6
MNFN261	Seminar-1	1	1	-	-	1
Total		18	13	11	4	28

Summer Training

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN160	Summer Training-2	0	-	-	0	0
Total		0	-	-	0	0

Fifth Semester (Level Two)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MTHN207	Math-7 (Introduction to Probability and Statistics)	3	2	2	-	4
MNFN211	Fluid Mechanics	3	2	1	2	5
MNFN221	Metal Cutting Theory	3	2	1	2	5
MNFN212	Computer Applications-1	3	1	4	-	5
MNFN222	Machine Design-1	3	2	3	-	5
ELCN216	Electro Engineering	3	2	1	2	5
Total		18	11	12	6	29

Sixth Semester (Level Two)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MTHN209	Mathematics 9 Applications of Advanced Calculus	3	2	2	-	4
MNFN223	Foundry Technology	3	2	1	2	5
MNFN213	Computer Applications-2	3	2	3	-	5
MNFN224	Machine Design-2	3	2	3	-	5
MNFN214	Thermodynamics	3	2	1	2	5
ELCN217	Electric Machines	3	2	1	2	5
Total		18	12	11	6	29

Summer Training

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN260	Industrial Training (1)	3	-	-	-	-
Total		3	-	-	-	-

Seventh Semester (Level Three)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN262	Seminar-2.	1	1	-	-	1
MNFN225	Engineering Metrology	3	2	1	2	5
MNFN311	Mechanical Measurements	3	2	-	2	4
MNFN321	Joining Processes	3	2	1	2	5
MNFN322	Computer Numerical Control (CNC) Machines	3	2	1	2	5
MNFN333	Elective3: Manufacturing Production and Operations Management.	3	2	1	2	5
MNFN331	Heat Transfer					
MNFN332	Mechanical Vibrations					
Total		16	11	4	10	25

Eighth Semester (Level Three)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN323	Computer Aided Design (CAD)	3	2	1	2	5
MNFN312	Industrial Operations Research	3	2	2	-	4
MNFN313	Automatic Control	3	2	2	1	5
MNFN325	Modern Manufacturing Methods	3	2	1	2	5
GENN351	Elective 1: General Engineering Economy.	2	2	-	-	2
GENN353	Engineering Laws and Professional ethics.					
GENN352	Environmental Effects of Electromagnetic Waves.					
GENN354	Risk Management					
MNFN361	Project-1	3	2	-	3	5
Total		17	12	6	8	26

Summer Training

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN360	Industrial Training (2)	3	-	-	-	-
Total		3	-	-	-	-

Ninth Semester (Level Four)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN421	Computer Aided Manufacturing (CAM)	3	2	-	3	5
MNFN324	Advanced Materials and Composite	3	2	1	2	5
MNFN461	Project-2a	2	1	-	3	4
MNFN422	Hydraulic Power Systems	3	2	2	1	5
MNFN423	Production Aids Design	3	2	1	2	5
MNFN431	Elective4: Manufacturing Modeling and Simulation.	3	2	1	2	5
MNFN438	Advanced Casting Techniques.					
MNFN435	Advanced Facility Planning					
Total		17	11	5	13	29

Tenth Semester (Level Four)

Code	Course	Credit Hours	Contact Hours			
			L	T	P	Total
MNFN424	Industrial Thermal Systems	3	2	1	2	5
MNFN411	Quality Control and Quality Management	3	2	1	2	5
GENN341	Project Management	2	2	-	-	2
	Elective2: General					
GENN451	Advanced Computer Systems Implementation.	2	2	1	-	3
GENN452	Civilization and heritage	2	2	-	-	2
GENN453	Industrial Psychology.	2	2	-	-	2
GENN454	Marketing	2	2	-	-	2
MNFN462	Project-2b	4	3	-	3	6
	Elective5: Manufacturing					
MNFN430	Advanced Forming Techniques.	3	2	1	2	5
MNFN434	Automation in Production and CIM					
MNFN437	Electro- Hyd. & pneumatic Systems					
	Total	17	13	4	9	26

2.5. Curriculum Mapping

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

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

2.6. Courses Specifications

The detailed program courses specifications are given in **Appendix 2**. These courses specifications were revised and approved on **September 2018**. The contribution of each course to the program ILO's were considered during this revision.

3. Program Admission Requirements

- Admission is fully organized by the admission office of the Ministry of Higher Education.
- Secondary School Certificate Graduates of other countries are eligible to join this program if they met the minimum grades set by Admission Office of the Ministry of Higher Education.
- The study begins with 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 and Learning Methods

Teaching methods

- Lecture
- Presentations and Movies
- Discussions
- Tutorials
- Problem solving
-

Learning methods

- Modeling and simulation
- Cooperative learning
-

6. Student Assessment

- Written exam
- Quizzes and reports
- Oral exams
- Practical

7. 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

Curriculum Mapping

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Curriculum Mapping

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

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

A1.2 Curriculum Mapping Matrices

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

Code	Course Title	Program Intended Learning Outcomes (A)																							
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
GENN041	Contemporary Social Issues									1	1														
GENN042	English Language.									1	1														
GENN043	History of Engineering and Technology.	1				1			1	1		1			1										
GENN141	Presentation Skills.									1	1		1												
GENN142	Technical Report Writing.				1						1	1													
GENN341c	Project Management.		1	1	1	1		1				1								1	1			1	
GENN351a	Elective1 Engineering Economy.	1	1			1		1							1				1						
GENN352	Elective1 Environmental Effects of Electromagnetic Waves.	1	1			1				1		1													
GENN353a	Elective1 Engineering Laws and Professional ethics.					1	1			1	1	1													
GENN354	Elective1 Risk Management	1	1		1	1	1					1													
GENN451a	Elective2 Advanced Computer Systems Implementation.				1		1		1		1		1												
GENN452a	Elective2 Civilization and heritage									1		1						1							
GENN453	Elective2 Industrial Psychology.				1					1		1							1	1					
GENN454	Elective2 Marketing	1							1	1															
CHEN001	Chemistry.	1		1	1	1	1	1	1			1	1												
CMPN010	Program Design and Computer Languages.	1	1		1	1			1					1		1	1		1						
MTHN001	Mathematics-1 (Algebra and Calculus).	1	1			1																			
MTHN002	Mathematics-2 (Integration and Analytic Geometry).	1		1		1																			
MTHN103	Mathematics -3 (Differential Equations and Transforms).	1	1			1																			
MTHN105	Math-5 (Numerical Analysis)	1				1					1														
MTHN207	Mathematics -7 (Introduction to Prob. and Statistics)	1	1			1					1														
MTHN209	Mathematics 9 (Applications of Advanced Calculus)	1		1		1																			
PHYN001	Physics-1.	1	1	1	1									1											
PHYN002	Physics -2.	1		1	1	1								1	1	1									1
ELCN216	Electro Engineering	1	1	1	1	1																			
ELCN217	Electric Machines	1	1	1	1	1									1		1	1							
MECN001	Mechanics -1.	1	1	1	1																				
MECN002	Mechanics-2.	1	1	1	1	1																			
MNFN001	Introduction to Engineering Materials.		1	1	1														1						
MNFN002	Engineering Graphics.		1		1	1			1		1														
MNFN003	Principles of Production Engineering.	1	1		1																				
MNFN060	Summer training for level zero	1	1		1						1								1						
MNFN111	Mechanics of Materials			1	1	1					1			1					1						
MNFN112	Fundamentals of Material Science		1	1	1														1						
MNFN113	Mechanics of Machines-1	1													1										
MNFN114	Machine Drawing-1		1	1	1	1	1												1						
MNFN115	Mechanics of Machines-2	1		1		1							1	1											
MNFN116	Machine Drawing-2		1			1	1												1	1					
MNFN121	Metal Cutting Processes			1					1		1		1	1											
MNFN122	Materials Technology and Testing		1	1	1														1						
MNFN160	Summer training for level one	1	1		1						1				1				1						
MNFN211	Fluid Mechanics	1	1	1	1	1								1	1				1	1					
MNFN212	Computer Applications-1		1	1	1		1				1			1					1						
MNFN213	Computer Applications-2	1				1	1		1					1		1	1		1				1		
MNFN214	Thermodynamics	1	1	1	1	1			1				1	1					1						
MNFN221	Metals Cutting Theory			1					1		1		1	1											
MNFN222	Machine Design-1		1	1	1														1						
MNFN223	Foundry Technology	1			1				1			1		1					1	1					
MNFN224	Machine Design-2		1	1	1														1						
MNFN225	Engineering Metrology			1	1											1									
MNFN260	Industrial Training(1)																		1	1					
MNFN261	Seminar-1.									1		1		1											
MNFN262	Seminar-2.									1		1		1											
MNFN311	Mechanical Measurements			1	1																				
MNFN312	Industrial Operation Research	1	1			1								1		1		1							
MNFN313	Automatic Control	1		1	1	1										1									
MNFN321	Joining Processes	1			1				1					1					1	1					
MNFN322	Computer Numerical Control, CNC Machines	1							1				1	1		1	1					1	1	1	
MNFN323	Computer Aided Design (CAD)	1	1		1				1				1	1	1	1		1	1						

MNFN324	Advanced Materials and Composite			1				1			1	1						
MNFN325	Modern Manufacturing Methods	1	1	1	1							1	1				1	
MNFN331	Elective3 Heat Transfer	1	1	1	1													
MNFN332	Elective3 Mechanical Vibrations	1		1		1					1			1				
MNFN333	Elective3 Production and Operations Management	1				1		1	1			1				1	1	
MNFN360	Industrial Training(2)													1	1			
MNFN361	Project-1										1				1			
MNFN411	Quality Control and Quality Management	1	1				1					1				1		1
MNFN421	Computer Aided Manufacturing (CAM)	1			1	1			1			1					1	1
MNFN422	Hydraulic Power Systems	1	1	1	1	1			1									
MNFN423	Production Aids Design	1			1							1			1			
MNFN424	Industrial Thermal Systems				1	1			1			1	1			1	1	1
MNFN430	Elective5 Advanced Forming Techniques			1	1				1			1	1	1				1
MNFN431	Elective4 Modeling and Simulation	1			1	1		1				1	1		1	1	1	1
MNFN434	Elective5 Automation in Production and CIM					1			1		1	1	1		1			1
MNFN435	Elective4 Advanced Facility Planning		1	1	1							1						
MNFN437	Elective5 Electro- Hyd. and Pneumatic Systems	1		1					1			1	1		1			
MNFN438	Elective4 Advanced casting techniques	1		1	1				1						1	1		1
MNFN461	Project-2a											1				1		
MNFN462	Project-2b											1				1		

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

Code	Course Title	Intellectual skills (B)																					
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
GENN041	Contemporary Social Issues				1					1			1										
GENN042	English Language.				1																		
GENN043	History of Engineering and Technology.	1	1				1	1															
GENN141	Presentation Skills.														1								
GENN142	Technical Report Writing.				1							1	1										
GENN341c	Project Management.			1		1				1	1										1	1	1
GENN351a	Elective1 Engineering Economy.	1	1					1	1					1									
GENN352	Elective1 Environmental Effects of Electromagnetic Waves.	1	1	1	1																		
GENN353a	Elective1 Engineering Laws and Professional ethics.			1	1					1			1										
GENN354	Elective1 Risk Management	1	1	1	1			1		1													
GENN451a	Elective2 Advanced Computer Systems Implementation.								1	1		1		1	1	1			1				
GENN452a	Elective2 Civilization and heritage																		1	1		1	
GENN453	Elective2 Industrial Psychology.			1		1				1													
GENN454	Elective2 Marketing	1	1																				
CHEN001	Chemistry.	1	1	1	1		1		1		1		1										
CMPN010	Program Design and Computer Languages.	1	1	1	1			1					1	1				1	1				
MTHN001	Mathematics-1 (Algebra and Calculus).	1	1	1				1															
MTHN002	Mathematics-2 (Integration and Analytic Geometry).	1	1	1	1			1				1											
MTHN103	Mathematics -3 (Differential Equations and Transforms).	1	1	1				1															
MTHN105	Math-5 (Numerical Analysis)	1	1	1				1				1											
MTHN207	Mathematics -7 (Introduction to Prob. and Statistics)	1	1	1	1			1				1											
MTHN209	Mathematics 9 (Applications of Advanced Calculus)	1	1	1	1																		
PHYN001	Physics-1.	1	1	1				1						1				1				1	
PHYN002	Physics -2.		1	1	1	1	1							1		1							
ELCN216	Electro Engineering	1	1			1				1				1	1	1							
ELCN217	Electric Machines		1	1			1			1		1											
MECN001	Mechanics -1.	1	1																				
MECN002	Mechanics-2.	1	1			1								1		1							
MNFN001	Introduction to Engineering Materials.	1	1		1									1		1		1					
MNFN002	Engineering Graphics.			1		1		1	1	1													
MNFN003	Principles of Production Engineering.		1	1							1								1				
MNFN060	Summer training for level zero		1	1					1		1							1					
MNFN111	Mechanics of Materials					1	1	1							1	1			1				
MNFN112	Fundamentals of Material Science	1	1			1								1		1		1					
MNFN113	Mechanics of Machines-1	1												1									
MNFN114	Machine Drawing-1			1	1					1					1								
MNFN115	Mechanics of Machines-2	1	1			1								1	1	1		1					
MNFN116	Machine Drawing-2			1	1					1									1				
MNFN121	Metal Cutting Processes			1					1				1					1					
MNFN122	Materials Technology and Testing	1	1			1								1		1		1		1			
MNFN160	Summer training for level one		1	1						1		1							1				
MNFN211	Fluid Mechanics	1	1					1						1				1					
MNFN212	Computer Applications-1			1	1					1									1				
MNFN213	Computer Applications-2							1						1					1				1
MNFN214	Thermodynamics	1	1	1		1								1					1				
MNFN221	Metals Cutting Theory			1						1			1					1					
MNFN222	MachineDesign-1		1			1	1							1									
MNFN223	Foundry Technology	1	1	1		1	1							1		1							
MNFN224	Machine Design-2		1			1	1							1									
MNFN225	Engineering Metrology				1	1				1			1			1		1				1	
MNFN260	Industrial Training(1)				1								1										
MNFN261	Seminar-1.		1					1		1	1												
MNFN262	Seminar-2.		1					1		1	1												
MNFN311	Mechanical Measurements				1	1				1			1			1		1				1	
MNFN312	Industrial Operation Research	1	1	1				1	1			1		1					1				
MNFN313	Automatic Control	1				1								1		1							
MNFN321	Joining Processes	1	1	1		1	1							1		1							
MNFN322	Computer Numerical Control, CNC Machines	1	1	1																1			
MNFN323	Computer Aided Design (CAD)	1	1			1				1			1		1		1						
MNFN324	Advanced Materials and Composite		1	1				1					1						1	1			
MNFN325	Modern Manufacturing Methods		1							1	1					1				1			
MNFN331	Elective3 Heat Transfer	1	1			1								1			1						
MNFN332	Elective3 Mechanical Vibrations	1	1											1	1								
MNFN333	Elective3 Production and Operations Management							1	1								1			1			

MNFN360	Industrial Training(2)			1						1											
MNFN361	Project-1	1		1							1						1				
MNFN411	Quality Control and Quality Management				1	1			1		1	1	1				1				
MNFN421	Computer Aided Manufacturing (CAM)	1	1	1		1			1				1				1				
MNFN422	Hydraulic Power Systems	1	1			1			1				1	1	1						
MNFN423	Production Aids Design	1	1	1													1				
MNFN424	Industrial Thermal Systems	1	1	1			1						1				1				
MNFN430	Elective5 Advanced Forming Techniques	1			1				1					1	1			1			
MNFN431	Elective4 Modeling and Simulation	1	1		1	1			1		1		1	1							
MNFN434	Elective5 Automation in Production and CIM	1	1										1	1		1		1			1
MNFN435	Elective4 Advanced Facility Planning	1		1		1															
MNFN437	Elective5 Electro- Hyd. and Pneumatic Systems	1				1			1				1	1			1				
MNFN438	Elective4 Advanced casting techniques	1		1	1	1	1					1		1			1				1
MNFN461	Project-2a	1		1								1					1				
MNFN462	Project-2b	1		1								1					1				

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

Code	Course Title	Professional and practical skills C's																					
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
GENN041	Contemporary Social Issues	1				1																	
GENN042	English Language.					1						1	1										
GENN043	History of Engineering and Technology.																						
GENN141	Presentation Skills.											1											
GENN142	Technical Report Writing.				1																		
GENN341c	Project Management.			1		1				1	1										1	1	1
GENN351a	Elective1 Engineering Economy.	1	1					1	1					1									
GENN352	Elective1 Environmental Effects of Electromagnetic Waves.																						
GENN353a	Elective1 Engineering Laws and Professional ethics.	1				1																	
GENN354	Elective1 Risk Management	1	1				1					1											
GENN451a	Elective2 Advanced Computer Systems Implementation.					1	1				1			1	1	1							
GENN452a	Elective2 Civilization and heritage																			1		1	1
GENN453	Elective2 Industrial Psychology.		1		1				1														
GENN454	Elective2 Marketing																						
CHEN001	Chemistry.	1	1	1		1			1				1										
CMPN010	Program Design and Computer Languages.	1	1	1	1	1	1							1	1	1							
MTHN001	Mathematics-1 (Algebra and Calculus).	1											1										
MTHN002	Mathematics-2 (Integration and Analytic Geometry).	1											1										
MTHN103	Mathematics -3 (Differential Equations and Transforms).	1											1										
MTHN105	Math-5 (Numerical Analysis)	1	1					1						1									
MTHN207	Mathematics -7 (Introduction to Prob. and Statistics)	1	1					1						1									
MTHN209	Mathematics 9 (Applications of Advanced Calculus)	1											1										
PHYN001	Physics-1.	1					1						1				1	1					
PHYN002	Physics -2.	1				1			1			1			1								
ELCN216	Electro Engineering	1		1		1			1			1	1				1						
ELCN217	Electric Machines	1			1	1			1														
MECN001	Mechanics -1.	1	1																				
MECN002	Mechanics-2.	1		1		1																	
MNFN001	Introduction to Engineering Materials.	1	1																	1			
MNFN002	Engineering Graphics.		1	1	1							1		1									
MNFN003	Principles of Production Engineering.	1		1				1															
MNFN060	Summer training for level zero	1		1	1									1				1					
MNFN111	Mechanics of Materials	1		1		1			1				1										
MNFN112	Fundamentals of Material Science	1	1																	1			
MNFN113	Mechanics of Machines-1	1																					
MNFN114	Machine Drawing-1	1	1	1							1			1	1								
MNFN115	Mechanics of Machines-2	1		1		1	1		1			1			1				1				
MNFN116	Machine Drawing-2	1	1								1			1	1								
MNFN121	Metal Cutting Processes					1	1		1				1										
MNFN122	Materials Technology and Testing	1	1																	1			
MNFN160	Summer training for level one	1		1	1									1				1					
MNFN211	Fluid Mechanics		1	1		1							1				1	1					
MNFN212	Computer Applications-1	1	1	1							1				1								1
MNFN213	Computer Applications-2	1	1			1			1		1				1	1						1	1
MNFN214	Thermodynamics	1	1			1						1	1				1	1	1				
MNFN221	Metals Cutting Theory					1	1		1				1										
MNFN222	Machine Design-1	1		1									1	1									
MNFN223	Foundry Technology	1		1		1	1						1	1			1	1					
MNFN224	Machine Design-2	1		1									1	1									
MNFN225	Engineering Metrology		1	1		1											1						
MNFN260	Industrial Training(1)	1														1			1	1			
MNFN261	Seminar-1.	1	1							1													
MNFN262	Seminar-2.	1	1							1													
MNFN311	Mechanical Measurements		1	1		1											1						
MNFN312	Industrial Operation Research	1	1					1	1				1						1				
MNFN313	Automatic Control	1				1											1	1					
MNFN321	Joining Processes	1		1		1	1						1	1			1	1					
MNFN322	Computer Numerical Control, CNC Machines					1									1	1		1	1				
MNFN323	Computer Aided Design (CAD)	1	1																				
MNFN324	Advanced Materials and Composite			1		1			1							1		1		1			
MNFN325	Modern Manufacturing Methods														1	1	1	1	1			1	
MNFN331	Elective3 Heat Transfer	1				1	1	1									1						

MNFN332	Elective3 Mechanical Vibrations	1	1	1		1											1				
MNFN333	Elective3 Production and Operations Management	1	1															1			
MNFN360	Industrial Training(2)	1													1			1	1		
MNFN361	Project-1	1	1			1			1				1	1			1		1		
MNFN411	Quality Control and Quality Management									1							1				
MNFN421	Computer Aided Manufacturing (CAM)	1	1			1	1			1	1				1		1				
MNFN422	Hydraulic Power Systems	1		1		1	1						1				1	1			
MNFN423	Production Aids Design	1		1																	
MNFN424	Industrial Thermal Systems	1	1	1													1				
MNFN430	Elective5 Advanced Forming Techniques		1	1		1											1	1		1	
MNFN431	Elective4 Modeling and Simulation	1				1	1	1									1				
MNFN434	Elective5 Automation in Production and CIM					1	1	1						1							1
MNFN435	Elective4 Advanced Facility Planning	1	1	1		1	1												1		
MNFN437	Elective5 Electro- Hyd. and Pneumatic Systems	1	1	1		1	1						1	1			1				
MNFN438	Elective4 Advanced casting techniques	1		1		1	1						1	1			1	1			1
MNFN461	Project-2a	1	1			1				1			1	1			1		1		
MNFN462	Project-2b	1	1			1				1			1	1			1		1		

Table A1-5 Curriculum Mapping Matrix Courses/General Transferrable skills (D's)

Code	Course Title	General and transferable skills (D)								
		01	02	03	04	05	06	07	08	09
GENN041	Contemporary Social Issues	1		1				1		1
GENN042	English Language.	1	1	1						
GENN043	History of Engineering and Technology.	1						1	1	
GENN141	Presentation Skills.	1	1	1		1		1		
GENN142	Technical Report Writing.						1		1	
GENN341c	Project Management.	1		1			1			1
GENN351a	Elective1 Engineering Economy.	1	1	1				1		1
GENN352	Elective1 Environmental Effects of Electromagnetic Waves.	1		1	1		1	1		
GENN353a	Elective1 Engineering Laws and Professional ethics.	1		1				1		1
GENN354	Elective1 Risk Management	1	1	1		1	1	1		1
GENN451a	Elective2 Advanced Computer Systems Implementation.	1		1	1			1		1
GENN452a	Elective2 Civilization and heritage			1			1			1
GENN453	Elective2 Industrial Psychology.	1	1				1			1
GENN454	Elective2 Marketing	1						1	1	
CHEN001	Chemistry.	1	1	1	1	1		1		
CMPN010	Program Design and Computer Languages.	1	1	1	1	1		1		1
MTHN001	Mathematics-1(Algebra and Calculus).			1				1		
MTHN002	Mathematics-2(Integration and Analytic Geometry).	1		1				1		
MTHN103	Mathematics -3(Differential Equations and Transforms).			1				1		
MTHN105	Math-5 (Numerical Analysis)			1	1			1		
MTHN207	Mathematics -7 (Introduction to Prob. and Statistics)			1				1		
MTHN209	Mathematics 9 (Applications of Advanced Calculus)			1				1		
PHYN001	Physics-1.	1	1	1	1	1	1	1	1	1
PHYN002	Physics -2.	1		1	1	1		1		
ELCN216	Electro Engineering	1		1				1		1
ELCN217	Electric Machines		1	1			1	1		
MECN001	Mechanics -1.	1	1							
MECN002	Mechanics-2.	1	1							
MNFN001	Introduction to Engineering Materials.	1		1				1		1
MNFN002	Engineering Graphics.	1		1						1
MNFN003	Principles of Production Engineering.	1		1				1		1
MNFN060	Summer training for level zero	1		1				1		1
MNFN111	Mechanics of Materials	1		1						1
MNFN112	Fundamentals of Material Science	1		1				1		1
MNFN113	Mechanics of Machines-1	1		1						1
MNFN114	Machine Drawing-1	1		1						1
MNFN115	Mechanics of Machines-2		1	1			1	1	1	1
MNFN116	Machine Drawing-2	1				1				1
MNFN121	Metal Cutting Processes	1		1	1	1				
MNFN122	Materials Technology and Testing	1		1				1		1
MNFN160	Summer training for level one	1		1				1		11
MNFN211	Fluid Mechanics	1	1	1		1				
MNFN212	Computer Applications-1	1		1						1
MNFN213	Computer Applications-2	1			1					
MNFN214	Thermodynamics	1		1				1	1	
MNFN221	Metals Cutting Theory	1		1	1	1				
MNFN222	MachineDesign-1		1	1				1		1
MNFN223	Foundry Technology	1		1				1		1
MNFN224	Machine Design-2			1				1		1
MNFN225	Engineering Metrology		1							
MNFN260	Industrial Training(1)			1			1	1		
MNFN261	Seminar-1.			1			1	1		
MNFN262	Seminar-2.			1			1	1		
MNFN311	Mechanical Measurements		1							
MNFN312	Industrial Operation Research	1		1			1	1		1
MNFN313	Automatic Control			1	1			1		
MNFN321	Joining Processes	1		1				1		1
MNFN322	Computer Numerical Control, CNC Machines	1		1			1			
MNFN323	Computer Aided Design (CAD)				1	1				
MNFN324	Advanced Materials and Composite			1	1			1	1	1
MNFN325	Modern Manufacturing Methods	1		1	1			1		1
MNFN331	Elective3 Heat Transfer	1		1				1		1
MNFN332	Elective3 Mechanical Vibrations		1	1			1	1	1	1
MNFN333	Elective3 Production and Operations Management	1	1	1				1		1
MNFN360	Industrial Training(2)			1			1	1		
MNFN361	Project-1			1			1	1		
MNFN411	Quality Control and Quality Management	1		1				1		
MNFN421	Computer Aided Manufacturing (CAM)	1			1					
MNFN422	Hydraulic Power Systems	1		1	1			1		1
MNFN423	Production Aids Design	1		1				1		1
MNFN424	Industrial Thermal Systems		1	1			1	1	1	1
MNFN430	Elective5 Advanced Forming Techniques	1		1				1		
MNFN431	Elective4 Modeling and Simulation	1		1	1		1			
MNFN434	Elective5 Automation in Production and CIM	1		1	1			1		1

MNFN435	Elective4 Advanced Facility Planning		1	1	1				1
MNFN437	Elective5 Electro- Hyd. and Pneumatic Systems	1		1	1			1	1
MNFN438	Elective4 Advanced casting techniques	1		1				1	1
MNFN461	Project-2a			1			1	1	
MNFN462	Project-2b			1			1	1	

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

Appendix 2

Courses Specifications

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Table A2-1 Manufacturing Engineering and Production Technology BSc Program Courses

SN	Level	Semester	Course Code	Course Title	Credit hours	Contact Hours				Marks				Final Exam Duration, hr	Pre Requisites
						Lectures	Tutorials	Practical	Total	Mi-Term	Semester	Practical Exam	Final Exam		
HU	0	1	GENN041	Contemporary Social Issues	2	2	-	-	2	20	40	0	40	2	None
HU	0	2	GENN042	English Language.	2	2	-	-	2	20	40	0	40	2	None
HU	0	1	GENN043	History of Engineering and Technology.	2	2	-	-	2	20	40	0	40	2	None
HU	1	1	GENN141	Presentation Skills.	2	2	-	-	2	20	40	0	40	2	None
HU	1	2	GENN142	Technical Report Writing.	2	2	-	-	2	20	40	0	40	2	None
HU	4	2	GENN341c	Project Management.	2	2	-	-	2	20	40	0	40	2	None
HU	3	2	GENN351a	Elective1 Engineering Economy.	2	2	-	-	2	20	40	0	40	2	None
HU	3	2	GENN352	Elective1 Environmental Effects of Electromagnetic Waves.	2	2	-	-	2	20	40	0	40	2	None
HU	3	2	GENN353a	Elective1 Engineering Laws and Professional ethics.	2	2	-	-	2	20	40	0	40	2	None
HU	3	2	GENN354	Elective1 Risk Management	2	2	-	-	2	20	40	0	40	2	None
HU	4	2	GENN451a	Elective2 Advanced Computer Systems Implementation.	2	2	1	-	3	20	40	0	40	2	CMPN010
HU	4	2	GENN452a	Elective2 Civilization and heritage	2	2	-	-	2	20	40	0	40	2	None
HU	4	2	GENN453	Elective2 Industrial Psychology.	2	2	-	-	2	20	40	0	40	2	None
HU	4	2	GENN454	Elective2 Marketing	2	2	-	-	2	20	40	0	40	2	None
BS	0	1	CHEN001	Chemistry.	3	2	1	2	5	20	20	20	40	2	None
BS	0	2	CMPN010	Program Design and Computer Languages.	4	2	3	2	7	20	20	20	40	2	None
BS	0	1	MTHN001	Mathematics-1(Algebra and Calculus).	3	2	3	-	5	20	40	0	40	2	None
BS	0	2	MTHN002	Mathematics-2(Integration and Analytic Geometry).	3	2	3	-	5	20	40	0	40	2	MTHN001
BS	1	1	MTHN103	Mathematics -3(Differential Equations and Transforms).	3	2	3	-	5	20	40	0	40	2	MTHN002
BS	1	2	MTHN105	Math-5 (Numerical Analysis)	3	2	2	-	4	20	40	0	40	2	MTHN103
BS	2	1	MTHN207	Mathematics -7 (Introduction to Prob. and Statistics)	3	2	2	-	4	20	40	0	40	2	MTHN002
BS	2	2	MTHN209	Mathematics 9 (Applications of Advanced Calculus)	3	2	2	-	4	20	40	0	40	2	MTHN103
BS	0	1	PHYN001	Physics-1.	3	2	1	2	5	20	20	20	40	2	None
BS	0	2	PHYN002	Physics -2.	3	2	1	2	5	20	20	20	40	2	PHYN001
EL	2	1	ELCN216	Electro Engineering	3	2	1	2	5	20	20	20	40	2	PHYN002
EL	2	2	ELCN217	Electric Machines	3	2	1	2	5	20	20	20	40	2	ELCN216
ME	0	1	MECN001	Mechanics -1.	2	1	3	-	4	20	40	0	40	2	None
ME	0	2	MECN002	Mechanics-2.	2	1	3	-	4	20	40	0	40	2	MECN001
ME	0	2	MNFN001	Introduction to Engineering Materials.	1	1	-	-	1	20	40	0	40	2	None
ME	0	1	MNFN002	Engineering Graphics.	3	1	6	-	7	20	40	0	40	3	None
ME	0	2	MNFN003	Principles of Production Engineering.	3	2	-	3	5	20	20	20	40	2	None
ME	0	3	MNFN060	Summer training for level zero	0	0	0	0	0				P/F	Oral	Non
ME	1	1	MNFN111	Mechanics of Materials	3	2	3	-	5	20	40	0	40	2	MECN001
ME	1	1	MNFN112	Fundamentals of Material Science	3	2	1	2	5	20	20	20	40	2	MNFN001
ME	1	1	MNFN113	Mechanics of Machines-1	3	2	3	-	5	20	40	0	40	2	MECN002
ME	1	1	MNFN114	Machine Drawing-1	3	2	4	-	6	20	40	0	40	3	MNFN002 MNFN060
ME	1	2	MNFN115	Mechanics of Machines-2	3	2	3	-	5	20	40	0	40	2	MNFN113
ME	1	2	MNFN116	Machine Drawing-2	3	2	4	-	6	20	40	0	40	3	MNFN114
ME	1	2	MNFN121	Metal Cutting Processes	3	2	1	2	5	20	20	20	40	2	MNFN003
ME	1	2	MNFN122	Materials Technology and Testing	3	2	1	2	5	20	40	0	40	2	MNFN111 MNFN112
ME	1	3	MNFN160	Summer training for level one	0	0	0	0	0				P/F	Oral	MNFN060
ME	2	1	MNFN211	Fluid Mechanics	3	2	1	2	5	20	20	20	40	2	MTHN002
ME	2	1	MNFN212	Computer Applications-1	3	1	4	-	5	20	40	0	40	2	CMPN010, MNFN160

SN	Level	Semester	Course Code	Course Title	Credit hours	Contact Hours				Marks				Final Exam Duration, hr	Pre Requisites
						Lectures	Tutorials	Practical	Total	Mi- Term	Semester	Practical Exam	Final Exam		
ME	2	2	MNFN213	Computer Applications-2	3	2	3	-	5	20	40	0	40	2	MNFN212
ME	2	2	MNFN214	Thermodynamics	3	2	1	2	5	20	20	20	40	2	PHYN002
ME	2	1	MNFN221	Metals Cutting Theory	3	2	1	2	5	20	20	20	40	2	MNFN121
ME	2	1	MNFN222	MachineDesign-1	3	2	3	-	5	20	40	0	40	2	MNFN116
ME	2	2	MNFN223	Foundry Technology	3	2	1	2	5	20	20	20	40	2	MNFN112
ME	2	2	MNFN224	Machine Design-2	3	2	3	-	5	20	40	0	40	2	MNFN222
ME	3	1	MNFN225	Engineering Metrology	3	2	1	2	5	20	20	20	40	2	MNFN121
ME	2	3	MNFN260	Industrial Training(1)	3	-	-	-	-	0	60	0	40	Oral	65 Credit
ME	1	2	MNFN261	Seminar-1.	1	1	-	-	1	0	60	0	40	Oral	47 Credit, GENN141 GENN142
ME	3	1	MNFN262	Seminar-2.	1	1	-	-	1	0	60	0	40	Oral	MNFN261
ME	3	1	MNFN311	Mechanical Measurements	3	2	-	2	4	20	20	20	40	2	MNFN111
ME	3	2	MNFN312	Industrial Operation Research	3	2	2	-	4	20	40	0	40	2	None
ME	3	2	MNFN313	Automatic Control	3	2	2	1	5	20	20	20	40	2	MTHN103
ME	3	1	MNFN321	Joining Processes	3	2	1	2	5	20	20	20	40	2	MNFN112
ME	3	1	MNFN322	Computer Numerical Control, CNC Machines	3	2	1	2	5	20	20	20	40	2	MNFN213, MNFN121
ME	3	2	MNFN323	Computer Aided Design (CAD)	3	2	1	2	5	20	20	20	40	2	MNFN224
ME	4	1	MNFN324	Advanced Materials and Composite	3	2	1	2	5	20	20	20	40	2	MNFN122
ME	3	2	MNFN325	Modern Manufacturing Methods	3	2	1	2	5	20	20	20	40	2	MNFN221
ME	3	1	MNFN331	Elective3 Heat Transfer	3	2	1	2	5	20	20	20	40	2	MNFN214
ME	3	1	MNFN332	Elective3 Mechanical Vibrations	3	2	1	2	5	20	20	20	40	2	MNFN115
ME	3	1	MNFN333	Elective3 Production and Operations Management	3	2	1	2	5	20	20	20	40	2	Non
ME	3	3	MNFN360	Industrial Training(2)	3	-	-	-	-	0	60	0	40	Oral	101 Credit+ MNFN260
ME	3	2	MNFN361	Project-1	3	2	-	3	5	0	40	0	60	Oral	MNFN262
ME	4	2	MNFN411	Quality Control and Quality Management	3	2	1	2	5	20	20	20	40	2	MTHN207
ME	4	1	MNFN421	Computer Aided Manufacturing (CAM)	3	2	-	3	5	20	20	20	40	2	MNFN322
ME	4	1	MNFN422	Hydraulic Power Systems	3	2	2	1	5	20	20	20	40	2	MNFN211
ME	4	1	MNFN423	Production Aids Design	3	2	1	2	5	20	20	20	40	2	MNFN221
ME	4	2	MNFN424	Industrial Thermal Systems	3	2	1	2	5	20	20	20	40	2	MNFN214
ME	4	2	MNFN430	Elective5 Advanced Forming Techniques	3	2	1	2	5	20	20	20	40	2	MNFN122
ME	4	1	MNFN431	Elective4 Modeling and Simulation	3	2	1	2	5	20	20	20	40	2	MNFN213
ME	4	2	MNFN434	Elective5 Automation in Production and CIM	3	2	1	2	5	20	20	20	40	2	MNFN421
ME	4	1	MNFN435	Elective4Advanced Facility Planning	3	2	1	2	5	20	20	20	40	2	MNFN312
ME	4	2	MNFN437	Elective5 Electro- Hyd. and Pneumatic Systems	3	2	1	2	5	20	20	20	40	2	MNFN313 MNFN422
ME	4	1	MNFN438	Elective4 Advanced casting techniques	3	2	1	2	5	20	20	20	40	2	MNFN223
ME	4	1	MNFN461	Project-2a	2	1	-	3	4	0	40	0	60	Oral	MNFN361
ME	4	2	MNFN462	Project-2b	4	3	-	3	6	0	60	0	40	Oral	MNFN461

HU...Humaniterian courses

BS...Basic Science courses

EL...Electrical Courses

ME...Mechanical Engineering Courses (Basic and Applied)

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
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic Sciences department
Date of specifications approval:	September 2018

B - BASIC INFORMATION

Title Contemporary Social Issues:	Code: GENN041	Level: Freshman,	Semester: First
Credit Hours: 2	Lectures: 2	Tutorial/Exercise: -	Practical: -
		Pre-requisite: non	

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

- b1- (B4, B9, B12) ان يتعلم الطالب مفهوم الانتماء والعادات والتقاليد وأصول المجتمع
- b2- (B4, B9) ان يدرك الطالب علي اهمية الاسره والتنشئة الاجتماعية
- b3- (B4, B12) ان يتعلم مهارات العمل الجماعي واهمية عمل الفريق والفرق بين العمل الجماعي والفريقي

c - Professional and practical skills:

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

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

d - General and transferable skills:

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

- d1- Work in a team and involve in group discussion and seminars (D1, D3).
- d2- Search for information's in references and in internet (D7).
- d3- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
الانتماء: أهميته - أصول المجتمع - العادات والتقاليد المرعية – المواطنة - العوامل المحفزة لحب الوطن (الحرية - احترام الرأي الآخر - عدم التمييز العنصري - الديمقراطية).	6	-	-
النمو والتكامل الاقتصادي: المكونات الاجتماعية والاقتصادية للمجتمع- أساليب القيادة - أساليب ترشيد الموارد - الابتكار وتجديد الموارد - الحوافز الخاصة بأفراد المجتمع - أساليب تقييم المشروعات).	8	-	--
بناء الأسرة: تكوين الأسرة - التنشئة الاجتماعية - النسق الأسرى والأنساق الأخرى - المؤسسات التقليدية والحديثة الخاصة بالأسرة).	6	-	-
مهارات العمل الجماعي : أهمية عمل الفريق-الفارق بين العمل الجماعي والفريقي – كيفية إعداد القادة	4	-	-
الضغوط والمؤثرات المعوقة-النظريات المفسرة للعمل الفريقي.	4	-	-
Total hours	28	-	-

4 - Teaching and Learning and Assessment methods:

Course ILO's	Teaching Methods								Learning Methods		Assesment Method							
	Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Written Exam	Practical Exam	Quizes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1						1	1	1						
	a2	1			1						1	1		1				
	a3	1									1	1		1				
Intellectual Skills	b1	1									1	1		1				
	b2	1			1						1	1		1				
	b3	1	1	1						1	1							
Proffesional	c1	1	1							1	1							
General Tran. Skills	d1	1		1		1				1								
	d2	1	1	1														
	d3	1	1											1				

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes :

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

6-2 Required books

S. Nasef, Contemporary Social Issues, 2007.

6-3 Recommended books: Non**6-4 Periodicals, Web sites, etc.:****7- Facilities required for teaching and learning:**

- Computer,
- Data show
- Computer programs

Course coordinator:

Dr. Shimaa Nabih Ebrahim Esmail

Head of the Department:

Prof. Dr. Laila Solaiman

Date:

September 2018

Course Specification

GENN042: English Language

A- Affiliation

Relevant program:	Manuf. Engineering and Prod. Tech. BSc Program Electronic Eng.and Comm. Tech. BSc Program Computer Engineering and Inf. Tech. BSc Program Architecture Eng.and Building Tech. BSc Program
Department offering the program:	Manuf.Engineering and Prod. Tech. Department Electronic Engineering and Comm. Tech. Department Computer Engineering and Inf. Tech. Department Architecture Eng. and Building Tech. Department
Department offering the course:	Basic Sciences Department
Date of specifications approval:	September, 2018

B - BASIC INFORMATION

Title: English Language	Code: GENN042	Level: 1 ST . Year, 1 ST Semester
Credit Hours: 2	Lectures: 2	Tutorial: - Practical: -
	Pre-requisite: -	

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1) Identifying the most frequent words, phrases and grammar rules in everyday conversation. (A9), (A10)
- a2) how to communicate effectively, even at the very beginning levels. (A9), (A10)
- a3) how to differentiate between tenses. (A9)

b - Intellectual skills:

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

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

c - Professional and practical skills:

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

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

d - General and transferable skills:

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

- d1- Work in a team and involve in group discussion. (D1), (D2), (D3)
- d2- Communicate effectively and present data and results orally and in written form. (D1), (D2), (D3), (D6)

- d3- communicate effectively in written and oral forms.(D3), (D7)
d4- Search for information's in references and in internet. (D4), (D7)
d5- Practice self-learning. (D4), (D7), (D8)

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Computer Hackers	2		
At the Doctor's: Reviewing tenses, Reading	2		
At the Doctor's : Grammar: perfect tenses& prefixes	2		
Global Warming: Reading, Speaking : English communication skills , Suffixes & adj.&adv.	2		
Computer Addiction: Reading: 53-55, Speaking: discussing the topic, Grammar: adjectives	2		
Earthquake: Reading: 59-61, Grammar: Suffixes	2		
Words and their Stories: Reading, Grammar: wh-questions and negatives	2		
Revision: 7th week Exam	2		
Describing People & Things : Reading, Grammar:adj.& adv	2		
Describing People & Things: Reading Grammar : relative clauses	2		
Qualities and Flaws : Speak : dicussing qualities and flaws of each one (pair work Grammar: Possession Pronouns+ Adjectives	2		
Qualities and Flaws (to be continued) List. & Speak: dicussing the topic	2		
People Idioms Grammar: gerund "& to infinitive & adjectives with prepositions	2		
English proverbs Grammar: problem verbs	2		
Total hours	28		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lecture	Warming up	Discussions	Tutorials	Problem solving				Researches and Reports	Modeling and Simulation			Written Exam	Class work	Quizes	Class participation	Assignments			
Knowledge & Understanding	a1	1	1	1						1				1	1	1	1	1			
	a2	1	1	1						1				1	1	1	1	1			
	a3	1	1	1						1				1	1	1	1	1			
Intellectual Skills	b1	1	1	1						1				1	1	1	1	1			
	b2	1	1	1						1				1	1	1	1	1			
	b3	1	1	1						1				1	1		1	1			
	b4	1	1	1						1				1	1	1	1	1			
Applied Professional Skills	c1	1	1	1						1				1	1	1	1	1			
	c2	1	1	1						1				1	1	1	1	1			
	c3	1	1	1						1				1	1	1	1	1			
	c4	1	1	1						1				1	1	1	1	1			
General Tran. Skills	d1	1	1	1						1				1			1				
	d2		1	1						1							1				
	d3	1	1	1						1							1	1			
	d4	1	1	1						1											
	d5									1							1				

5- Assessment Timing and Grading:

Assesment Method	Timing	Grade (Degrees)
Semister Work: quizzes, assignments and class participation	Bi-Weekly	40
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

The English Language Book by Dr Neveen Samir, 2015

6-2 Required books

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

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.:

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

7- Facilities required for teaching and learning:

Library and Internet

Course coordinator:	Dr. Neveen Samir
Head of the Department:	Prof. Layla Solaiman
Date:	Sept., 2018

Course Specification

GENN043: History of Engineering & Technology

A- Affiliation

Relevant program:	Electronic Eng.and Comm. Tech.BSc Program Computer Eng.and Inf. Tech. BSc Program Manufacturing Eng.and Prod.Tech. BSc Program Architecture Eng. & Building Tech. BSc Program
Department offering the program:	Electronic Eng.and Comm. Tech. Department. Computer Eng.and Inf. Tech. Department Manufacturing Eng.and Prod.Tech. Department Architecture Eng. & Building Tech. Department
Department offering the course:	Basic Science Department
Date of specifications approval:	September, 2018

B - Basic information

Title: History of Science and Technology	Code: GENN043	Level:1	Semester: First,.
Hours Credit/Total 2 hrs	Lecture 2 hrs	Tutorial -	Practical -
Prerequisite Non			

C – Professional information

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 والتكنولوجيا – نقل التكنولوجيا – نشاطات العمل الهندسي و مسؤوليات المهندس- امثلة على تطور اوجه النشاط الهندسي و التكنولوجي و أشهر علماء الهندسة كنماذج يحتذى بها

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- مفهوم العلم و الهندسة والتكنولوجيا و علاقتهم ببعضهم البعض و كيفية ابتكار معدات و منظومات تحقق احتياجات المجتمع طبقا لتلك المفاهيم (A1, A11, A14)
- a2- المعلومات التاريخية عن مهنة الهندسة و التكنولوجيا وكذا العلاقة بين مسمى المعهد او الكلية و بين ما يتم دراسته. (A9, A1)
- a3- مفهوم التعليم الهندسي و مجالات العمل للمهندسين و كيفية القيد و التسجيل بنقابة المهندسين و كذا حقوق و واجبات المهندس (A9, A1)
- a4- تطور اوجه النشاط الهندسي و التكنولوجي و ايضا التعرف على الطرق المختلفة لنقل التكنولوجيا (A8,A5)

b - Intellectual skills:

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

- b1) أن يكتسب الطالب مهارات توظيف النظريات و المعارف و البيانات و الافكار لابتكار معدات و منظومات متطورة (B1, B2)
- b2) أن يستخدم الطالب المنهج العلمي في التفكير وصولا لتصميم و تركيب الفروض (B2)
- b3) أن يستطيع الطالب التفكير في حل مشكلة ما من خلال تفهمه لموضوعات الهندسة العكسية (B7)
- b4) ان يستطيع الطالب اتخاذ القرار السليم و اختيار انسب الحلول من خلال دراسته لنماذج و امثلة من المشاكل الهندسية و عرض الحلول الممكنة لها (B6)

d - General and transferable skills:

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

- d1) الامام الطالب بمعايير الجودة و نظم الامان في استخدام المنظومات الهندسية. (D1)
- d2) تدريب الطالب على التفكير و ايجاد التصميمات اللازمة لخلق كل ما هو جديد. (D7,D8).
- d3) إكساب الطالب الخبرة في ايجاد حلول عملية تخدم برامج خارج تخصصه. (D7)
- d4) اكساب الطالب كيفية وضع المعايير اللازمة لتكوين فريق بحثي متكامل (D1)

Course Contribution in the Program ILO's

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

3 – Contents

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

4 – Teaching, Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

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

6-1 Course notes: -

6-2 Required books:

6-3 Recommended books

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

6-4 Periodicals, Web sites, etc.

مواقع الانترنت الخاصة بنقابه المهندسين المصرية

7- Facilities required for teaching and learning:

- Computer, Data show and projector.

Course coordinator: Dr Marwa Mohamed Fouad

Head of the Department: Professor Dr Laila Soliman

Date: September 2018

Course Specification

GENN141: Presentation Skills

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Tech. BSc Program Electronic Engineering and Communication Tech. BSc Program Computer Engineering and Information Tech. BSc Program Architecture Engineering and Building Tech. BSc Program
Department offering the program:	Manufacturing Engineering and Production Tech. BSc Program Electronic Engineering and Communication Tech. BSc Program Computer Engineering and Information Tech. BSc Program Architecture Engineering and Building Tech. BSc Program
Department offering the course:	Electronic Engineering and Communication Tech. Department.
Academic level:	Sophomore
Date of specifications approval:	October, 2018

B - BASIC INFORMATION

Title: Presentation Skills	Code: GENN141	Level: Sophomore ,Third semester
Credit Hours: 2	Lectures: 2	Tutorial:-
	Pre-requisite: None	

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1-** Topics related to humanitarian interests and moral issues (A9)
- a2-** Technical language and report writing (A10)
- a3-** Contemporary engineering topics (A12)

b - Intellectual skills:

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

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

C-Practical and Professional Skills:

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

- c1-**Prepare and present technical reports. (C11)

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

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

3- Contents:

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

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods			Assessment Method				
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Brain storming	Self-Learning	Researches & Reports	Midterm	Quizzes	Assignments	Written Exam	Practical Exam
Knowledge & Understanding	a1	1	1											1	
	a2	1								1			1		
	a3		1	1											
Intellectual Skills	b1	1	1	1				1	1	1			1	1	
Applied Professional Skills	c1	1							1	1		1	1		
General Trans. Skills	d1		1	1				1		1	1				
	d2		1	1										1	
	d3		1	1				1						1	
	d4		1	1				1						1	
	d5	1	1							1	1		1	1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Presentation	Weekly (every week different no. of students to present)	20
CV	Weekly (every week different no. of students to present)	13
Company's biography	Weekly (every week different no. of students to present)	7
Midterm	7 th week	20
Written Exam	16 th week	40
Total		100

6- List of references:

6-1 Course notes

Presentation and Communication Skills "Theoretical part"

6-2 Required books

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

6-3 Recommended books

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

7- Facilities required for teaching and learning:

Lectures room equipped with and data show facility.

Course coordinator:

Dr. Lubna Fekry

Head of the Department:

Prof. Dr. Samir Kamal

Date:

Dec. 2018

Course Specification

GENN142: Technical Report Writing

A- Affiliation

Relevant program:	Manufacturing Eng. and Prod.Tech. BSc Program Electronic Eng.and Comm.Tech. BSc Program Computer Eng. and Inf. Tech.BSc Program Architecture Eng. and Building Tech. BSc Program
Department offering the program:	Manufacturing Eng.and Prod. Tech. Department Electronic Eng. and Comm. Techn. Department Computer Eng. and Inf. Tech. Department Architecture Eng. and Building Tech. Department
Department offering the course:	Basic Sciences Department
Date of specifications approval:	October, 2018

B - BASIC INFORMATION

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

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

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

c - Professional and practical skills:

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

- c1- Use the technical writing tools. [C2]
- c2- Interact professionally with other writers and their writing. [C4]
- c3- communicate effectively his knowledge and scientific findings with other people. [C12], [C14]

d - General and transferable skills:

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

- d1- Perform report and manual writing. [D6]
- d2- Present findings of scientific research in seminars and workshops. [D8]
- d3- Collaborative effectively with the group work and publishing strategies. [D6], [D8]

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A 4, A10, A11
B	Intellectual skills	B4
C	Professional and practical skills	C2, C4, C12, C13
D	General and transferable skills	D6, D8

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

[illegible]

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars assignments and reports	Bi-weekly	20 points
Quizzes	5 th and 10 th	20 points
Mid-Term Exam	Eighth week	20 points
Written Exam	Sixteenth week	40 points
Total		100 points

6- List of references:

6-1 Course notes:

The Report Writing Book by Dr Neveen Samir , 2015

6-2 Required books

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

www.technical-writing.com

7- Facilities required for teaching and learning:

Internet educational lab, Computer and Data show

Course coordinator: Dr. Neveen Samir

Head of the Department: Dr. Layla Soliman

Date: Sept. 2018

Course Specification

GENN341c : Project Management

A- Affiliation

Relevant program/s: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: December 2018

B - Basic Information

Title: Project Management **Code:** GENN341c **Level:** 4th (Senior 2), Second Semester
Credit Hours: 2 **Pre-requisite:** None
Contact Hours: **Lectures:** 2 **Total:** 2

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand the fundamental of the project management, and the basic principles of the feasibility study and manage a new project by giving them the knowledge and skills to do this. This is achieved throughout studying the management process and their implementation in regard to initiating, planning, execution, monitoring controlling and finally close out the project. It also includes studying the quality control, Stakeholder, Communications, Procurement Management, costs, risk control and time management with reasons of delay, in addition to evaluating the project management systems.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- What is meant, goals, main steps of the feasibility study (A2, A3, A5).
- a2- Definition of a project, project management (A3, A7).
- a3- Roll of the project manager (A7, A19, A20).
- a4- Process of a project, steps of managing a project (A4, A7).
- a5- Knowledge area of the project management (A3, A5, A6, A7, A11, A20, A23).
- a6- Evaluating the project management systems (A2, A3, A6, A7, A11, A20, A23).

b - Intellectual skills:

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

- b1- Carry out the feasibility study of a new project (B3, B5, B9)
- b2- Manage and evaluate a project (B3, B5, B10, B20, B21, B22)

c - Professional and practical skills:

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

- c1- Carry out a feasibility study for a new project (C3)
- c2- Manage a project (C2, C3, C16, C19, C21).
- c3- Solve an operational research problems using different techniques (C11)

d - General and transferable skills:

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

- d1- Communicate with others; work in a team and involvement in group discussion and seminars (D1, D3).
- d2- Present data and results orally and in written form (D3, D9).
- d2- Effectively manage main tasks, time, quality, and cost (D6)

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	(A2, A3, A4, A5, A7, A11, A19, A20, A23)
B Intellectual skills	(B3, B5, B9, B10, B20, B21, B22)
C Professional and Practical Skills	(C2, C3, C11, C16, C19, C21)
D General and transferable skills	(D1, D3, D6, D9)

3- Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Introduction	2	-	
➤ Feasibility study	-	-	
• What is meant and the goals of the feasibility study	2		
• Common components of a Feasibility Study	2		
• main steps of the feasibility study	2		
➤ Project management	-	-	
• Definition of a project , project management	2		
• The roll of the project manager	2		
• Process of a project, steps of managing a project	2		
• Knowledge area of the project management	2		
➤ Assignment problems and evaluating the project management	12	-	
Total hours	28	-	-

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods			Assessment Method						
		Lecture	Presentations & Discussions & Tutorials	Problem solving						Modeling	Self-learning				Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam
Knowledge & Understanding	a1	1		1						1				1	1		1		1
	a2	1		1						1				1	1		1		1
	a3	1		1						1				1	1		1		1
	a4	1		1						1				1	1		1		1
	a5	1		1						1				1	1		1		1
	a6	1		1						1				1	1		1		1
Intellectual Skills	b1	1		1						1				1	1		1		1
	b2	1		1						1				1	1	1	1		1
Applied Professional Skills	c1	1		1						1				1	1	1	1		1
	c2	1		1						1				1	1	1	1		1
	c3	1		1						1				1	1	1	1		1
General Tran. Skills	d1	1		1						1				1					
	d2	1		1						1				1					
	d3	1		1						1				1					
	d4	1		1						1				1					

4- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	(2 quizzes)	4, 10-th Week	8+8 = 16
	Reports (4 reports)	3, 5, 9, and 12-th Week	6+6+6+6 = 24
Mid-Term Exam		7-th Week	20
Written Exam		Fourteenth week	40
Total			100

6- List of references:

6-1 Course notes Printed lecture

6-2 Required books

- Project Management Institute, (2017), "A Guide to the Project Management Body of Knowledge" (PMBOK® Guide) – 6th edition, USA.

6-3 Recommended books:

- James P. Lewis, (2007), "Fundamentals of project Management" , AMACOM 3rd Edition Mc Graw-Hill, NY.

6-4 Periodicals, Web sites, etc.

- Fundamentals of project management / Joseph Heagney.—4th ed. paraphrase James P. Lewis, author of the first three publications, 9/1/2019.
- Jim Lombardi (2018), "Project Management Guide book 2018" Method123. 9/1/2019.
- Iowa State University Extension and Outreach, Feasibility and Business Plans. Department of Economics, agdm@iastate.edu, 9/1/2019.

7- Facilities required for teaching and learning:

- Lecturing room

Course coordinator:	Dr. Metwally Abd Elghaffar
Head of the Department:	Prof. Dr. Nabil Gadallah
Date:	December 2018

Course Specification

GENN351: Engineering Economy

A- Affiliation

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

B - Basic information

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

C - Professional information

1 – Course Learning Objectives

A study of this course will enable the student to:

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

2 2- intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1- The major capabilities and limitations of cash flow analysis for evaluating proposed capital investments (A1, A2).
- a2- Mathematics, economics, and engineering principles necessary for analyzing benefit - cost problems (A1, A5).
- a3- The basics to the mechanics of time-value calculations and comparisons of alternatives based on their equivalent annual worthy, present worth, and rate of return. (A2, A14)
- a4- The role of the effects of both depreciation and taxes as well on economic evaluations (A7, A18)

B - Intellectual skills

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

- b1- Apply knowledge of mathematics, economics, and engineering principles to identify, formulate, analyze, and solve engineering economic problems (B1)
- b2- Use basics to the mechanics of time-value calculations and comparisons of alternatives based on the equivalent annual & present worth and rate of return (B2).
- b3- Develop an understanding of managerial accounting and economic principles (B7, B8).
- b4- Carry out role of accounting and the effects of depreciation and taxes on economic evaluations in extensively treatment (B13).

C - Professional and practical skills

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

- c1- Use appropriate techniques, skills, and tools to identify, formulate, analyze, and solve engineering economic problems (C1).
- c2- Communicate results of the modeling process to management and other non-specialist users of engineering analyses (C7).
- c3- Use of benefit-cost analysis for public projects (C9).
- c4- Use modern computer tools, such as spreadsheets, in financial realities from the business world including both opportunities and restrictions- that influence economic decisions (C5).
- c5- Use graphics effectively for justifying solutions to engineering economics problems (C13).

D - General and transferable skills

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

- d1- Work in stressful environment and within constraints. (D2)
- d2- Search for information in references and internet (D7).

d3- Work in a team and involve in group discussion and seminars (D1, D3).

d4- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A1, A2, A5, A7, A14, A18
Intellectual skills	B1,B2,B7,B8, B13
Professional and practical skills	C1,C5,C7,C9, C13
General and transferable skills	D1, D2, D3, D7, D9

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method									
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory				Modeling	Self-learning	Experimental				Class Works	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understand.	a1	1	1	1													1			1		1
	a2	1			1	1				1							1			1		1
	a3	1	1	1	1	1				1							1	1	1			1
	a4	1	1	1						1							1	1				1
Intellectual Skills	b1	1	1		1	1											1			1		1
	b2	1			1	1											1			1		1
	b3	1	1		1	1																
	b4	1	1		1	1											1			1		1
Applied Prof. kills	c1	1	1		1	1				1							1	1	1			1
	c2	1			1	1				1							1	1	1			1
	c3	1		1	1	1				1							1	1	1			1
	c4	1		1	1	1				1							1	1	1			1
	c5		1		1	1				1									1			
General Tran. Skills	d1	1	1	1							1						1	1	1			1
	d2	1	1	1						1							1	1	1			1
	d3	1	1	1						1							1	1	1			1
	d4	1	1	1						1							1	1	1			1

5- Assessment Timing and Grading:

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

6- List of references:

6.1 Course notes

Lecture notes and handouts.

6.2 Required books

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

6.3 Recommended books

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

6.4 Periodical, Web sites, etc.:

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

7- Facilities required for teaching and learning

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

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

Course Specification

GENN352: Environmental Effects of Electromagnetic Waves

A- Affiliation

Relevant program:	Manufacturing Eng. and Prod.Tech. BSc Program Electronic Eng.and Comm.Tech. BSc Program Computer Eng. and Inf. Tech.BSc Program Architecture Eng. & Building Tech. BSc Program
Department offering the program:	Manufacturing Eng.and Prod. Tech. Department Electronic Eng. and Comm. Techn. Department Computer Eng. and Inf. Tech. Department Architecture Eng. and Building Tech. Department
Department offering the course:	Basic Sciences Department
Date of specifications approval:	October, 2018

B - Basic information

Title: Environmental Effects of EMW.	Code: GENN352	Level: 3	
Credit Hours: 2	Lectures: 2	Tutorial/Exercise:0	Practical: 0
Pre-requisite: None			

C - Professional information

1 – Course Learning Objectives:

The Environmental Studies of electromagnetic Waves major prepares students for understanding and addressing complex environmental issues of EMW from a problem-oriented, interdisciplinary perspective.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1. Main concepts and methods from physical sciences and their application in environmental problem solving. A1, A5
- a2. Basic information about electromagnetic waves. A1
- a3. The concepts and terminology for electromagnetic waves applications and uses. A1, A2
- a4. The EMW environmental problems and ways of addressing them, including interactions across local to global scales. A1, A2
- a5. Critical reflection about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world. A11
- a6. Different types of environmental effects of electromagnetic fields. A9

B - Intellectual skills

Through intellectual skills, students will be able to:

- b1. Analyze the concepts of electromagnetic waves. B1
- b2. Analyze the EMW production and properties. B4
- b3. Develop deep understanding and analysis of EMW environmental effects design. B4
- b4. Critically analyze EMW environmental effect issues in communication as well as provide innovative solutions. B2, B3

C - Professional and practical skills Non

D - General and transferable skills

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

- d1- Work in a team environment. D1
- d2- Communicate effectively during perform oral presentation D3
- d3. Use computing and information technology, and synthesize information. D4
- d4- Manage time effectively and work within a deadline. D6
- d5- Practice self-learning. D7

COURSE CONTRIBUTION IN THE PROGRAM ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A5, A9, A11
B	Professional and practical skills	B1, B2, B3, B4
C	Intellectual skills	None
D	General and transferable skills	D1, D3, D4, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Maxwell's equations	1		
➤ Optical properties of electromagnetic waves	1		
➤ Physical properties of electromagnetic waves	1		
➤ Electromagnetic radiation	1		
➤ Electromagnetic waves spectrum	2		
➤ Antenna and transmission lines	2		
➤ Ground waves, sky waves, and space waves	2		
➤ Radio waves	1		
➤ Fading of electromagnetic waves	1		
➤ Applications of electromagnetic waves	1		
➤ Absorption of electromagnetic waves	1		
➤ Health and environmental effects of electromagnetic waves	2		
➤ Health and environmental effects of non-ionizing radiation	2		
➤ Radio frequency radiation	2		
➤ Microwave oven	1		
➤ Radar and human health	1		
➤ Infrared radiation health effect	2		
➤ Visible light health effect	1		
➤ Ultraviolet radiation health effect	1		
➤ International recommendations for radiation exposure	2		
Total hours	28		

Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lec	Presentations and	Discussions and	Tutorials	Problem solving	Laboratory &			Researches and Reports	Modeling and			Written Exam	Practical Exam	Qu	Term papers	Assignments			
Knowledge	a1	1	1	1						1				1		1	1	1			
	a2	1	1	1						1				1		1	1	1			
	a3	1	1	1						1				1		1	1	1			
	a4	1	1	1						1				1		1	1	1			
	a5	1	1	1						1				1		1	1	1			
	a6	1	1	1						1				1		1	1	1			
Intellectual	b1	1	1	1						1				1		1	1	1			
	b2	1	1	1						1				1		1	1	1			
	b3	1	1	1						1				1		1	1	1			
	b4	1	1	1						1				1		1	1	1			

General	d1	1	1								1							1			
	d2	1	1								1							1			
	d3	1	1								1							1			
	d4	1	1								1			1		1	1	1			
	d5	1	1								1							1			

5-Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	20
Quizzes	5 th and 10 th	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

1. Serway, RAYMOND Physics for scientists and engineers 6th Ed, San Francisco: (2003).
2. Walker, JAMES S. Physics 3rd Ed. Pearson Education (2007).
3. Young, HUGH D. and Freedman, ROGER A. University Physics, 12th Ed. Pearson Education (2008).
4. Walker, Jearl (Halliday/Resnick) Fundamentals of Physics 8th Ed, John Wiley & Sons, Inc (2008).
5. Nonresident training course: antennas and wave propagation. Distribution statement approved for public release. United States Navy.
6. Introduction to RF Propagation, John S. Seybold, by John Wiley & Sons, Inc: 2005.
7. 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. Physical Hazards: Non-Ionizing Radiation-Electromagnetic. Safety Institute of Australia Ltd, Tullamarine, Victoria, Australia. 2012. ISBN 978-0-9808743-1-0.

6-1 Course notes:

Nagat A. Elmahdy, Environmental Effects of Electromagnetic Waves. Modern Academy Press, 2016

6-2 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.

6-3 Recommended books:

Halliday, David, Robert Resnick, Jearl Walker.

6-4 Periodicals, Web sites, etc.

1. <http://www.slideshare.net/bleonacoba/history-of-electromagnetic-waves-discovery>
2. <http://www.infocellar.com/networks/wireless/spectrum.htm>
3. Serway, RAYMOND Physics for scientists and engineers 6th Ed. San Francisco: (2003).
4. 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

7- Facilities required for teaching and learning:

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

Course coordinator:

Head of the Department:

Date:

Dr. Marwa Shoaeb
Prof. Dr. Laila Soliman
September, 2016

Course Specification

GENN353: القوانين الهندسية والأخلاقيات المهنية

A- Affiliation

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

B - Basic information

Title: القوانين الهندسية والأخلاقيات المهنية	Code: GENN353	Level: Sixth.	Semester: (Junior)
Credit Hours 2hrs	Lectures 2 hrs	Tutorial -	Practical -

C - Professional information

1 – Course Learning Objectives:

مع نهاية هذا المقرر يكون الطالب قد تمكن من فهم وتحليل وتطبيق المصطلحات والمفاهيم القانونية و التشريعات الصناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمراني 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 تحكم في عمله ، وحقوقه وواجباته ، وإلى علاقته مع الاستشاريين من العمل المتخصص وأخيراً مسؤوليات المالك والمقاول. وتهدف الدورة أيضاً إلى دراسة التدريب وقوانين النقابات ، مع التأكيد على أهمية تحقيق أخلاقيات المهنة ومبادئها من خلال تقديم مقدمة لها.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

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

C: Professional and practical skills:

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

- c1- (C1, C5) أن يعرض ويحل أحد المشاكل القانونية في احد الشركات

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A5, A6, A9, A10, A11
B Intellectual skills	B3, B4, B9, B12
C Professional and practical skills	C1, C5
D General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
مصطلحات ومفاهيم قانونية	٤		
التشريعات الصناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمراني	٤		
قوانين وتشريعات بيئية لحماية البيئة المصرية	٢		
المناقصات والعطاءات. - قانون تنظيم المناقصات والعطاءات	٤		
العقود الهندسية المحلية - العقود الهندسية الدولية- المطالبات والتحكيم	٤		
القواعد واللوائح التي تتحكم في عمل المهندس ، وحقوقه وواجباته	٦		
دراسة التدريب وقوانين النقابات ، مع التأكيد على أهمية تحقيق أخلاقيات المهنة ومبادئها من خلال تقديم مقدمة لها.	٨		
Total hours	٢٨		

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

د شعبان رجب جودة، قوانين وتشريعات هندسيه، الأكاديمية الحديثه للهندسة و التكنولوجيا، المعادي، ٢٠١٤.

6-2 Required books

6-3 Recommended books

جمال الدين احمد نصار، محمد ماجد خلوصي، قانون وتشريعات و عقود الاتحاد الدولي للمهندسين الاستشاريين، القاهرة، ٢٠٠٨.

6-4 Periodicals, Web sites, etc.

www.alamiria.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator:	Dr. Abeer Hassan
Head of the Department:	Prof. Dr. Lila Soliman
Date:	September 2018

Course Specification

GENN354: Risk Management

A- Affiliation

Relevant program:	Manufacturing Engineering and Prod. Tech. BSc Program Electronic Engineering and Comm. Tech.BSc Program Computer Engineering and Inf. Tech.BSc Program Architecture Eng. and Building Tech. BSc Progra
Department offering the program:	Manufacturing Engineering and Prod. Tech.Department Electronic Engineering and Comm. Tech. Department Computer Engineering and Inf. Tech. Department Architecture Engineering and Building Tech. Department
Department offering the course:	Basic science department
Date of specifications approval:	January 2019

B - BASIC INFORMATION

Title: Risk Management	Code: GENN354	Level: three, First Semester
Credit Hours: 2	Lectures: 2	Tutorial/Exercise: - Practical: -
	Pre-requisite: non	

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

The graduate should acquire knowledge and understanding of:

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

b - Intellectual skills:

The graduate should have the ability to:

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

c - Professional and practical skills:

The graduate should have the ability to:

- c1- Apply risk identification and risk assessment techniques. (C1, C2)
- c2- Create risk strategies and plans in different and changing contexts. (C1, C2, C6)
- c3- Manage hazards more efficiently. (C1, C2)
- c4- Undertake crisis management planning and implementation. (C1, C2, C11)

d - General and transferable skills:

The graduate should have the ability to:

- d1- Enhance the ability to critically reflect on own and others' practice in order to improve own/others' actions. (D1, D3)
- d2- Effectively manage tasks, time, and resources. (D2, D6)
- d3- Search for information and engage in life-long self-learning discipline. (D2, D7,D9)

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

Course Contribution in the Program ILO's

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

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	40
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Risk Management

6-2 Required books

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.:

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

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

7- Facilities required for teaching and learning:

- Lectures room equipped with OHP and data show facility.

Course coordinator:

Dr. Nagat A. Elmahdy

Head of the Department:

Professor Dr Laila Solaiman

Date:

January 2019

Course Specification

GENN451a : Advanced Computer Systems Implementation.

A- Affiliation

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

B - Basic information

Title: Advanced Computer Systems Implementation	Code: GENN451a	Level: Junior, Semester-6
Credit Hours: 2	Lectures: 2	Tutorial/Exercise: -1 Practical: - Total: 3
Pre-requisite: CMPN010		

C - Professional information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

- b1- Assess current configuration management maturity and setting goals for improvement. (B8, B9)
- b2- Gather and manage requirements to align ITIL with organizational needs. (B13, B15, B18)
- b3- Describe the schema of your configuration management database (CMDB). (B9, B15)
- b4- Identify, capture, and organize configuration data. (B11)
- b5- Choose and run a pilot system. (B13, B14)

c - Professional and practical skills:

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

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

d - General and transferable skills:

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

- d1- Work in a team and involve in group discussion (D1, D3).
- d2- Communicate effectively and present data and results orally and in written form (D3).
- d3- Use ICT facilities in presentations (D4).
- d4- Search for information's in references and in internet (D7).
- d5- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

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

3-Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method					
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments			Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments	
Knowledge & Understanding	a1	1	1	1						1				1		1	1		
	a2	1												1		1	1	1	
	a3	1												1		1	1	1	
	a4	1	1	1						1				1		1	1	1	
	a5	1												1		1	1	1	
	a6	1	1	1						1				1		1	1	1	
Intellectual Skills	b1	1												1		1		1	
	b2	1												1		1	1	1	
	b3	1	1	1						1				1			1		
	b4	1	1							1				1		1	1	1	
	b5	1												1		1		1	
Applied Professional	c1	1	1	1						1				1		1	1		
	c2	1			1									1		1	1	1	
	c3	1			1									1		1	1	1	
	c4	1	1	1	1					1				1		1	1	1	
	c5	1			1									1		1	1	1	
General Tran. Skills	d1			1						1							1		
	d2		1	1						1	1						1		
	d3	1	1							1							1	1	
	d4	1	1	1						1									
	d5									1	1						1		

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Non

6-2 Required books

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

6-3 Recommended books: Non

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

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs. Microprocessor Lab

Course Coordinator:

Dr. Assem Badr

Head of the Department:

Ass. Prof.Dr. Wafaa Boghdady

Date:

December 2018

Course Specification

Genn452: Civilization and Heritage

A- AFFILIATION

RELEVANT PROGRAM:	Architecture Eng. and Building Tech. BSc Program. Manufacturing Eng. and Prod. Tech. BSc. Program Electronic Eng. And Comm. Tech. BSc. Program Computer Eng. and Information Tech. BSc. Program
Department offering the program:	Architecture Engineering and Building Technology Department Manufacturing Eng. and Production Technology Department. Electronic Eng. and Communication Technology Department. Computer Eng. and Information Technology Department
Department offering the course:	Architecture Engineering and Building Technology Department
Date of specifications approval:	December, 2018

B - BASIC INFORMATION

Title: : Civilization and Heritage	Code:Genn452	Level :4 th , Spring semester
Credit Hours: 2	Lectures: 2	Tutorial/Exercise:- Practical: -
	Pre-requisite: None.	

C - PROFESSIONAL INFORMATION

1 – COURSE LEARNING OBJECTIVES:

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

2 - INTENDED LEARNING OUTCOMES (ILOS)

A - KNOWLEDGE AND UNDERSTANDING:

- On successful completion of the course, the student should demonstrate knowledge and understanding of:
- a1- Theories, issues, concepts demonstrating the interrelation between Civilization and Culture (A9)
 - a2- The role of the architect and planner in realizing the cultural and heritage dimensions when designing a new project. (A17)
 - a3- The role of the architect and planner in the conservation of Architectural heritage (A11)

B - INTELLECTUAL SKILLS:

- On successful completion of the course, the student should be able to:
- b1- Dealing appropriately with Heritage buildings and Architecture (B18, B21).
 - b2- Adapt innovative approaches in urban and architectural design considering the cultural backgrounds and realities of the local community (B19, B21)

C- Professional and practical skills:

- On successful completion of the course, the student should be able to:
- c1- Identify, analyse, understand the interrelation between Culture and Architecture (C19).
 - c2- Generate and develop selective interventions that cope with the significance of Architectural Heritage (C21, C22).
 - c3- Evaluate and criticize the outcomes of urban and Architectural projects in relation to cultural and heritage considerations (C21, C22).

D - GENERAL AND TRANSFERABLE SKILLS:

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

- d1- Collaborate effectively with the multidisciplinary dimensions of Architectural projects (D3).
 d2- Search for information required to develop successful approaches in design (D6).
 d3- Refer to relevant literature effectively in research projects (D9).

COURSE CONTRIBUTION IN THE PROGRAM ILO's

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

3 – CONTENTS

Topic	Lecture hours	Tutorial hours	Practical hours
1. General definitions, terms, and characteristics of culture and Architecture	2		
2. Definitions, Classification of Heritage, World Heritage sites.	2		
3. The Interrelation between culture and traditional and 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. The role of participation and community involvement in Architectural and Urban Design (Local Case studies)	2		
8. A brief discussion of the Anthropology as a tool of understanding local and indigenous cultures and its application to Architecture	2		
9. Regionalism of architecture and architectural expression	2		
10. Urban Heritage (A review of Values)	2		
11. Urban and Architectural Conservation (A review of interventions)	2		
12. Local and international case studies of urban and Architectural projects corresponding to the cultural dimension of the societies.	2		
13. Site Visit	2		
14. Research project presentation and discussion	2		
Total hours	28		

4 - TEACHING AND LEARNING AND ASSESSMENT METHODS:

Course ILO's		Teaching Methods									Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	projects	sketches			Self-learning	Discovering	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizes	Mid-Term Exam	Assignments	Proiect	Researche
Knowledge & Understanding	a1	1	1	1									1		1			1			1	
	a2	1	1	1									1		1			1			1	
	a3	1	1	1									1		1			1			1	
Intellectual Skills	b1	1	1	1									1		1						1	
	b2	1	1	1									1		1						1	

Applied Professional	c1	1	1	1									1		1					1	
	c2	1	1	1									1		1					1	
	c3	1	1	1									1		1					1	
General Tran. Skills	d1			1								1	1							1	
	d2			1								1	1		1					1	
	d3			1								1	1							1	

5- ASSESSMENT TIMING AND GRADING:

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

6- LIST OF REFERENCES:

6-1 Course notes: None.

6-2 Required books:

6-3 Recommended books:

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

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

- أشرف كامل بطرس (١٩٩٨) "الثقافة والنتاج البنائي - منهج لرصد وتحليل واستقراء الأبعاد الثقافية وتوظيفها في عملية البناء" رسالة دكتوراه غير منشورة، كلية الهندسة، جامعة القاهرة.
- حسن المويلحي (٢٠٠٥) "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", The History Press, USA.
- Oliver, P., (1997), "Encyclopedia of vernacular architecture of the world", Cambridge University Press, New York, USA.

7- FACILITIES REQUIRED FOR TEACHING AND LEARNING:

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

Course coordinator:

Associate Professor Nahed Omran

Head of the Department:

Associate Professor: Ibrahim Gouda.

Date:

December, 2018

Modern Academy for Engineering and Technology in Maadi



COURSE SPECIFICATIONS GENN453: Industrial Psychology

A- Affiliation

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

B- BASIC INFORMATION

Title: Industrial Psychology	Code: GENN453	Year /level :4/ Semester 10
Credit Hours: 2	Lectures: 2	Tutorial: - Practical: -
	Pre-requisite: Non	

C – PROFESSIONAL INFORMATION

1- Course Learning objectives:

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

2 – Intended Learning Outcomes (ILOs)

A-Knowledge and Understanding:

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

- a1- the role of industrial engineer (A4 , A9,A18).
- a2- the structural system of human work (A11) .
- a3-the physical environmental impacts on human beings which can be assessed quantitatively (A11 , A19) .

B-Intellectual Skills

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

- b1- Apply basics of ergonomics to instrument display, machine, control and lay out of work place (B3, B5).
- b2- Consider effect of all environmental changes on equipment (B9).
- b3- Diminishing the effects of physical environmental impacts on human beings (B9).

C- Professional and Practical Skills

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

- c1- Create new product design adapted to the customer (C2, C4).
- c2- Make the best use of human abilities (C8) .
- c3- Use the ergonomic factors in domestic and industrial products (C8) .

D-General and Transferable Skills

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

- d1-Collaborate effectively with multidisciplinary team (D1, D2).
- d2- Effectively manage tasks , time , and ,resources (D6 , D9).

Course Contribution in the program ILO'S

ILO's		Program ILO's
A	Knowledge and understanding	A4, A9,A11,A18, A19
B	Intellectual skills	B3,B5,B9
C	Professional and practical skills	C2,C4,C8
D	General and transferable skills	D1,D2,D6,D9

3-Contents

Topic	Lecture hours	Tutorial hours
Industrial Design – Design concepts	2	
Ergonomics	2	

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

4 - Teaching and Learning and Assessments methods:

4 Teaching and Learning and Assessments Methods:																					
Course ILO's		Teaching Methods									Learning Methods				Assessment Method						
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory				Modeling	Self-learning	Experimental			Class Works	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1		1													1		1		1
	a2	1		1													1		1		1
	a3	1		1													1		1		1
Intellectual Skills	b1	1		1													1		1		1
	b2	1		1													1		1		1
	b3	1		1													1		1		1
Applied Prof. Skills	c1	1		1													1		1		1
	c2	1		1													1		1		1
	c3	1		1													1		1		1
General Tran.	d1	1		1							1							1			
	d2	1		1							1							1			

5- Assessment Timing and Grading:

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

6- List of references:

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

6-2 Required books : Non

6-3 Recommended books: Non

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

7- Facilities required for teaching and learning:

- Non

Course coordinator: Prof. Mamdouh Saber
Head of the Department: Prof. Dr. Nabil Gadalla
Date: December 2018

Course Specification GENN 454: Marketing

A- Affiliation

Relevant program:

Manufacturing Engineering and Production Tech. BSc Program
Electronic Engineering and Communication Tech. BSc Program
Computer Engineering and Information Technology BSc Program
Architecture Engineering and Building Technology BSc Program

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

Department offering the course: Basic science department

Date of specifications approval: 15 / 9 / 2018

B - BASIC INFORMATION

Title : Marketing

Credit Hours: 2 hrs

Code: GENN 454

Lectures: 2

Pre-requisite: non

Level: Four

Tutorial/Exercise: -

Semester: 9th

Practical: -

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 ومناطق المبيعات الأقاليم، تحليل حجم المبيعات، تحليل تكلفة التسويق والربح، تقييم الأداء، كتابة عطاءات المسؤوليات الأخلاقية والقانونية.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- (A9, A1) إدارة المبيعات وتطوير برنامج المبيعات

a2- (A8) تحليل حجم المبيعات، تحليل تكلفة التسويق والربح، تقييم الأداء

a3- (A9) تنمية وتوظيف البائعين، اختيار وتوظيف المتقدمين

b - Intellectual skills:

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

b1- (B1, B2) ان يكتسب الطالب مهارات في مجال اساسيات ادارة المبيعات

b2- (B1, B2) ان يدرك الطالب كيفية اختيار وتوظيف المتقدمين وفضل الطرق لتحفيز فريق المبيعات

b3- (B1, B2) ان يستطيع الطالب تحليل تكلفة التسويق حسب مناطق التوزيع و الربح

d - General and transferable skills:

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

d1- (D7) تدريب الطالب على كيفية البحث عن المعلومات في المراجع وفي الانترنت

d2- (D1) اكساب الطالب كيفية العمل في فريق و اشراكهم في مناقشات جماعية

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

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
مجال المبيعات, إدارة قوة المبيعات الاستراتيجية	5		
عملية البيع الشخصية وتنظيم قوة المبيعات	4		
تنميط وتوظيف البائعين, اختيار وتوظيف المتقدمين			
تطوير برنامج المبيعات, تحفيز قوى المبيعات	4		
تعويض قوة المبيعات والمصروفات والنقل	2		
قيادة قوة المبيعات و التنبؤ بالمبيعات	4		
تطوير الميزانيات و مناطق المبيعات الأقاليم	4		
تحليل حجم المبيعات, تحليل تكلفة التسويق والربح	3		
تقييم الأداء, كتابة عطاءات المسؤوليات الأخلاقية والقانونية	2		
مراجعة عامة	28		
Total hours			

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:**6-1 Course notes:** Non**6-2 Required books**

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

6-3 Recommended books: Non

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

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs

Course coordinator: Dr. Shaymaa Sherif Hassan El Shafey

Head of the Department: Professor Dr. Laila Soliman

Date: 15 / 9 / 2018

Course Specification CHEN001: Chemistry

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic Scienc Department
Date of specifications approval:	September, 2018

B - Basic information

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

1 – Course Learning Objectives:

By the end of this course the students should be able to demonstrate the knowledge and understanding of the basic concepts and theory of chemical Engineering subjects such as: gas laws, gas liquidation, Electro chemistry and its applications, thermo chemistry and its applications, solutions and antifreezes to understand some of chemical industries in different fields Such as polymers, lubricants, Soaps and detergents, petrochemicals, cement Industry, water treatments and Desalination.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Key facts, concepts, principles and techniques of Gas and Liquid states of Matter. (A1,A3)
- a2- Theories relevant to Electrochemistry, solutions and thermo chemistry.(A1,A3,A5,A4,A8,A11,A12)
- a3- Some chemical industries in different fields such as eng. practices and regulatory farm works in chem.. Eng. Industry. (A3,A4,A5,A6, A11,A12)
- a4- Technology Supporting water treatments and Desalination Techniques.(A4,A6,A11)
- a5- Scientific principles of petroleum extraction and refining(A1,A3.A4.A7).
- a6- Basic principles for fuel classification and knowing its optimum characteristics, also identify advantage and disadvantage of them (A1,A5,A6,A11,A12).

b - Intellectual skills:

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

- b1- Apply chem Principles and analytical thinking to problems of Gases, Liquids and electrochemistry and determine its effective solutions. (B1, B2 ,B8,B12)
- b2- Select and develop appropriate Some petrochemical Technologies. (B6)
- b3- Exercise professional judgment with respect to commercial and technical risks. (B1)
- b4- Overlap different scientific subjects to reach a new scientific system with a better quality. (B1, B3. B4,B12,B10)
- b5-Think in creative new scientific ideas which are not exist in present time to be used in the fee ten line the field of development of energy recourses, pollution problem, new industrial products (B3, B12)
- b6- Select appropriate solutions for corrosion problems based on analytical thinking. (B1, B2, B6, B8)
- b7- Consider the applicability, economy and risk management. (B4)
- b8-Maintain a systematic and methodic approach in dealing with new advanced industrial products. (B1)

c - Professional and practical skills:

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

- c1-Apply knowledge of scientific equipment and instrumentation competently to determine known concentration and solve its problem.(C1,C5)

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

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A3,A4,A5,A6, A7, A8,A11,A12
B	Intellectual skills	B1,B2,B3,B4,B6,B8,B10,B12
C	Professional and practical skills	C1,C2,C3,C5,C8,C12
D	General and transferable skills	D1,D2,D3,D4,D5,D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Gas law and gas liquefaction.	4	2	-
Liquid state, Refrigeration & heat pump.	4	1	-
Electrochemistry &Metallic corrosion.	2	1	-
Solution & Antifreezes	2	1	-
Thermo chemistry & solar heat, Rocket.	2	1	-
Pollution	2	1	-
Water treatment and destitution	2	1	10
Polymer and Industry	2	1	-
Fuels and combustion	2	1	-
Chemistry and tech. of petroleum new trends in energy resource	2	1	-
Industrial detergents chemistry such cement , lubricants , soap	2	1	4
Acid - base titration	-	-	8
Revision and sheets	2	2	6
Total hours	28	14	28

4 – Teaching, Learning and Assessement methods:

Course IL O's	Teaching Methods						Learning Methods		Assessement Method				
	Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizes	Term papers	Assignments

Knowledge	a1	1	1	1	1		1	1		1		1	1	
	a2	1			1					1		1	1	1
	a3	1			1				1	1		1	1	1
	a4	1	1	1	1	1	1	1		1		1	1	1
	a5	1				1	1			1	1	1	1	1
	a6	1						1					1	1
Intellectual	b1	1			1					1		1		1
	b2	1			1	1				1		1	1	1
	b3	1	1	1	1		1	1		1	1		1	
	b4	1	1	1	1			1		1	1			
	b5	1											1	1
	b6	1				1				1			1	
	b7	1		1				1		1				1
	b8	1	1			1								
Applied	c1	1	1		1	1	1			1	1	1	1	1
	c2	1			1					1		1	1	1
	c3	1		1		1		1	1				1	1
	c4	1	1		1	1					1		1	1
	c5	1	1				1			1	1			
	c6	1		1			1				1	1		
	c7	1			1	1								1
	c8	1	1	1	1		1							
	c9	1				1								1
	c10	1					1				1			
General	d1			1		1		1					1	
	d2		1	1			1	1	1				1	
	d3	1	1		1	1		1					1	1
	d4	1	1	1				1						

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes

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

6-2 Required books:

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

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

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

7- Facilities required for teaching and learning:

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

Course coordinator: Dr Shimaa Nabih Esmail
Head of the Department: Dr. Laila Soliman
Date: September 2018

Course Specification

CMPN010: Program Design and Computer Languages

A- Affiliation

Relevant program:	Computer Engineering and Information Technology BSc Program Electronic Engineering and Communication Tech. BSc Program Manufacturing Engineering and Production Tech. BSc Program Architectural Engineering and Building Technology BSc Program
Department offering the program:	Architecture Engineering and Building Technology Department. Electronic Engineering and Communications Tech. Department Computer Engineering and Information Technology Department Manufacturing Engineering and Production Tech. Department
Department offering the course:	Computer Engineering and Information Technology Department
Date of specifications approval:	December 2018

B - Basic information

Title: Program Design and Computer Languages	Code: CMPN010	Year/level: Freshman - Fall, Spring and Summer Semesters
Credit Hours: 4	Lectures: 2 Tutorial: 3 Practical: 2	Total: 7 Prerequisite: None

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the concepts of programming, the steps of solving problems using flowcharts or using the C++ programming language. They should be able to develop and enhance programming using the Microsoft Visual C++ software (embedded in the Microsoft Visual Studio software package).

2 - Intended Learning Outcomes (ILOS)

a – Knowledge and understanding:

By the end of this course the student should have the following Knowledge:

- a1- Steps for solving programs by computer programs and flowcharts (A1, A2, A4, A15).
- a2- Program structure in C++ (A4, A15, A18).
- a3- Data types, Data declaration (Variables and Constants) in C++ (A16, A18).
- a4- Different Categories of Operators and their precedence in C++ (A1, A13).
- a5- Control Structures in C++ (Decision and Loop Constructs) (A4, A5).
- a6- Arrays, Pointers, References, and dynamic allocation (A16, A18).
- a7- Functions and types of calling (by value, by reference) in C++ (A4, A16, A18).
- a8- Structures, Unions, Enumeration, User-defined data types and ADT (Abstract Data Types) (A4, A15, A16).
- a9- Object-Oriented Programming (OOP) concepts and terminologies (A5, A8, A16, A18).
- a10- Input and Output Files (File I/O s), I/O stream, strings and recursion (A5, A16, A18).

b – Intellectual Skills:

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

- b1-Investigate on a Visual C++ program in a similar way to other computer programming tools (B1, B13, B14).
- b2-Manipulate different data types (B4, B18, B19).
- b3- Analyse the problem required to be solved and design the appropriate C++ program to solve this problem (B1, B2, B3, B13)
- b4-Manipulate the different control structures; investigate decisions and loops suitable for solving the problem (B2, B7).
- b5- Manipulate different C++ structures (Arrays, Structures, Unions and Classes) for different problems (B3, B7, B18).
- b6-Investigate the new programming interface and develop to the Object- Oriented Programming concepts (B17, B18).
- b7-Manipulate input and output files (for reading from and writing into these files respectively) (B4, B19).

c - Professional and practical skills:

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

- c1- Install and use the Visual C++ 2010 (or 2012) software (C6, C14).
- c2- Develop and Produce a solution to the problem through flowcharts and C++ programs (C1, C4).

c3-Solve different engineering problems related to the artificial intelligent systems, microcontroller systems, operating systems and their basic elements (C1, C5, C6, C15).

c4- Design and implement C++different structures (C2, C3, C4, C13).

c5- Apply the concepts of Object –Oriented Programming for solving different engineering problems (C2, C3, C4, C5).

d - General and transferable skills:

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

d1- Work in a team and involve in group discussion and seminars (D1, D2, D3).

d2- Communicate effectively and present data and results orally and in written form (D3, D4).

d3- Use ICT facilities in presentations, and manage resources efficiently (D4, D5).

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A5, A8, A13, A15, A16, A18
B	Intellectual skills	B1, B2, B3, B4, B7, B13, B14,B17,B18, B19
C	Professional and practical skills	C1, C2,C3,C4,C5, C6, C13, C14,C15
D	General and transferable skills	D1, D2, D3, D4, D5,D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Steps for solving programs by computer programs	2	2	2
➤ Program documentation and flow charts	2	2	2
➤ Program structure in C++	1	2	1
➤ Data types and declaration in C++	2	2	2
➤ Input/output in C++ and I/O stream class	1	2	1
➤ I/O manipulation	1	2	1
➤ Operators and precedence in C++	2	2	2
➤ Decision (Selection) Constructs in C++	2	3	2
➤ Loops (Iterations) in C++	2	3	2
➤ Arrays, Pointers, References, and dynamic allocation	2	3	2
➤ Functions in C++, calling functions (by value, by reference)	2	3	2
➤ Structures, Unions, Enumeration, and user-defined data types	2	3	2
➤ Abstract data types (ADT)	1	2	1
➤ Concepts and Terminologies of Object-Oriented Programming (OOP)	1	2	1
➤ Classes and objects	1	2	1
➤ Constructors, destructors, friend functions	1	2	1
➤ Polymorphism, encapsulation, inheritance	1	2	1
➤ File I/O, I/O stream, strings, recursion	2	3	2
Total hours	28	42	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method						
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments		Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments		
Knowledge & Understanding	a1	1	1	1		1			1				1		1	1	1		
	a2	1	1		1								1		1	1	1		
	a3	1	1		1		1		1				1		1	1	1		
	a4	1	1		1		1		1				1	1	1	1	1		
	a5	1	1		1		1		1	1			1	1	1	1	1		
	a6	1	1	1	1		1		1				1	1	1	1	1		
	a7	1	1	1	1		1		1	1			1	1	1	1	1		
	a8	1	1		1		1		1				1	1	1	1	1		
	a9	1	1	1	1		1		1	1			1	1	1	1	1		
	a10	1	1		1		1		1				1	1	1	1	1		
Intellectual Skills	b1		1	1			1			1				1	1	1	1		
	b2	1	1		1		1						1		1	1	1		
	b3	1	1	1	1	1			1				1		1	1	1		
	b4	1	1		1	1	1		1				1	1	1	1	1		
	b5	1	1	1	1		1		1	1			1	1	1	1	1		
	b6	1	1	1	1		1		1	1			1	1	1	1	1		
	b7	1	1		1		1		1				1		1	1	1		
Applied Professional Skills	c1					1								1					
	c2					1								1					
	c3					1								1					
	c4					1								1					
	c5					1								1					
General and Transfer	d1														1		1		
	d2														1		1		
	d3														1		1		
	d4														1		1		
	d5														1		1		

5- Assessment Timing and Grading:

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

6- List of references**6-1 Course notes:**

Lecture notes and handouts

6-2 Required books:

Walter Savitch, (2006) Problem Solving with C++, Pearson Education Inc.

Deitel & Deitel, (2001) C++ How to program, Prentice Hall.

Al Stevens, (2000) C++ Programming Bible, IDG.

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.:

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

7- Facilities required for teaching and learning:

Computer Lab.

Course coordinator:

Dr. Ehab ElShimy

Head of the Department:

A. Prof. Dr. Wafaa Boghdady

Date:

December 2018

Modern Academy for Engineering and Technology
Basic Science Department



Course Specification

MTHN 001: Mathematics-1(Algebra and Calculus)

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic Sciences Department
Date of specifications approval:	September, 2018

B - BASIC INFORMATION

Title: Mathematics-1	Code: MTHN001	Level: First	Semester: First
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 3	Practical: -
Pre-requisite: None			

C - PROFESSIONAL INFORMATION

1 - Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

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

c - Professional and practical skills:

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

- c1- Apply differential calculus in mechanics and electronics. (C1, C12)
- c2- Use matrices and vectors to solve engineering problems. (C1, C12)

d - General and transferable skills:

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

- d1- Write technical reports. (D3)
- d2- Communicate effectively in written form. (D3)
- d3- Search for information's in references and in internet. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A5
B	Professional and practical skills	B1, B2, B3, B7
C	Intellectual skills	C1, C12
D	General and transferable skills	D3, D7

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Quizzes, assignments, term paper	Weekly	40
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

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

6-2 Required books

E. W. Swokoski, "Calculus", 6-th Edition, PWS Publishing Company, Boston, 1994.

R. E. Larson and B. H. Edwards, "Elementary Linear Algebra", 2-nd Edition, DG Heath and Company, Toronto, 1991.

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

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

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator:

Dr. Sabry Abd El-Aziz

Head of the Department:

Prof. Dr. Lila Soliman

Date:

September, 2018

Modern Academy for Engineering and Technology
Basic Science Department



Course Specification

MTHN 002: Mathematics-2 "Integration and Analytic Geometry"

A- Affiliation

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

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

Department offering the course: Basic Science Department

Date of specifications approval: September, 2018

B - BASIC INFORMATION

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

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

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

- a1. Definition of anti-derivative, indefinite integral, definite integrals. (A1, A5)
- a2. Methods of integration (integration by parts, substitution). (A1, A5)
- a3. Integration rules of trigonometric functions, integration of rational functions, improper integrals. (A1, A5)
- a4. Basic concepts of convergence of infinite sequences and series. (A1, A3)
- a5. Equations of lines, planes and conic sections. (A1, A3)

b. Intellectual skills:

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

- b1. Investigate the geometric interpretation of the integration. (B1, B2, B3)
- b2. Develop techniques for using basic integration formulas to obtain indefinite integrals of complicated functions. (B1, B2, B3, B7)
- b3. Explore some of the geometric applications of the definite integral by using it to compute areas between curves, volumes of solids, arc length and surface area. (B1, B2, B3, B4, B7)
- b4. Develop several tests to determine whether a series is convergent or divergent without explicitly finding its sum. (B1, B2, B3, B4, B7)
- b5. Estimate of the sum of the convergent series and the error using various methods. (B1, B11)
- b6. Derive the equation and main geometric properties of lines, planes and conic sections. (B2, B3, B4)

c - Professional and practical skills:

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

- C1. USE INTEGRATION TO EVALUATE AREA BETWEEN CURVES, VOLUME OF SOLIDS WITH KNOWN CROSS SECTIONS, ARC LENGTH. (C1, C12)

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A5
B	Professional and practical skills	B1, B2, B3, B4, B7, B11
C	Intellectual skills	C1, C12
D	General and transferable skills	D1, D3, D7

3 – Contents

Topic		Lecture hours	Tutorial hours
1	Anti-derivative, indefinite integral	2	2
2	Definite integrals and the fundamental theorem of calculus	2	3
3	Methods of integration (integration by parts, substitution)	4	6
4	Integration of trigonometric functions	2	4
5	Trigonometric Substitutions	2	2
6	Integration of rational functions	2	4
7	Miscellaneous Substitutions, improper integrals	2	4
8	Application of definite integral (area, volume, arc length, surface area)	3	4
9	Sequences, series	4	6
10	Equations of lines, planes and circles	3	4
11	Conic sections (parabola, ellipse, hyperbola)	2	3
Total hours		28	42

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assesment Method	Timing	Grade (Degrees)
Quizes, assignments, term papers	Weekly	40
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

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

6-2 Required books

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

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

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

www.sosmath.com

7- Facilities required for teaching and learning:

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

Course coordinator:

Dr. Sabry Abd El-Aziz

Head of the Department:

Prof. Dr. Laila Soliman

Date:

September, 2018

Course Specification

MTHN103: Mathematics -3(Differential Equations and Transforms)

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Tech. BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department
Department offering the course:	Basic Scienc Department
Date of specifications approval:	September, 2018

B - BASIC INFORMATION

Title: Differential Equations and Transform	Code: MTHN103	Level: 1 st (Sophomore)	Semester: Third
Hours Credit/Total 3hrs	Lectures 2hrs	Tutorial 3hrs	Practical

Pre-requisite: MTHN002

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- classification of O.D.E. (A1)
- a2- solution of the O.D.E using suitable methods.(A1,A5)
- a3- rules of Laplace transform.(A1,A2,A5)
- a4- rules of inverse Laplace transform. (A1,A2,A5)
- a5- fourier series and its applications in applied engineering problems. (A1,A2,A5)
- a6- basic concepts of Legendre function.(A1,A5)
- a7- basic concepts of Bessel function.(A1,A5)

b - Intellectual skills:

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

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

c - Professional and practical skills:

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

- c1- apply O.D.E in electrical and mechanical problems. (C1, C12)
- c2- apply Laplace transform in electrical and mechanical problem. (C1, C12)
- c3- apply Fourier series in electrical and mechanical problem. (C1, C12)

d - General and transferable skills:

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

- d1- communicate effectively. (D3)
- d2- search for information. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A5
B	Professional and practical skills	B1, B2, B3, B7
C	Intellectual skills	C1, C12
D	General and transferable skills	D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Definitions, order, degree.	1	1	—
➤ 1 st order differential equations, 2 nd order and n th order differential equations with constant coefficients.	6	10	—
➤ Non homogeneous D.E., undetermined coefficient method.	6	10	—
➤ Variation of parameters, Euler equations, piratical D.E.	3	4	—
➤ Laplace transform, 1 st and 2 nd shifting theorem.	4	6	—
➤ Laplace transforms of derivative and integrals, inverse Laplace transforms, convolution, applications.	4	6	—
➤ Fourier series, half rang expansion, Legendre and Bessel functions.	4	5	—
Total hours	28	42	—

4 - Teaching and Learning and Assesement methods:

Course ILO's		Teaching Methods				Learning Methods	Assesement Method		
		Lecture	Discussions and seminars	Tutorials	Problem solving	Researches and Reports	Written Exam	Quizes	Assignments
Knowledge	a1	1	1	1	1				1
	a2	1		1	1	1	1	1	1
	a3	1	1	1	1	1	1	1	1
	a4	1	1	1	1	1	1	1	1
	a5	1		1	1		1	1	1
	a6	1	1	1	1		1	1	1
	a7	1	1	1	1		1	1	1
Intellectual	b1	1	1		1		1	1	1
	b2	1		1	1		1	1	1
	b3	1	1	1	1	1	1	1	1
	b4	1			1	1	1	1	1
Applied	c1	1	1			1			
	c2	1	1			1			
	c3	1	1		1	1			
General	d1		1	1		1			1
	d2	1			1	1			1

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

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

6-2 Required books

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

www.mathwords.com.

www.khanacademy.org/math/differential-equations

www.sosmath.com/diffeq/diffeq.html

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator:	Assoc.Prof.Dr. Ashraf Taha EL-Sayed
Head of the Department:	Prof.Dr. Lila Soliman
Date:	September 2018

Course Specification

MTHN105: Mathematics-5 Numerical Analysis

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Basic Science Department
Date of specifications approval:	September, 2018

B - BASIC INFORMATION

Title: Mathematics-5 (Numerical Analysis)	Code: MTHN105	Level: Sophomore,	Semester: Fourth
Credit Hours: 3	Lectures: 2	Tutorial: 2	Practical: 0
Pre-requisite: MTHN103			

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

The main objective of this course is to investigate and learn many numerical methods for solving many engineering mathematical problems. It aims to introduce the student to numerical techniques for solving mathematical engineering problems and explains when and why numerical methods work. It also covers solution methods for systems of linear and nonlinear equations

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- techniques of Least square method in curve fitting (A1,A5, A10)
- a2- methods of numerical interpolation using divided differences, Hermite and Lagrange interpolation techniques (A1,A5, A10)
- a3- techniques of numerical Integration (A1, A10)
- a4- types and methods of numerical solution of initial value problems (A1, A10)
- a5- methods of numerical solution of linear and non-linear equation (A1, A10)

b - Intellectual skills:

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

- b1- analyze when and why a numerical method work. (B1, B2, B3, B11)
- b2- choose the best method for solving different mathematical problems (B1, B2, B3, B11)
- b3- apply different techniques of curve fitting and numerical interpolation (B2, B3, B11)
- b4- solve integration, initial value problems, linear and non-linear algebraic equation using numerical methods. (B1, B2, B3, B7, B11)

c - Professional and practical skills:

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

- c1. apply numerical methods to engineering problems (C1, C2, C7, C13)

d - General and transferable skills:

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

- d1- Write technical reports (D3, D7)
- d2- Communicate effectively and present data in written form (D3)
- d3- Communicate using E-mail (D4)
- d4- Search for information from internet (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5, A10
B	Intellectual skills	B1, B2, B3, ,B7, B11
C	Professional and practical skills	C1, C2, C7, C13
D	General and transferable skills	D3, D4, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Curve fitting and linear Approximation of a function.	4	4	
Polynomial interpolation and error estimation in the interpolation formula Lagrange interpolation.	2	2	
Newton interpolation.	2	2	
Hermite interpolation.	2	2	
Newton-Cotes formula, composite Newton-cotes formula	2	2	
Romberg – steifel integration method.	2	2	
Numerical solution of initial value problems	2	2	
Numerical solution of first order methods Runge- Kutta methods	4	4	
Multistep methods.	2	2	
Numerical solution of linear and non-linear equation, Gauss-Seidel method.	4	4	
Numerical solution of nonlinear equations the fixed point iteration method, Newton-Raphson method.	2	2	
Total hours	28	28	

4 - Teaching and Learning and Assesment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semister Work: assignments, participation, home exams,	Bi-Weekly	20
Two quizzes	5 th and 10 th weeks	20
Mid-Term Exam	8-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

Osama El-Gayar, Numerical Methods for Engineers, Lecture Notes, Modern Academy, 2014.

6-2 Required books

Steven C. Chapra and Raymond P. Canale, Numerical Methods for Engineers, 7th ed., McGraw-Hill Education, New York, 2015.

6-3 Recommended books:

E. Kreyszig, Advanced Engineering Mathematics, 8ed, John Willey & Sons, Inc., 2014

R. L.Brude, Numerical Analysis,4th ed., McGraw Hill, 1995.

6-4 Periodicals, Web sites, etc.

<http://math.fullerton.edu/mathews/numerical.html>

<http://archives.math.utk.edu/topics/numericalAnalysis.html>

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator:

Associate Prof. Sameh Shenawy

Head of the Department:

Prof. Lila Soliman

Date:

Sebtemper 2018

Course Specification

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

A- Affiliation

Relevant program:	Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Manufacturing Engineering and Production Technology Department
Department Date offering the course:	Basic Sciences Department
Date of specifications approval:	September, 2018

B - BASIC INFORMATION

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

C - PROFESSIONAL INFORMATION

1 - Course Learning Objectives:

The main objective of this course is to enable the student to gain, investigate and learn the main concepts of functions, set theory, random events, probability functions, mathematical expectation, conditional probability, Binomial distribution, normal distribution, Sampling and the central limit theorem, Estimation, hypothesis testing, regression and correlation and Chi-square analysis and analysis of variance.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

- b1- describe discrete data graphically and compute measures of centrality and dispersion. (B1, B2)
- b2- compute probabilities by applying different probability rules and theorems of probability. (B1, B2, B4, B7)
- b3- construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance. (B1, B2, B7)
- b4- apply basic concepts of probability functions, Mathematical expectation, variables, discrete distribution, binomial distribution, continuous distribution, and normal distribution to applications. (B1, B2)
- b5- evaluate and analyze basic concepts of statistics, sampling, the central limit theorem, estimation, correlation and regression. (B1, B2, B3, B11)

c - Professional and practical skills:

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

- c1- apply probability and statistics methods to engineering problems (C1, C2, C7, C13)

d - General and transferable skills:

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

- d1- Write technical reports. (D3)
- d2- Communicate effectively in written form. (D3).
- d3- Search for information's in references and in internet (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A5, A10
B	Intellectual skills	B1, B2, B3, B4, B7, B11
C	Professional and practical skills	C1, C2, C7, C13
D	General and transferable skills	D3, D7

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: assignments, participation and home exams	Bi-Weekly	20
Two quizzes.	5 th and 10 th weeks	20
Mid-Term Exam	8-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes:

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

6-2 Required books

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

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

www.mathworlds.com.

www.sosmath.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator:

Associate Prof. Sameh Shenawy

Head of the Department:

Prof. Lila Soliman

Date:

September 2018

Course Specification

MTHN209: Mathematics -9(Applications Advanced Calculus)

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Basic Scienc Department
Date of specifications approval:	September, 2018

B - BASIC INFORMATION

Title: Applications Advanced Calculus	Code: MTHN209	Level: 2	Semister: 6 th
Hours Credit/Total 3hrs	Lectures 2hrs	Tutorial 2hrs	Practical —
Pre-requisite: MTHN103			

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

A study of this course aims to realize the basic concepts in functions of many independent variables and its partial derivative with applications and to realize the basic concepts of multiple integrals

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Applications of partial derivatives to physical and Engineering problems. (A1, A5)
- a2- Rule of multiple integrals. (A1, A5)
- a3- Basic concepts, classification and canonical form of PDEs (A1, A5)
- a4- Basic concepts of spherical and cylindrical coordinates. (A1, A5)
- a5- Method of separation of variables for heat, wave and Laplace equations. (A1, A5)
- a6- Solution of PDEs using Laplace trans form. (A1, A3)

b - Intellectual skills:

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

- b1- apply applications of partial derivatives to Engineering problems. (B1, B2)
- b2- choose the right decision by choosing the best kind of multiple Integration in applications. (B1, B2, B3)
- b3- use vector analysis to evaluate line integrals and surface integrals for a vector function. (B2)
- b4- apply the method of separation of variables to solve heat, wave and Laplace equations. (B1, B3, B4)
- b5- solve PDEs using Laplace transform. (B2, B3, B4)

c - Professional and practical skills:

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

- c1- apply multiple Integration in electronics. (C1, C12)
- c2- apply vector analysis to find the work done by the force field in electrical problem. (C1, C12)
- c3- solve partial differential equations describing real systems. (C1, C12)

d - General and transferable skills:

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

- d1- communicate effectively. (D3)
- d2- search for information. (D7)

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A1, A5
B Intellectual skills	B1, B2, B3 , B4
C Professional and practical skills	C1, C12
D General and transferable skills	D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Functions of several variables	2	2	
Functions of several variables	2	2	—
Partial derivatives	2	2	—
Directional derivatives	2	2	—
Taylor polynomials	2	2	—
Lagrange multiplier max, and min. of functions	2	2	—
Multiple integrals (double, triple integrals)	3	3	
Introduction to PDEs, Basic concepts of PDEs	2	2	—
Classifications and conical forms of 2 nd order linear PDEs.	2	2	
Method of separation of variables for heat equation.	3	3	—
Wave and Laplace equations.	2	2	—
D'Alembert solution of wave equation.	2	2	
Solution of PDEs using Laplace transforms.	1	1	
Total hours	28	28	—

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods				Learning Methods	Assesment Method		
		Lecture	Discussions and seminars	Tutorials	Problem solving	Researches and Reports	Written Exam	Quizes	Assignments
Knowledge	a1	1	1	1	1				1
	a2	1	1	1	1	1	1	1	1
	a3	1	1	1	1	1	1	1	1
	a4	1		1	1	1	1	1	1
	a5	1		1	1		1	1	1
	a6	1	1	1	1		1	1	1
Intellectual	b1	1	1		1		1	1	1
	b2	1	1	1	1		1	1	1
	b3	1	1	1	1	1	1	1	1
Applied	c1	1	1			1	1		
	c2	1	1			1	1		
General	d1		1	1		1	1		1
	d2	1			1	1	1		1

5- Assessment Timing and Grading:

Asessement Method	Timing	Grade (Degrees)
Semester Work: seminars, assignments and reports	Bi-Weekly	20
Quizes	5 th and 11 th weeks	20
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:**6-1 Course notes:**

Sameh Shenawy, Applications of Advanced Calculus, Lecture Notes, Modern Academy Press, Cairo, 2020.

6-2 Required books

Kreyszig, E. (2011) Advanced Engineering Mathematics. John Wiley, New York.

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

www.mathwords.com.

www.khanacademy.org/math

www.sosmath.com

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator:

Associate Prof. Sameh Shenawy

Head of the Department:

Prof.Dr. Lila Soliman

Date:

September 2018

Modern Academy

for Engineering and Technology in Maadi



Course Specification PHYN001 : Physics I

A- Affiliation

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

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

Department offering the course: Basic Sciences Department.

Date of specifications approval: December 2018

B - Basic Information

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

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1- the basic principles of rotational motion, application of rotational motion. (A1, A2, A3)
- a2- laws of planetary motion derived from the law of gravity and deriving a general expression for gravitational potential energy. (A1, A2, A3)
- a3- how objects deform under load condition and defining of several elastic constants for different types of deformation. (A1, A2, A3)
- a4- fluid in motion and its description by using a model with certain simplifying assumptions. (A1, A2, A4)
- a5- Bernoulli's equation and its Application. (A1, A2)
- a6- description of thermal phenomena through important terms; temperature, heat & internal energy. (A1, A2)
- a7- the concept of internal energy and the process by which energy is transferred. (A1, A2, A13)
- a8- the first law of thermodynamic and some important applications of this law. (A1, A2, A3)
- a9- the kinetic theory of gas, entropy and engine efficiency. (A1, A2, A3)
- a10- fundamental of wave motion and sound wave. (A1, A2)

B - Intellectual skills

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

- b1- analyze and solve a wide variety of problems of the related subjects listed above, justify the suitability and limitations of the studied equations, and select the most appropriate equations for problem solutions. (B1, B2, B3)
- b2- predict the different laws that governing the motion of the body (Newton's laws, gravity law, and kepler's law). (B1, B2 , B7)
- b3- analyze the characteristics of elastic materials. (B17)
- b4- deduce models for fluid flow and analyze some practical situation. (B7, B13)
- b5- differentiate and compare the different types of heat transfer in different walls. (B7, B13)

- b6- identify the system's internal energy changes by an energy transfer or by work done. (B1, B2, B7)
b7- differentiate and compare the different types of waves. (B1, B2, B20).

C - Professional and practical skills

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

- c1- analyze physical phenomena and solve problems depending on the gained background and concepts. (C1)
c2- validate the concepts of some of the studied physical phenomena C1, C12, C16)
c3- determine different dimensions using vernier calipers, micrometer and spherometer. (C16, C17)
c4- use experimental facilities to measure the acceleration due to gravity and the force constant. (C6, C12, C16, C17)
c5- perform experiments on heat to get practically the specific heat of different materials, the expansion coefficient of a solid, and the viscosity of a viscous liquid. (C1, C16, C17)
c6- determine the velocity of sound in air using resonance tube. (C1, C16, C17)
c7- use experimental facilities to verify the inverse square law of radiation. (C1, C16, C17)

D - General and transferable skills

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

- d1. communicate and interact effectively with other people and in a small group. (D1, D3, D5)
d2. use computing and information technology, and synthesize information. (D4, D7, D8)
d3. develop reasoned and scientific arguments. (D2, D6)
d4. manage resources and time, and work within a deadline. (D2, D6)
d5- search for information's in references and in internet. (D7, D8, D9)
d6- practice self-learning. (D5, D6, D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A13
B	Professional and practical skills	B1, B2, B3, B7, B13, B17, B20
C	Intellectual skills	C1, C6, C12, C16, C17
D	General and transferable skills	D1, D2, D3, D4, D5, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Rotational motion, angular displacement, velocity, acceleration.	2		
➤ Relation between linear and angular quantities.	1	1	4
➤ Applications on rotational motion.	2	1	
➤ Universal gravitational law.	1	1	2
➤ Kepler's laws.	2	1	
➤ Gravitational energy.	1		
➤ Escape speed and orbital energy.	1	1	
➤ Elasticity: Linear, and shear deformation.	1		2
➤ Bulk deformation, and energy stored in a wire.	2	2	4
➤ Characteristics of fluids and stream lines.	1	1	2
➤ Fundamental laws of fluid	2	1	
➤ Applications on Bernoulli's equation.	2	1	2
➤ Viscosity and Poiseuille's law.	1	1	2
➤ Heat transfer by convection.	1		
➤ Heat transfer by conduction.	2	1	2
➤ Work and heat in thermodynamic system.	1		
➤ First law of thermodynamic.	1		
➤ Isothermal expansion of gases and Molar specific heat.	2	1	2
➤ Mathematical representation of waves and speed of transverse waves.	1		2
➤ The principle of superposition.	1		
➤ Standing waves and Sound waves.	1	1	4
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method						
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments		Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizes	Term papers	Assignments		
Knowledge	a1	1		1	1	1	1		1				1	1	1	1	1		
	a2	1		1	1	1	1		1				1	1	1	1	1		
	a3	1		1	1	1	1		1				1	1	1	1	1		
	a4	1		1	1	1	1		1				1	1	1	1	1		
	a5	1		1	1	1	1		1				1	1	1	1	1		
	a6	1		1	1	1	1		1				1	1	1	1	1		
	a7	1		1	1	1	1		1				1	1	1	1	1		
	a8	1		1	1	1	1		1				1	1	1	1	1		
	a9	1		1	1	1	1		1				1	1	1	1	1		
	a10	1		1	1	1	1		1				1	1	1	1	1		
Intellectual	b1	1		1	1	1	1		1				1	1	1	1	1		
	b2	1		1	1	1	1		1				1	1	1	1	1		
	b3	1		1	1	1	1		1				1	1	1	1	1		
	b4	1		1	1	1	1		1				1	1	1	1	1		
	b5	1		1	1	1	1		1				1	1	1	1	1		
	b6	1		1	1	1	1		1				1	1	1	1	1		
	b7	1		1	1	1	1		1				1	1	1	1	1		
Applied	c1			1	1	1	1		1				1	1	1	1	1		
	c2						1							1			1		
	c3						1							1					
	c4						1							1					
	c5						1							1					
	c6						1							1					
	c7						1							1					
General	d1	1	1	1			1		1										
	d2		1	1		1			1								1		
	d3	1		1		1	1		1							1	1		
	d4					1							1	1	1		1		
	d5			1		1			1							1			
	d6					1			1				1	1	1	1	1		

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

- PHYN001, Physics I.

- Physics Lab (1) Note.

6-2 Required books

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

<http://www.saunderscollege.cpm/physics>

http://en.wikipedia.org/wiki/Bernoulli_principle

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

<http://physicsworld.com/>

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

<http://physics.info/>

7- Facilities required for teaching and learning:

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

Course coordinator:

Dr. Mohamed Eltawab

Head of the Department:

Prof. Dr. Laila Soliman

Date:

December 2018

Course Specification PHYN002: Physics II

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the Course:	Basic Sciences Department
Date of specifications approval:	Dec, 2018

B - BASIC INFORMATION

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

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Fundamental and basic law of applications in electricity, magnetism and electromagnetism (A1 and A3).
- A2- GAUSSES LAW IN ELECTRICITY FOR DIFFERENT TYPE OF CHARGED BODIES (A1 AND A3).
- A3- LAWS OF ELECTRIC CAPACITORS AND EFFECT OF DIELECTRIC (A4 AND A5).
- a4- Direct current, resistance and solution of simple electric circuits and kerchief's laws (A4 , A5, A13, A14, and A15)
- a5- Analogy between magnetic field and electric field., and application of Ampere's law, Gausse's law in magnetism (A3, A4, A14 and A15).
- a6- Magnetic properties of matter (A3, A5, A13, and A15).
- a7- Fundamental theories of Electro-magnetic waves and main physical phenomena of physical optics (interference, diffraction and polarization) (A24) .

b - Intellectual skills:

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

- b1- Investigate electric force and electric field (using Gauss's law) and select the proper manner to solve problem (B2, B3, B4, and B13).
- b2- Study of capacitors' and dielectric effect, uses of capacitors, and use Kirchhoff's laws to solve simple electric circuits (B3, B5, B6, and B15).
- b3- Investigate and compare electric field, magnetic field, and magnetic force using Gauss law in magnetism and Ampere's law; studying the nature of each, and identify magnetic properties and studying electromagnetic wave (B3, B5, and B15).

c - Professional and practical skills:

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

- c1- Identify ohms law practically, and comparison between two nearly equal resistance by carry-foster bridge (C1, C5, C8, and C11).
- c2- Determine time constant for (Rc) circuits (C1, C5, and C11).

- c3- Determine power, focal length for lenses and mirrors (convex and concave) (C1, C5, and C11).
c4- Perform a physical experiment (Absorption co-efficient, polarization and Newton's rings) (C1,C5, C11, and C14).

d - General and transferable skills:

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

- d1- Write technical reports(D5)
d2- Use libraries information's in subjects (D1)
d3- Use the E-mail and internet (D3, D4, and D7).

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A1, A3, A4, A5, A13, A14, A15, A24
B Intellectual skills	B2, B3, B4, B5, B6, B13, B15
C Professional and practical skills	C1, C5, C8, C11, C14
D General and transferable skills	D1, D3, D4,D5, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Charge and Matter, The Electric Field, Gauss' law	2	1	2
➤ Gauss's law, Electric Potential	2	1	2
➤ Gauss's law applications	2		2
➤ Capacitors and Dielectric	2	1	2
➤ Current and Resistance, Electromotive force and Circuits	2	1	2
➤ The Magnetic Field, Ampere's Law	2	1	2
➤ Ampere's law, Inductance	2	1	2
➤ Magnetic Properties of matter	2	1	2
➤ Magnetic Properties of matter, Electromagnetic Waves	2	1	2
➤ Electromagnetic Waves	2	1	2
➤ Electromagnetic Waves, Physical Optics, Polarization of light	2	1	2
➤ Polarization of light	2	1	2
➤ Interference of light	2	1	2
➤ Interference of light, Diffraction of light	1	1	2
➤ Diffraction of light, Some applications	1	1	2
Total hours	28	14	28

Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments			Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1		1	1	1	1			1				1	1	1	1	1			
	a2	1			1	1								1		1	1	1			
	a3	1			1	1	1							1	1	1	1	1			
	A4	1			1	1	1							1	1	1	1	1			
	a5	1		1	1	1				1				1			1	1			
	a6	1		1	1	1				1				1			1	1			
	a7	1		1	1	1	1			1				1	1		1	1			
Intellectual	b1	1			1	1								1		1	1	1			
	b2	1			1	1								1		1	1	1			

	b3	1		1	1						1						1				
Applied Professional	c1	1			1		1				1					1		1	1		
	c2	1			1	1	1				1					1		1	1		
	c3	1			1		1				1					1		1	1		
	c4	1			1		1				1					1		1	1		
General Tran Skills	d1	1		1		1					1						1	1			
	d2			1							1						1	1			
	d3			1							1						1	1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi- Weekly	20
Mid-Term Exam	8-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references

6-1 Course notes: Non

6-2 Required books

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

6-3 Recommended books:

- David Halliday, Robert Resnick, 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.

6-4 Periodicals, Web sites, etc.

Non

7- Facilities required for teaching and learning:

- Physics Lab.
- Computer, and Data show

Course coordinator:

Dr. M El- Tawab Kamal

Head of the Department:

Dr. Laila Soliman

Date:

25 / 12 / 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification ELCN216: Electro - Engineering

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Electronic Engineering and Communication Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Electro - Engineering	Code: ELCN216	Year/level: Junior, first Semester
Credit Hours: 3	Lectures: 2	Tutorial: 2 Practical: 1
	Pre-requisite: PHYN002	

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to give the students needed Electric analysis knowledge necessary to handle mechanical equipment designed with electric integrations, through providing them with the needed knowledge and skills. Electric and magnetic fields, handling of electric and electronic circuits, propagation of electric quantities, Electric and magnetic forces and few practical applications, in each, are the subjects of this course.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Classification and specifications of electric quantities (A2)
- a2- Basic properties of circuits and electromagnetism (A2, A5)
- a3- Construction and propagation of waves on circuits, wires and in ether (A2, A3).
- a4- Background and basics of electric circuit analysis (A1).
- a5- Circuits and electronic actions (A2, A3)
- a6- Magnetic forces and its relation to machine actions (A1, A4).

b - Intellectual skills:

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

- b1- Investigate the effect of currents, electric and magnetic fields on electromechanical arrangements including relays, motors and electromagnetic fundamentals (B1, B13)
- b2- Deduce mathematical relations describing the currents and electromagnetic effects with basics of motor and generator actions (B1, B2, B13, B15)
- b3- Analyze electric and electronic circuits with capabilities to apply to useful instruments, motors and radiators (B5, B9, B14)

c - Professional and practical skills:

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

- c1- Design, assemble, operate, test and maintain Electric and electronic circuits (C3, C12)
- c2- Calculate electric, electronic and mechanical actions of useful electromechanical arrangements (C1).
- c3- Use computer software; using Matlab and LabVIEW to implement preliminary designs of useful electromechanical interactions (C5).
- c4- Solve operational problems related to electric and electronic circuits (C1, C8, C11).
- c5- Use experimental facilities to implement useful electric, electronic and machinery circuits (C16, C12).

d - General and transferable skills:

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

- d1- Communicate effectively; work in a team and involvement in multidisciplinary teams by attending lectures, tutorials and labs, with combined electric and mechanical applications (D3, D1).
- d2- Present engineering data and results orally and in written form (D3, D9).
- d3- Search for information's in references and in internet (D7).
- d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5
B	Intellectual skills	B1, B2, B5, B9, B13, B14, B15
C	Professional and Practical Skills	C1, C3, C5, C6, C12, C16, C17
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Currents and fields, classification, operation, and comparison.	1	1	1
➤ Introducing electromagnetic standard.	2	2	1
➤ Currents and fields; properties and effects.	1	2	1
➤ Transmission lines and propagation.	2	1	1
➤ Electric and electronic circuits:	2	2	1
• Classification and basic mathematical relations	1	1	
• Op Amps and transistors.	2	2	1
• Fields and electromechanical actions.	1	1	1
➤ Electric Forces and radiated fields:	1	2	1
• Classification and basic designs.	1	1	
• AC and DC arrangements.	2	2	1
• Directional propagation in air and on wires.	2	2	1
• Control of actions.	2	2	
• Check tests.	2	1	
➤ Applications with LabVIEW	2	2	1
➤ Digital applications and stepper motors.	2	2	1
➤ Case studies; design and analysis of practical circuits and motor systems.	2	2	2
Total hours	28	28	14

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods									Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam
Knowledge & Understanding	a1	1	1	1								1					1	1		1		1
	a2	1			1	1											1	1		1		1
	a3	1	1	1	1	1						1					1	1	1	1	1	1
	a4	1	1	1							1	1					1	1		1		1
	a5	1		1	1	1						1					1	1		1		1
	a6	1	1	1	1	1						1					1	1		1		1
Intellectual Skills	b1	1	1		1	1						1					1	1		1		1
	b2	1			1	1					1						1	1		1		1
	b3	1	1		1	1											1	1		1		1
Ge Applied Prof. Skills	c1	1	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						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	
General	d1	1	1	1								1					1					

d2	1	1	1	1	1							1					1			1		1
d3				1	1							1					1					
d4		1										1					1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, Quizzes& Reports	Weekly	20
Mid-Term Exam	8-th Week	20
Lab & Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

Mostafa AFIFI, Electro-Engineering, Modern Academy for Engineering &Technology, Cairo, 2013-2014.

6-3 Recommended books:

R. Feynman, R. Leighton and M.L. Sand, "Feynman lecture on physics, Reading Mass", Addison-Wesley.1989.

Allan Hambley, Electrical Engineering, Principles and Applications, Prentice Hall, 2002.

6-4 Periodicals, Web sites, etc.

IEEE periodicals, and Internet

7- Facilities required for teaching and learning:

- Circuit Lab, MATLAB, and machinery Lab.
- Computers, Data show and Computer programs; within the lecture room.

Course coordinator:

Prof. Dr. Ir. Mostafa S. AFIFI

Head of the Department:

Dr. Mokhtar Abd-AL Halim

Date:

September 2018

Modern Academy for Engineering
and Technology in Maadi



Course Specification

ELCN217: Electrical Machines

A- Affiliation

Relevant program: *Manufacturing Engineering and Production Technology B.Sc. Program.*
Department offering the program: *Manufacturing Engineering and Production Technology Department.*
Department offering the course: *Electronic Engineering and Communication Technology Department.*
Date of specifications approval: *October, 2018.*

B - BASIC INFORMATION

Title: Electrical Machines Code: ELCN217 Level: Junior, Second Semester
Credit Hours: 3 Lectures: 2 Tutorial/Exercise: 1 Practical: 2
Pre-requisite: ELCN216

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives:

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

2 – Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Ampere's law and Magnetic fields properties. (A1)
- a2- Self inductance and mutual inductance definition and equations. (A2)
- a3- Magnetic materials characteristics. (A3)
- a4- Magnetic circuits analysis. (A4, A5)
- a5- Construction and theory of operation of transformers. (A1, A4)
- a6- Ideal and real transformers analysis. (A4, A5)
- a7- Construction of direct current machines. (A1, A4)
- a8- Classification of direct current machines (shunt, series, and compound connections). (A14)
- a9- Rotational motions equations, equivalent circuits, and the speed control of alternating current machines. (A5, A16, A17)
- a10- Three phase induction machine theory of operation, equivalent circuit, performance, torque speed characteristics. (A1, A5)
- a11- Synchronous machine operation, equivalent circuit, and voltage regulation. (A1, A5)
- a12- Automobile alternators performance and operations with variable loads (A1, A4).
- a13- Single phase motors construction, equivalent circuit, and torque-speed characteristics (A1, A5).
- a14- Stepper motors operation and control (A16, A17).

b - Intellectual skills:

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

- b1- Find the equivalent circuits of transformer and machines (B11).
- b2- Allocate any fault and know its reason (B6, B9).
- b3- Calculate the suitable machine parameters necessary for specific load (B2).
- b4- Choose the suitable operating torque-speed point for best machine performance (B3).
- b5- Calculate transformer and machines efficiency (B2).
- b6- Design a simple stepper motor controller (B3).

c - Professional and practical skills:

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

- c1- Measure equivalent circuit parameters of transformer and machines. (C1, C5)
- c2- Measure efficiency of transformer and machines. (C1, C5)
- c3- Measure voltage-current characteristics of generators. (C1, C4, C5)

- c4- Measure torque-speed characteristics of motors. (C1, C4)
- c5- Control torque-speed characteristic of three phase induction machines. (C8)
- c6- Test synchronous generator synchronization with grid. (C8)

d - General and transferable skills:

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

- d1- Communicate effectivity through assignment (D3).
- d2- Work in stressful environment and within constraints (D2).
- d3- Effectively manage tasks, time, and resources (D6).
- d4- Search for information and engage in life-long self-learning discipline (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5, A14, A16, A17
B	Intellectual skills	B2, B3, B6, B9, B11
C	Professional and practical skills	C1, C4, C5, C8
D	General and transferable skills	D2, D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Basic magnetic field laws.	2	1	-
➤ Magnetic material characteristics.	1	-	-
➤ Magnetic circuit and transformer analysis.	2	2	4
➤ DC machine construction and operation.	2	2	2
➤ DC machine classification and applications	3	1	3
➤ AC machine operation and equivalent circuit.	3	2	2
➤ Speed control of AC motors.	2	-	3
➤ Three phase motors operation and equivalent circuit.	3	2	2
➤ Torque-speed characteristics of AC motors.	1	-	3
➤ Synchronous machine operation and equivalent circuit.	2	2	4
➤ Automobile alternators.	2	-	2
➤ Single phase motors.	3	2	2
➤ Stepper motor operation	2	-	1
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods					Learning Methods		Assesement Method					
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizes	Term papers	Assignments
Knowledge & Understanding	a1	1			1	1				1				
	a2	1			1	1				1				1
	a3	1								1			1	1
	a4	1			1	1					1			
	a5	1	1		1		1	1		1			1	
	a6	1										1	1	
	a7	1	1				1			1		1		
	a8	1			1	1	1			1	1		1	
	a9	1			1	1				1		1		1
	a10	1			1	1	1			1	1			1
	a11	1	1		1	1	1			1	1			1
	a12	1								1				
	a13	1			1	1				1		1	1	
	a14	1			1					1				1
Intellectual Skills	b1	1			1	1	1			1		1		1
	b2	1					1			1	1			
	b3	1			1					1				1
	b4	1					1			1	1			1
	b5	1			1		1			1		1		1
	b6				1		1				1			
Applied Professional Skills	c1						1				1			
	c2						1				1			
	c3						1				1			
	c4						1				1			
	c5	1			1		1				1		1	
	c6	1					1				1			
General Tran. Skills	d1	1			1						1		1	
	d2						1				1			
	d3						1							
	d4	1												

5- Assessment Timing and Grading:

Assesment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20%
Mid-Term Exam	6-th Week	20%
Practical Exam	Week 13	20%
Written Exam	Week 15	40%
Total		100%

6- List of references:

6-1 Course notes:

- H. Gamal, Electrical Machines, Cairo, 2012.
- H. Gamal, Electrical Machines, Practical Part, Cairo, 2012.

6-2 Required books

- "Electrical Engineering, Principle and Application", 2nd edition, Part-4, 2002.

6-3 Recommended books: None.

6-4 Periodicals, Web sites, etc.

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

7- Facilities required for teaching and learning:

- Electrical Machines Lab.
- Data Show.

Course coordinator: Dr. Haytham Gamal Mohamed.

Dr. Esam Zaki.

Head of the Department: Prof. Dr. Nabil Gadallah.

Date: 5 / 1 / 2019.

Course Specification MECN 001: Mechanics-1

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic SciencDepartment
Date of specifications approval:	September, 2018

B - Basic information

Title: Mechanics-1	Code: MECN 001	Level: Senior 2.	Semester: Frist.
Hours Credit/Total 2 hrs	Lectures 2 hrs	Tutorial 3 hrs	Practical Non

C - Professional information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- knowledge of the basic of statics in plane and space (A1, A2).
- a2- knowledge the difference between the moment of force in plane and space (A2, A4).
- a3- classification the support reaction in plane and in space (A1, A2).
- a4- understanding the structural analysis in plane (A3, A4).

b - Intellectual skills:

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

- b1- analyze and classify between equilibrium in plane and equilibrium in space (B1, B2).
- b2- classify and compare the different between equilibrium of a single rigid body and all forces involved were external to the rigid body (B1, B2) .

c - Professional and practical skills:

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

- c1- solve the equations of equilibrium to get three unknownes (C1, C2).
- c2- solve the trusses to get the value of the forces in the structural by joints and by section methods (C1, C2).

d - General and transferable skills:

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

- d1-work in a team to solve problem as a search(D1).
- d2- search for information in references and in internet(D2)

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A1, A2, A3, A4
B Professional and practical skills	B1, B2
C Intellectual skills	C1, C2
D General and transferable skills	D1, D2

3 – Contents

Topic	Lecture hours	Tutorial hours
➤ Basic Concepts of statics.	1	2
➤ Resultant of concurrent forces in plane	1	3
➤ Resultant of concurrent forces in space	1	4
➤ Equilibrium of a particle (in plane and in space)	1	4
➤ Different types of support in plane	1	3
➤ Distributed loads	1	3
➤ Equilibrium of rigid body in plane	1	2
➤ Different types of supports in space	1	4
➤ Equilibrium of rigid body in space	2	4
➤ Special cases of two, three and four force members	1	4
➤ Analysis of Trussess by the method of joints	1	4
➤ Analysis of Trussess by the method of section	1	4
➤ Final revision	1	1
Total hours	14	42

4 – Teaching, Learning and Assesementmethods:

Course ILO's		Teaching Methods								Learning Methods				Assesement Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments			Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizes	Term papers	Assignments			
Knowledge	a1	1			2	1				1				1		1	1	1			
	a2	1			2	3								1		1	1	1			
	a3	1			3	3				1				1		1	1	2			
	a4	2			4	1				1				1		1	1	1			
Intellectual	b1	2			4									1		1		1			
	b2	2			4	1								1		1	1	1			
Applied	c1	2			4	3								1		1	1	1			
	c2	2			4									1		1	1	1			
General	d1					1				1							1				
	d2									1							1				

5- Assessment Timing and Grading:

Asessment Method	Timing	Grade (Degrees)
Semister Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Secand Mid-Term Exam	12-th Week	20
Written Exam	Fifteen week	40
Total		100

6- List of references:

6-1 Course notes: found

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

6-2 Recommended books

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

6-4 Periodicals, Web sites, etc.

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

Course coordinator:	Professor Dr Moamen Wafaie
Head of the Department:	Prof. Laila Soliman
Date:	September 2018

Course Specification

MECN 002: Mechanics-2

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Basic Science Department
Date of specifications approval:	September, 2019

B - Basic information

Title: Mechanics-2	Code: MECN 002	Level: First/Second.	Semester: First / Second
Hours Credit/Total 3 hrs	Lectures 2 hrs Tutorial 2 hrs		

C - Professional information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

- b1- analyze and classify between the force acting on the system to get its value and the principle of work and energy to get the velocity of the particle (B1, B2)
- b2- classify and compare the difference between the average velocity and average speed (B5, B13, B15).

c - Professional and practical skills:

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

- c1- solve the equation of motion to get velocity, acceleration and total distance traveled at any time. (C1, C3)
- c2- calculate the time of flight of projectile to get a target. (C1, C5).
- c3- solve the equation of motion graphically. (C3)

d - General and transferable skills:

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

- d1- work in a team to solve problem as a search. (D1, D2)
- d2- search for information in references and in internet (D2).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5
B	Professional and practical skills	B1, B2, B5, B13, B15
C	Intellectual skills	C1, C2, C3
D	General and transferable skills	D1, D2

3 – Contents

Topic	Lecture hours	Tutorial hours
➤ Rectilinear Motion of particles.	1	4
➤ Determination of the motion of a particle.	1	4
➤ Graphical Solution of Rectilinear Motion.	1	4
➤ Curvilinear Motion of particle, Free Flight Motion.	2	4
➤ Curvilinear Motion of particle:		
➤ Normal and Tangention.	1	4
➤ Plane Curvilinear Motion.	1	4
➤ Polar Coordinates.	1	4
➤ Kinetics of Particles, Force and acceleration.	2	4
➤ Kinetics of Particles Energy and Momentum Methods	2	4
➤ Motion under a conservative central force.	1	4
➤ Principle of Impulse and Momentum for particle.	1	2
Total hours	14	42

4 – Teaching, Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assesment Method									
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizes	Term papers	Assignments			
Knowledge	a1	1			1	1					1				1		1	1	1				
	a2	1			1	3									1		1	1	1				
	a3	2			2	3					1				1		1	1	2				
	a4	1			1	1					1				1		1	1	1				
	a5	2			2										1		1	1	1				
Intellectual	b1	2			2										1		1		1				
	b2	1			1	1									1		1	1	1				
Applied	c1	1			1	3									1		1	1	1				
	c2	1			1										1		1	1	1				
	c3	1			1	1												1	1				
General	d1					1					1							1					
	d2										1							1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, assignments and reports	Bi-Weekly	20
Quizzes	5 th and 10 th	20
Mid-Term Exam	7-th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: found

6-2 Required books:

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

R.C. Hibbeler Engineering mechanics, Dynamics.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

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

Course coordinator:	Professor Dr Shimaa Lotfy
Head of the Department:	Dr Laila Soliman
Date:	September 2019

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN001: Introduction to Engineering Materials

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program Electronic Engineering and Communication Technology BSc Program Computer Engineering and Information Technology BSc Program Architecture Engineering and Building Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department Electronic Engineering and Communication Technology Department Computer Engineering and Information Technology Department Architecture Engineering and Building Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Introduction to Engineering Materials	Code: MNFN001	Level: Freshman, First Semester
Credit Hours: 1	Lectures: 1	Tutorial/Exercise:- Practical: -
	Pre-requisite: -	

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Basic information of atomic structure (A2)
- a2- Characteristics of engineering materials related to the discipline (A3).
- a3- Principles of ferrous and non-ferrous alloys (A4)
- a4- Basic properties of copper and aluminum alloys (A3).
- a5- Engineering design principles for selection of material (A18).

b - Intellectual skills:

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

- b1- Investigate the required properties to choose the material (B1, B13)
- b2- Select appropriate solutions for engineering problems based on analytical thinking (B2)
- b3- Assess and evaluate the characteristics and performance of component material (B5)
- b4- Use the principle of engineering science in selection of the required properties (B15,B17).

c - Professional and practical skills:

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

- c1- Solve some simple production problems related to material and process selection (C19)
- c2- Apply knowledge of materials to determine the suitable used materials (C1).
- c3- professionally merge the engineering knowledge to improve material properties (C2).

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A3, A4, A18
B	Intellectual skills	B1, B2, B5, B13, B15, B17
C	Professional and Practical Skills	C1, C2, C19
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, and reports	Bi-Weekly	20
Mid-Term Exam	8-th Week	20
quizzes assignments	Bi-weekly	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Introduction to Engineering Material (Lecture Notes)

6-2 Required books : David G. Rethwisch, "Fundamentals of Materials Science and Engineering", Wiley, Asia, 2013

6-3 Recommended books: William D. Callister, "Fundamentals of Materials Science and Engineering", Wiley, USA, 2005

6-4 Periodicals, Web sites, etc.

http://simple.wikipedia.org/wiki/Materials_science

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

<http://www.homework-help-secrets.com/atomic-structure.html>

7- Facilities required for teaching and learning:

- Lecture Room
- Computer, Data show.

Course coordinator:

Dr. Nasr Aref

Head of the Department:

Prof.Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN002: Engineering Graphics

A- Affiliation

Relevant program:	Mechanical Design and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Engineering Graphics	Code: MNFN002	Year/level: freshman, first semester
Credit Hours:3	Lectures: 1	Tutorial:6 Practical: -
	Pre-requisite: Non	

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

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

B - Intellectual skills

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

- b1- Solve and communicate problems in orthographic views. [B7]
- b2- Solve and communicate problems in isometric and oblique drawings. [B7]
- b3- Consider the benefits of solving problems of developments and intersections. [B5]
- b4- Draw different problems in sectional views. [B7]
- b5- Select the proper section for each component. [B8],[B9]
- b6- Draw dimensions for components from production point of view. [B3]

C - Professional and practical skills

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

- c1- Produce orthographic views from 3D models. [C2]
- c2- Read and understand orthographic drawing. [C3]
- c3- Prepare and interpret engineering drawing. [C4]
- c4- Read orthographic drawing with sectional views. [C4], [C11]
- c5- Make necessary views using sections and dimensioning. [C4], [C13]
- c6- Communicate by graphic language. [C4]

D - General and transferable skills

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	2, 4, 5, 8, 10
B	Intellectual skills	3, 5, 7, 8,9
C	Professional and Practical Skills	2, 3, 4, 11, 13
D	General and transferable skills	1, 3, 9

3 – Contents

Topic	Lecture hours	Tutorial hours
Drawing instruments, Draw sheets; Scales; Folding , Lettering	1	6
Geometric Construction	1	6
Alphabet of lines	1	6
Theory of orthographic projection: Projection of point ; line and plane Projection of geometric solids	1	6
Multi view drawing (of Vertical and Horizontal Surfaces)	1	6
Multi view drawing (of inclined Surfaces)	1	6
Multi view drawing (of cylindrical Surfaces)	1	6
Pictorial drawing (isometric) , Pictorial drawing (oblique)	1	6
Isometric drawing (of Vertical, Horizontal & inclined Surfaces)	1	6
Isometric drawing (of cylindrical Surfaces)	1	6
Conventional practice in ED	1	6
Importance of drawing sections ; Basic types of sections: Full sections : longitudinal ,cross – section	1	6
Off set ; Aligned sections ; Half-section ;Partial S.; Revolved & Auxiliary sections.	1	6
Dimensioning – Arrangements of dimensions – Rules for dimensions of circles ; radii ; angles ; plain holes	1	6
Total hours	14	84

4 - Teaching and Learning and Assessment methods:

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

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Assignments and Home works	Weekly	20
Quizzes	Bi-Weekly	20
Mid-Term Exam	6 th . Week	20
Written Exam	16 th . week	40
Total		100

6- List of references:

6-1 Course notes

Engineering Drawing by : Prof. Mamdouh Saber

6-2 Required books

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

6-3 Recommended books Non

6-4 Periodicals, Web sites etc . Non

7- Facilities required for teaching and learning:

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

Course coordinator: Prof.Dr. Nabil Gadallah

Head of the Department: Prof.Dr. Nabil Gadallah

Date: September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN003: Principle of Production Engineering

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Mechanical Engineering Department Electrical Engineering Department Architectural Engineering Department
Department offering the course:	Mechanical Engineering Department
Date of specifications approval:	November, 2018

B - Basic Information

Title: Principle of Production Engineering	Code: MNFN003	Year/level: Level zero
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:-
	Practical: 3	Total: 5
	Pre-requisite: MNFN 001	

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Basic production methods related to casting, metal forming processes, welding and metal cutting (A1)
- a2- Design pattern, allowances in casting & solidification (A4).
- a3- Fundamental of centrifugal casting process (A2)
- a4- Classification of welding process (A1).
- a5- Basic methods of hot and cold forming (A1)
- a6- Applications of metal cutting processes (A1)

b - Intellectual skills:

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

- b1- Select the proper manufacturing process for a specific product (B2)
- b2- Design the pattern for sand casting (B3)
- b3- Choose the suitable welding method or different joining (B18)
- b4- Use the principle of production engineering in producing good quality cheap product (B10, B2)

c - Professional and practical skills:

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

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

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A2,A4.
B	Professional and practical skills	B2,B3,B10,B18.
C	Intellectual skills	C1, C3,C7.
D	General and transferable skills	D1,D3,D7,D9.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Role of production engineering, production system objective, types of industries, classification of manufacturing processes .	2		
➤ Sand casting, melting of metal & furnaces. Solidification, pattern allowances, sand molding & gating system. Die casting, centrifugal & investment casting.	6		12
➤ Types of welding, oxy- acetylene welding, electric- arc welding, submerged arc welding, MIG, TIG, resistance welding, soldering & brazing	5		10
➤ Hot & cold forming, rolling, extrusion, wire drawing & sheet metal forming	5		5
➤ Metal cutting processes (Turning, milling, shaping, grinding and drilling)	10		15
Total hours	28		42

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:

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

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

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.:

7- Facilities required for teaching and learning:

- Lecture room , and workshops

Course coordinator: Prof. Dr. Ahmed Kohail
Dr. Maher Khalifa

Head of the Department: Prof. Dr.. Nabil Gad Alla

Date: November, 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN060: Summer training for level zero

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Mechanical Engineering Department
Department offering the course:	Mechanical Engineering Department
Date of specifications approval:	November, 2018

B - Basic Information

Title: Summer training for level zero	Code: MNFN060	Year/level: Level zero
Credit Hours: 0	Lectures: -	Tutorial/Exercise: total of 60 hours
	Practical: -	Total: 60 hours
	Pre-requisite: None	

C - Professional Information

1 – Course Learning Objectives:

By the end of this training the students should demonstrate the knowledge and understanding of the use of the AutoCAD package.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Basic commands in AutoCAD (Keyboard, menu and tool bars) (A2)
- a2- Saving drawings. (A4).
- a3- Drawing commands (Circles, Arcs, Rectangle, Ellipse, Regular polygon) (A2)
- a4- Editing commands (Erase, copy, move, rotate, mirror, fillet, chamfer, ...etc.) (A1).
- a5- Control drawing display and create text zoom command. (A1)
- a6- Fundamental dimensioning terms. (A10, A18)
- a7- Hatching and hatching edit. (A10, A18)

b - Intellectual skills:

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

- b1-Use of basic commands (B2, B8)
- b2- Save and edit drawings (B3)
- b3- Mark dimensions (B17)
- b4- Add hatching and hatch edit (B10, B2)

c - Professional and practical skills:

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

- c1- Create drawings using AutoCAD. (C1, C3, C17)
- c2- Add dimensions, hatching and create a block (C4, C13, C17).

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A2,A4, A10, A18.
B	Professional and practical skills	B2,B3,B8, B10,B17.
C	Intellectual skills	C1, C3, C4, C13, C17.
D	General and transferable skills	D1,D3,D7,D9.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Turn your comp, Commands in ACAD(Keyboard, Menu and tool bars), Starting a new drawing, opening an existing file, Saving your work, Application on some important commands, point and line commands, Different coordinate systems.		2	4
➤ Drawing commands (Circles, Arcs, Rectangle, Ellipse, Regular polygon.		2	4
➤ Drawing Aids: Setting units, Limits Command, Setup layers Drafting setting, Object Snap		2	4
➤ Editing Commands: Erase, Copy, Move, Rotate, Mirror, Fillet, Chamfer, etc...		2	4
➤ Controlling drawing display and creating text. Zoom command, Text and text commands, Drawing special characters, Editing text.		2	4
➤ Basic Dimensioning: Introduction, Fundamental dimensioning terms, Selecting dimension commands, Editing dimensions, Dimension style.		2	4
➤ Hatching and hatching edit		2	4
➤ Block and Wblock commands: Creating a block, converting objective into a block, Inserting block, Editing block, Renaming and deleting unused blocks.		2	4
➤ Inquiry commands and plotting. & Evaluation		4	8
Total hours		20	40

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method					
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning				Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam
Knowledge & Understanding	a1	x	x	x													x	x	x	x	x
	a2	x	x	x							x						x	x	x	x	x
	a3	x	x	x							x						x	x	x	x	x
	a4	x	x	x							x						x	x	x	x	x
	a5	x	x	x							x						x	x		x	x
	a6	x	x	x							x						x	x		x	x
	a7	x	x	x							x						x	x		x	x
Intellectual Skills	b1	x	x	x													x	x	x	x	x
	b2	x	x	x							x						x	x	x	x	x
	b3	x	x	x													x	x	x	x	x
	b4	x	x	x													x	x			x
Applied	c1	x		x															x	x	x
	c2	x	x																x	x	x

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN111: Mechanics of Materials

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Mechanics of Materials	Code: MNFN111	Year/level: 1 st Level/Semester1
Credit Hours: 3	Lectures: 2	Tutorial: 3 Total: 5
	Pre-requisite: MECN001	

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand the fundamental of kinds of applied loads, analyze the relation between stress and strain, calculation of various types of individual and combined stresses, thermal stresses and how to determine the deflection of beams.

2 – Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1 - Stress-strain for different Materials(A3).
- a2 - Types of loads and their diagrams. (Tensile, Bending, and Torsion).(A4)
- a3 - Theoretical background needed to find and calculate the center of gravity, first moment of inertia and second moment of inertia(A5).
- a4 - Types of stresses. (Tensile, Bending, and Torsion) (A13& A18)
- a5 - Stresses due to combined loading and their principal values.
- a6 - Thermal stresses. (A3& A13)
- a7 - Deflection of beams. (A5& A18)
- a8 - Selected topics. (A4, A5, A10, A13 and A18)

b - Intellectual skills:

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

- b1 - Use the international system of units. (B5)
- b2 - Analyze how the mechanical characteristics obtained in laboratory. (B6)
- b3 - Solve simple problems concerning statically determinate and indeterminate systems. (B7)
- b4 - Compare between the failures of mechanical elements subjected combined loads (B13, B14& B17)

c - Professional and practical skills:

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

- c1 - Carry out stress and strain analysis in tensile test, and other experimental tests (C5).
- c2 - Differentiate between different cross-sections and their properties. (C1)
- c3 - Evaluation of shear and Bending Diagrams for Beams(C3).
- c4 - Evaluate the safety factors of loaded mechanical elements. (C8)
- c5 - Perform standard technical reports. (C12)

d - General and transferable skills:

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

- d1 - Work in a team. (D1)
- d2 - Communicate effectively in written reports. (D3)
- d3 - Refer to relevant literatures. (Independent work). (D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A4, A5, A10, A13, A18.
B	Intellectual skills	B5, B6, B7, B13, B14, B17
C	Professional and Practical Skills	C1, C3, C5, C8, C12.
D	General and transferable skills	D1, D3, D9

3 – Contents

No	Topic	Lecture hours	Tutorial hours
1	➤ Loads and Reactions.(kinds of loads and types of supports)	2	3
2	➤ Tension and Compression stresses <ul style="list-style-type: none"> Mechanical Properties, Hook's Law Thermal Stress 	2	3
3	➤ Statically Indeterminate Force Systems. <ul style="list-style-type: none"> Compatibility Equation 	2	3
4	➤ Geometrical Characteristics of a Plane Figures. <ul style="list-style-type: none"> First Moment of Area The Centroid of an Area, Neutral Axis Moment of Inertia of Some Geometrical Shapes 	4	6
5	➤ Direct Shear Stress. <ul style="list-style-type: none"> Application of direct shear stress 	2	3
Mid Term (L:2hrs & Tutorial: 3hrs)			
6	➤ Torsional Stress. <ul style="list-style-type: none"> Twisting Moment, and Shear stress Angle of Twist. 	2	3
7	➤ Shearing Force and Bending Moment Diagrams. <ul style="list-style-type: none"> Internal Shear Force and Bending Moment Transverse Shear Stress 	4	6
8	➤ Bending Stress. <ul style="list-style-type: none"> Neutral Surface and Neutral Axis Bending Stress in Beams 	2	3
9	➤ Combined Stresses, principal Stresses. <ul style="list-style-type: none"> Principal Stresses, and Principal Planes Maximum Shearing Stress, and its Plane Mohr's Circle 	4	6
10	➤ Deflection of beams <ul style="list-style-type: none"> Different approach to find the deflection of beams 	2	3
11	➤ Selected Topics, (Spring, Thin walled Cylinder,)	2	3
Total hours		28	42

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method								
		Lecture	Presentations & Movies	Discussions	Tutorials	Problem solving	Brain storming					Modeling	Self-learning			Quizzes	Reports	Mid-Term	Practical Exam	Written Exam		
Knowledge & Understanding	a1	1		1	1	1										1		1		1		
	a2	1			1	1										1		1		1		
	a3	1			1	1										1		1		1		
	a4	1			1	1										1		1		1		
	a5	1			1	1										1		1		1		
	a6	1			1	1										1		1		1		
	a7	1			1	1										1		1		1		

Intellectual Skills	a8	1		1	1	1						1				1		1		1		
	b1	1			1											1		1		1		
	b2	1		1	1													1		1		
	b3	1			1											1		1		1		
	b4	1		1	1																	
Applied Prof. Skills	c1	1		1	1																	
	c2	1		1	1		1									1		1		1		
	c3	1		1	1											1		1		1		
	c4	1		1	1		1									1		1		1		
	c5	1		1	1		1															
General Tran Skills	d1			1								1										
	d2			1	1							1										
	d3				1							1										

5- Assessment Timing and Grading

Assessment Method		Timing	Grade (Degrees)
Semester Work	Class Work	Bi-Weekly	20
	Assignments	At Even weeks	10
	Quizzes	4 Times at 3 rd , 6 th , 9 th and 12 th Weeks	10
Mid-Term Exam		7-th Week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Printed Lectures in Mechanics of Materials, Modern Academy

6-2 Required books

WILLIAM A. NASH, Fifth edition, Strength of Materials, McGraw-Hill, 2011

R.K., Rajput, Engineering Material, S. Chand Company Ltd, New Delhi, India, Second Edition, 2004

R.C. Hibbler, Mechanics of Materials, Print ice Hall-Periodicals, Singapore, 2011

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

Course coordinator:

Assist. Prof. Eng. Ahmed Fouad EL Sanabary

Head of the Department:

Prof. Nabil Gadallah f

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN112 Fundamentals of Materials Science

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Fundamentals of Materials Science	Code: MNFN112	Level: Sophomore, First Semester
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:1 Practical: 2
	Pre-requisite: MNFN001	

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should be able to briefly describe ionic, covalent, metallic, and van der Waals bonds and note which materials exhibit each of these bonding types. They should be able to derive and compute the parameters (edge length of unit cell, APF, density,...) for FCC, BCC and HCP crystal structures. They should be able to know the diffusion process (diffusion mechanisms, mathematics, and factors affecting on it). The students should be able to name and describe the material defects (point, line, area) and how to improve these defects (i.e. strengthening mechanisms) in solids. They should be able to name and measure some mechanical, electrical, optical and magnetic properties of materials. In addition to, they should be able to define and test the fracture, fatigue, and creep in solids and the factors affecting them.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Basic information of atomic structure (A2)
- a2- Characteristics of engineering materials (ferrous and nonferrous) (A3).
- a3- Principles of material imperfections and strengthening mechanisms (A4)
- a4- Basic properties of materials; mechanical, electrical, optical and magnetic (A3).
- a5- Engineering design principles for material selection (A18).

b - Intellectual skills:

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

- b1- Investigate the material properties to choose the suitable material (B1, B13)
- b2- Select appropriate solutions for material problems based on analytical thinking (B2)
- b3- Assess and evaluate the characteristics and performance of materials (B5)
- b4- Use the principle of engineering science in selection of the required materials (B15, B17).

c - Professional and practical skills:

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

- c1- Solve some simple production problems related to material and process selection (C19)
- c2- Apply knowledge of materials to determine the suitable used material(s) (C1).
- c3- professionally merge the engineering knowledge to improve material properties (C2).

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A3, A4, A18
B	Intellectual skills	B1, B2, B5, B13, B15, B17
C	Professional and Practical Skills	C1, C2, C19
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Introduction	2	2	1
➤ Atomic structure	2	2	1
➤ Structure of crystalline materials.	2	2	1
➤ Imperfections in solids	2	2	1
➤ Diffusion in solid	2	2	1
➤ Strengthening mechanisms	2	2	1
➤ Mechanical properties of materials	6	6	3
➤ Electrical / Thermal properties of materials	2	2	2
➤ Optical / Magnetic properties of materials	2	2	1
➤ Fracture, Fatigue, and Creep of materials	4	4	2
Total hours	28	28	14

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Introduction to Engineering Material (Lecture Notes)

6-2 Required books : David G. Rethwisch, "Fundamentals of Materials Science and Engineering", Wiley, Asia, 2013

6-3 Recommended books: William D. Callister, "Fundamentals of Materials Science and Engineering", Wiley, USA, 2005

6-4 Periodicals, Web sites, etc.

http://simple.wikipedia.org/wiki/Materials_science

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

<http://www.homework-help-secrets.com/atomic-structure.html>

7- Facilities required for teaching and learning:

- Lecture Room
- Computer, Data show and Materials Lab.

Course coordinator:

Dr. Gamal Abdou

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specifications MNFN113: Mechanics of Machines – 1

A- Affiliation

Relevant program:	Mechanical Design and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering & Production Technology Department
Department offering the course:	Manufacturing Engineering & Production Technology Department
Date of specifications approval:	December 2018

B - Basic Course Contribution

Title: Mechanics of Machines-1	Code: MNFN113	level: sophomore 1, first semester
Credit Hours: 3	Lectures: 2	Tutorial: 3
	Practical: 0	Total Contact: 5
	Pre-requisite: MECN002	

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to calculate, design, analyze the motion of, different mechanical elements

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- System of particles; Newton's law of motion, linear and angular momentum, conservation of momentum, kinetic energy, (work and energy) and (impulse and momentum). (A1& A13).
- a2- Moment of inertia of different shapes (A1& A13).
- a3- Rigid bodies; translation, rotation, general plane of motion, absolute and relative velocity, absolute and relative acceleration and plane of motion of rigid body. (A1& A13).
- a4- Plane motion of rigid bodies; force & acceleration (A1& A13).
- a5- Plane motion of rigid bodies; Energy & momentum (A1& A13).
- a6- Cams; classification, profile, displacement, velocity and acceleration. (A1& A13).

b- Intellectual skills:

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

- b1- Investigate the motion of a system of particles (B1, B13)
- b2- Deduce mathematical relations describing the motion of a system of particles (B13)
- b3- Deduce mathematical relations describing the motion of a rigid body (B13)
- b4- Analyze the fate of motion of a mechanism (B13)

c - Professional and practical skills:

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

- C1- Calculate the motion of a system of particles (C1).
- C2- Calculate the motion of a rigid body using the principles of force and acceleration (C1).
- C3- Calculate the motion of a rigid body using the principles of work and energy (C1).
- C4- Calculate the motion of a rigid body using the principles of impulse and momentum (C1).
- c5- Design, of a cam (C1)

d - General and transferable skills:

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

- d1- Communicate with others; work in a team and involvement in group discussion and seminars (D3, D1).
- d2- Present data and results orally and in written form (D3, D9).
- d3- Search for information's in references and in internet (D7).
- d4- Practice self-learning (D7).

Course Contribution in Program ILO s

	ILO's	Program ILO's
a	Knowledge and understanding	A1 , A13
b	Professional and practical skill	B1 , B13
c	Intellectual skills	C1
d	General and transferable skills	D1, D3 , D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ System of particles			
• Linear and angular momentum of a system of particles	4	6	
• Motion of mass center of a system of particles	2	3	
• Angular momentum of a system of particles about its mass center	4	6	
• Conservation of momentum for a system of particles	1	3	
• Kinetic energy of a system of particles	1	3	
• Principles of work & energy for a system of particles	1	3	
• Principles of impulse & momentum for a system of particles	1	3	
➤ Moment of inertia	1	3	
➤ Kinematics of rigid bodies	4	3	
➤ Plane motion of rigid bodies: force & acceleration	4	3	
➤ Plane motion of rigid bodies: Energy & momentum	4	3	
➤ Cams	1	3	
Total hours	28	42	

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Quizzes (4 quizzes)	Every 3 Weeks	20
	Reports (Two)	4 th and 9 th weeks	
	Assignments (4 Sheets)		20
Mid-Term Exam		6-th Week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Mechanics of Machines 1

6-2 Required books

Ferdinand P. B. and Russell E. Johnston (2009) Vector Machines For Engineers-Dynamics. NY: McGraw-Hill, 9th Ed.

Khurmi R. S. and Gupta J. K., (2005) Theory of Machines. New Dehli 14th Ed.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.(At least 3 websites)

7- Facilities required for teaching and learning:

Lecturing and Exercise rooms

Course coordinator:

Dr. Rehab Ibrahim

Head of the Department:

Professor Nabil Gadallah

Date:

December 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN114: Machine Drawing I

A- Affiliation

Relevant program: Manufacturing Eng. and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: Machine Drawing I
Credit Hours: 3
Code: MNFN114 **Level:** Sophomore, First Semester
Lectures: 2 **Tutorial/Exercise:** 4 **Practical:**
Pre-requisite: MNFN002

C - Professional Information

1 – Course Learning Objectives:

A study of this course will enable the student to draw assembly drawing, have the knowledge about machine constructions have knowledge about the machine constructions documents.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

By the end of the course the student should know and understand:

- a1- The necessary data for production (drawing of detail drawing). [A2,A3 & A6]
- a2- Dismountable Joints used in assembly drawings). [A5,A6 & A18]
- a3- Permanent Joints used in assembly drawings. [A5, A6 & A18]
- a4- Construction of machines. [A3, A4, A6 & A18]
- a5- Design documents. [A5 & A6]

B - Intellectual skills

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

- b1- Make assembly drawings from detail drawings. [B3 & B4]
- b2-Determine the function of the assembled unit. [B3, B4 & B8]
- b3-Develop the sequence of assembling detail parts [B14]

C - Professional and practical skills

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

- c1- Create new construction based on his knowledge of Machine Drawing. [C3 & C14]
- c2- Read assembly drawing [C2].
- c3- Make detail drawing from assembly[C1 & C13] .
- C4- Choose the suitable standard joint [C1, C2 & C10]

D - General and transferable skills

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

- d1) Collaborate effectively within multidisciplinary team. [D1]
- d2) Work in stressful environment and within constraints. [D3]
- d3) Communicate graphically using the graphic language [D3].
- d4) Refer to relevant standard. [D9]

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A3, A4, A5, A6, A18
B	Intellectual skills	B3 ,B4, B8, B14
C	Professional and Practical Skills	C1, C2 ,C 3, C10,C13, C14
D	General and transferable skills	D1,D 3 & D 9

3 – Contents

Topic	Lecture hours	Tutorial hours
CHAPTER I: Data necessary for production		
1. Shape Description	2	4
2. Size Description	2	4
3. Tolerances & Fits and Geometrical Accuracy	4	6
4. Surface Finish	4	6
5. Material Description	2	4
CHAPTER II: Graphical representation of principal machine elements and joints		
1. Introduction	4	2
2. Standardization of Machine Parts		
3. Joints of Machine Parts		
4. Dismountable Joints		
4.1 Threaded Joints	2	6
4.2 Keyed Joints	2	8
4.3 Splines & Serrations		
4.4 Pin Joints	2	4
5. Non Dismountable Joints	2	6
5.1 Welded Joints		
5.2 Riveted Joints	2	6
Total hours	28	56

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Assignments	weekly	20 points
Mid-Term Exam	Eighth week	20 points
Quizzes	4- Quizzes	20 points
Written Exam	Sixteenth week	40 points
Total		100 points

6- List of References

- 6-1 Course notes Machine Drawing (1) by : Prof. Nabil Gadallah
- 6-2 Required books Engineering Drawing and Graphic Technology Mc-Graw Hill,2009
- 6-3 Recommended books
- 6-4 Periodicals, Web sites ... etc. Standardized parts

7- Facilities Required for Teaching and Learning

- OHP and screen
- Model wood, Al., steel, and foam prototypes as teaching aids

Course Coordinator: Dr. Tarek Ahmad Abdou
Head of the Department: Prof. Nabil Gadallah
Date: September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN115: Mechanics of Machines-2

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology
Department offering the course:	Manufacturing Engineering and Production Technology
Date of specifications approval:	September 2018

B - Basic Information

Title: Mechanics of Machines-2	Code: MNFN 115	Year/level: 1 st level / 2 nd semester
Credit Hours: 3	Lectures: 2	Tutorial: 3 Practical: -
	Prerequisite: MNFN113	

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand the basic concepts and notations of mechanisms, gears and gear trains, gyroscopes and gyroscopic effects, inertia forces and couples in machine parts, speed governors and flywheels. The student should be able to analyze the forces and couples acting on the moving parts and implement the necessary modifications to achieve the required performance of linkages and mechanisms as well as the controlling of rotating speeds of shafts.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Kinematics of motion of particles, the basic equations governing particles motions. Ways of plotting displacement, velocity, and acceleration time diagrams (A3, A13))
- a2- The sort of motions of members of any mechanism (rotating, translating, plain motions) (A3).
- a3- The methods needed to calculate and analyze the motion of any mechanism and its individual members (A1, A5)).
- a4- Sorts of gears and gear trains besides the fields of application of each (A3).
- a5- The methods used to calculate the transmission ratio, the power and torque transmitted in each type of gear trains (A1, A5).
- a6- Concepts of gyroscopes, the gyroscopic effect and their theoretical backgrounds (A1, A12).
- a7- Concepts of inertia, inertia forces and couples in machine parts as well as the fluctuations of energy and speed of rotating parts. (A1, A13)

b - Intellectual skills:

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

- b1- Analyze the motions of mechanisms and their links members. (B5, B14, B17)
- b2- Apply the principles of mathematics, science and technology to solve problems of gear trains, mechanisms, and machine moving parts. (B13).
- b3- Evaluate designs of mechanisms, gear trains, flywheels and propose improvements. (B15)
- b4- Select appropriate mathematical and computer-based methods for analyzing problems related to mechanisms, gear trains, and flywheels. (B1, B2).

c - Professional and practical skills:

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

- c1- Design, assemble, operate, inspect and maintain mechanisms, gear trains, and moving parts (C3, C6, C11, C18).
- c2- Apply knowledge of mathematics, science and engineering practice integrally to solve problems related to gears, mechanisms, and machine moving parts. (C1).
- c3- Use computer software to design, calculate, simulate or animate different mechanisms and moving parts (C5, C6).
- c4- Solve operational problems related to mechanisms and their members as well as gear trains (C1, C8, C11).

d - General and transferable skills:

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

d1- Search for information from diverse references and internet. (D3, D7, D8, D9)

d2- Write technical reports and perform the given arrangements. (D2, D6)

d3- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A3, A5, A12, A13
B	Professional and practical skills	B1, B2 B5, B13, B14, B15, B17
C	Intellectual skills	C1, C3, C5, C6, C8, C11, C18
D	General and transferable skills	D2, D3, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Kinematics of motion: Different types of motions of particles, the basic equations governing motion. Graphical representation of displacement, velocity, and acceleration versus time. Relation between linear angular quantities of motion.	2	4	
Velocity in Mechanism: Space and body centroid, Methods for determining the velocity of a point on a link, velocity of point on a link by instantaneous center method	4	8	
Gear trains: types of gear trains: simple, compound, reverted, and epicyclic gear trains. Transmission ratios of different gear trains	6	10	
Mid Term Exam	-	-	
Gyroscopes: Definition of gyroscope, precessional angular motion, gyroscopic couple, effect of gyroscopic couple in different applications (motor vehicles, marines, aircrafts, production machines,).	4	6	
Inertia forces in reciprocating parts: D'Alembert's principle velocity and acceleration of reciprocating parts in engines, approximate analytical method for velocity and acceleration of the piston and connecting rod, forces on the reciprocating parts of an engine	4	8	
Turning moment diagrams and flywheel. Turning moment diagrams for single-cylinder and multi-cylinder engines. Fluctuations of energy and speed, flywheel design calculations.	4	4	
Speed governors, mechanism of action of the basic types of governors and the basic equations for controlling the rotating speeds.	4	2	
Total hours	28	42	-

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	x	x	x	x	x		x					x				x		x	x	x		x
	a2	x	x	x																	x		x
	a3	x			x	x						x							x	x	x		x
	a4	x	x	x								x					x				x		x
	a5	x			x	x						x						x	x	x			x
	a6	x	x	x	x	x						x						x			x		x
	a7	x	x	x	x	x						x					x		x	x	x		x

Intellectual Skills	b1	x	x		x	x										x	x	x		x
	b2	x	x		x	x										x	x	x		x
	b3	x			x	x											x	x		x
	b4	x															x	x		x
Applied Prof. Skills	c1	x	x		x	x											x	x	x	x
	c2	x		x	x	x						x					x	x	x	x
	c3	x			x	x						x					x	x	x	x
	c4	x	x		x	x						x					x	x	x	x
General Tran. Skills	d1		x	x								x					x			
	d2	x	x	x	x	x						x					x			x
	d3		x		x	x						x					x			

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Class Work	Bi-Weekly	20
	Assignments	Every two weeks	10
	Quizzes	2 Times	10
Mid-Term Exam		7-th Week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

Lecture notes: Gaafar A.H. "Mechanics of Machines-II", Printed lectures, Modern Academy of Engineering and Technology.

6-2 Required books

Khurmi R.S. and Gupta J.K. "Theory of Machines", S. Chand & Company Ltd, 2000, ISBN 81-219-0132-4.

6-3 Recommended books: Non

6-4 Periodicals, Web sites:

http://www.codecogs.com/library/engineering/theory_of_machines/mechanisms.php

https://en.wikisource.org/wiki/The_Kinematics_of_Machinery

<https://www.google.com.eg/#q=websites+of+%22theory+of+machines%22&start=30>

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs.

Course coordinator:

Assoc. Prof. Gaafar Ahmed Hussein

Head of the Department:

Prof. Nabil Gadalla

Date:

December, 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN116: Machine Drawing (2)

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: Machine Drawing (2) **Code:** MNFN 116 **Year/level:** 1st Level / 2nd Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 4
Pre-requisite: MNFN114 **Total:** 6

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand how to draw an assembly drawing of a Machine or Mechanism then draw the detail working drawing of any needed part to be manufactured in Production Work Shop. Also, how to use documents and International Standard.

2 – Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1 - Kinds of Drawings. (A2&A6)
- a2 - Permanent of Joints used in assembly, (Welded and Riveted joints).(A5, A6& A19)
- a3 - Sliding and Rolling Bearings. (A5, A6& A18)
- a4 - Gear Transmission. (A5, A6& A18)
- a5 - Springs. (A5, A6& A18)

b - Intellectual skills:

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

- b1 - Use the International Standard Organization(B8).
- b2 - Read and understand the function of the assembly drawing. (B3,B4& B8)
- b3 - Know the function of each part of the assembly. (B17)

c - Professional and practical skills:

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

- c1 - Draw the detail working drawing of each part in the assembly(C1&C13)
- c2 - Choose the suitable standardized parts(C1C2&C10).
- c3 - Develop in the construction of the assembly drawing. (C14)
- c4 - Do the assembly and disassembly. (C2)

d - General and transferable skills:

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

- d1 - Work under severe conditions. (D1)
- d2 - Work individuals. (D5)
- d3 - Refer to relevant standard. (Independent work). (D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A5, A6, A18, A19.
B	Intellectual skills	B3, B4, B17, B8
C	Professional and Practical Skills	C1, C2, C10, C13, C14.
D	General and transferable skills	D1, D5, D9

3. Content

No	Topic	Lecture hours	Tutorial hours
1	CHAPTER 1: BEARINGS 1. Classification of bearings 2. Advantages of plain bearings 3. Advantages of rolling-contact bearings 4. Types of bearing loadings	2	4
2	CHAPTER 2: Sliding Bearings A- Radial Sliding Bearing (Journal bearings) B- Thrust Sliding Bearing C- Combined Loaded Sliding Bearing	4	8
3	CHAPTER 3: Rolling Bearings A- Radial Rolling Bearing (Ball bearings) B- Thrust Rolling Bearing C- Combined Loaded Rolling Bearing D- Mounting of Rolling Bearings	4	8
4	CHAPTER 4: POWER TRANSMISSION 1. General: Direct (in contact) drives Indirect drives 2. General kinematics 3. Efficiency of power Transmission	2	4
Mid Term (L:2hrs & Tutorial: 4hrs)			
5	CHAPTER 5: Gear Drive 1. Spur gears 2. Helical gears. 3. Bevel gears 4. Worm gears	4 2 2 2	8 4 4 4
6	CHAPTER 6: GEAR REDUCERS 1. Gear Reducers Fundamentals 2. Single Stage Spur Gear Reducer 3. Single Stage Worm Gear Reducer	2	4
8	CHAPTER 7: SPRINGS 1. Kind of Springs 2. Applications	2	4
Total hours		28	56

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method					
		Lecture	Presentations & Movies	Discussions	Tutorials	Problem solving	Brain storming				Modeling	Self-learning		Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1		1	1	1									1		1	1	
	a2	1		1	1	1									1		1	1	
	a3	1		1	1	1									1		1	1	
	a4	1		1	1	1									1		1	1	
	a5	1		1	1	1									1		1	1	
Intellectual Skills	b1	1		1	1	1									1		1	1	
	b2	1		1	1	1									1		1	1	
	b3	1		1	1	1									1		1	1	
Applied Prof.	c1	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		
General Tran. Skills	d1			1	1								1								
	d2			1	1								1								
	d3				1								1								

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Class Work	Bi-Weekly	20
	Assignments (H.W)	Bi-Weekly	10
	Quizzes	2 Times at 5 th and 10 th Weeks	10
Mid-Term Exam		7-th Week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Machine and Construction Drawing, Printed lecture Modern Academy..

6-2 Required books

- W. ABOTT, Technical Drawing, Fourth edition, Printed in Great Britain, 1976, ISBN 0216 90210x (Blackie edition).
- K.L.Narayana, P.Kannaiah, K.Venkata Reddy, Production Drawing, second edition, New AGE, International Publishers, 2009, ISBN 978-81-224-2288-7
- James H-Earle, Graphics For Engineers, Printed in Adison-Wesley Publishing Company, 2001, ISBN 0-201-11430-5

6-3 Recommended books: Non

Course coordinator: Assist. Prof. Dr. Ahmed EL Sanabary
Head of the Department: Prof. Nabil Gadallah
Date: September 2018



Course Specification
MNFN121: Metal Cutting Processes

A- Affiliation

Relevant program:	Manufacturing Engineering & Production Technology Prog.
Department offering the program:	Manufacturing Engineering & Prod. Tech. Department
Department offering the course:	Manufacturing Engineering & Prod. Tech. Department
Date of specifications approval:	12 / 2018

B - BASIC INFORMATION

Title: Metal Cutting Processes	Code: MNFN121	Year/level: 1 st Level
Credit Hours: 3	Lectures: 2	Tutorial: 1 Lab/Practical: 2
	Total: 3	Pre-requisite: MNFN003

C - PROFESSIONAL INFORMATION

1 – COURSE LEARNING OBJECTIVES:

At the end of the course the students should demonstrate knowledge and understanding of the principles of different metal cutting processes, selection of cutting tool and process sheet.

2 - INTENDED LEARNING OUTCOMES (ILOs)

A - Knowledge and understanding:

On successful completion of the course the students should demonstrate knowledge and understanding of.

- a1- Characteristics of solid materials related to the metal cutting processes (A3).
- a2- Current classical production technologies as related to the production processes (A8).
- a3- Experimental determination of cutting parameters (energy, force, stress and strains) (A13).
- a4- Writing technical report required when solving production problems (A10).
- a5- Comparison of theoretical and practical metals cutting conditions (A12).

B- Intellectual Skills

On successful completion of the course the students should be able to:

- b1- Think in a creative and innovative way in determining the suitable cutting process (B3).
- b2- Apply knowledge from different sources to cutting process (B8).
- b3- Investigate the relation between theoretical and practical results of cutting process (B12).
- b4- Evaluate and appraise the cutting processes to a certain product (B16).

C- Professional and Practical Skills

On successful completion of the course the students should be able to:

- c1- Use different types of tools, techniques and equipment pertaining to the production process (C8).
- c2- Design an experimental system for measuring the metal cutting process parameters and compare with the theoretical ones (C8).
- c3- Use measuring instruments, workshop facilities, and processing equipment to design experiments for analyzing, collect, analyze, and interpret results of experiments (C5).
- c4- Use a wide range of tools, techniques, equipment, and processing to the metal cutting theories and develop computer programs(C6).
- c5- Apply safe systems when dealing with different technologies (C8).
- c6- Prepare and present technical reports required when solving problems and executing experiments (C12).

D - General and transferable skills:

On successful completion of the course the students should be able to:

- d1- Work in a team and involve in group discussion (D1, D3).
- d2- Collaborate effectively within multidisciplinary team. (D4)
- d3- Present findings in simple and illustrative way.(5)

3-Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction; Definition of technology, production system, manufacturing processes and elements of machining system	4	4	
Machining Deviations; reasons, types, dimensional deviation and ISO system of tolerances, definitions and denotations of geometric deviations, standardization and measurement of surface roughness.	4	4	2
Classification of metal cutting processes.	1		1
Turning process.	4	4	2
Measurement and inspections	4	4	2
Drilling and boring processes.	4	4	1
Planning, shaping, and slotting processes.	1	2	2
Milling process.	4	4	2
Surface and cylindrical grinding processes.	4	4	3
Note: At each metal cutting operations the following topics are going to be discussed; basic concepts, cutting tools and work pieces clamping methods, machine tool types and main parts, attainable accuracies and surface roughness, and sequences of operations required for specific applications for each metal cutting processes.			
Total	30	30	15

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Lecture	Presentations and Movies	Discussions	Tutorials	Problem solving	Brain storming	Projects	Self-learning	Modeling	Laboratory Work
Knowledge & Understanding	X			X						X
Intellectual Skills	X			X	X					X
Professional Skills	X			X	X					X
General Skills	X									

5- Students' Assessment Methods:

Tools	To measure the content of	Time schedule	Grading
Problems	b1to b3 and c1 to c4	3 rd , 5 th , 7 th , and 9 th weeks	20
Assignments	a1 to a4, b1 to b3, c1 to c4 and d1 to d3	2 nd , 8 th , and 12 th weeks	20
Mid-term exam	a1 to a3, b1 to be and c1 to c3	7 th week	20
Final exam	a1 to a4, b1 to b3, c1 to c4 and d1 to d3	16 th week	40
Total			100

6- List of references:

6-1 Course notes: Lecture notes and ISO standard tables

6-2 Essential books, Metal cutting processes, Lecture and exercise parts, by M. Merdan, Ph., D.

6-3 Recommended books;

Donald Brian Richardson Production Engineering Technology Palgrave Macmillan, 3rd edition, 1980

6-4 Periodicals, Web sites, etc. None

7- Facilities required for teaching and learning:

Lecture Rooms, Metrology Lab., and Workshops.

Course coordinator:	Dr. M. Merdan
Head of the Department:	Prof. Nabil gad Allah
Date:	2 / 2019



Modern Academy for Engineering and Technology in Maadi

Course Specification MNFN122 Materials Technology and Testing

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Materials Technology and Testing	Code MNFN122	Level: Sophomore, Second Semester
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:1 Practical: 2
	Pre-requisite: MNFN111, MNFN112	

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of alloys; construct a simple isomorphous and eutectic phase diagrams. For a binary phase diagram, they should be able to locate the temperatures and compositions of all eutectic, eutectoid, peritectic, and congruent phase transformations. The students should be able to construct the iron-carbon diagram, develop TTT and CCT diagrams. They also should be able to measure some mechanical properties under tensile, bending and fatigue loads.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Alloys and Alloying systems (A2)
- a2- Phase Equilibrium Diagrams and TTT and CCT Diagrams (A3).
- a3- Fe/Fe₃C iron carbon diagram (A4)
- a4- The heat Treatment of Metals (A3).
- a5- Mechanical properties of materials (A18).

b - Intellectual skills:

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

- b1- Investigate the concept of alloying and its effect on the properties of metals (B1, B13, B19)
- b2- Construct a simple isomorphous and eutectic phase diagrams (B2)
- b3- Develop TTT and CCT diagrams (B5)
- b4- Determine the mechanical properties under different loads (tensile, bending, impact, fatigue) (B15, B17).

c - Professional and practical skills:

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

- c1- Construct some simple phase diagrams and label the various phase regions (C19)
- c2- Measure some mechanical properties under tensile, bending, impact and fatigue loads (C1).
- c3- Professionally merge the engineering knowledge to improve material properties (C2).

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's\

ILO's		Program ILO's
A	Knowledge and understanding	A2, A3, A4, A18
B	Intellectual skills	B1, B2, B5, B13, B15, B17, B19
C	Professional and Practical Skills	C1, C2, C19
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Practical hours	Tutorial hours
➤ Alloys and Alloying systems	3	3	1
➤ Phase Equilibrium and Phase Diagrams	4	3	2
➤ Fe/Fe ₃ c iron carbon diagram	4	3	2
➤ phase Transformation	3	3	1
➤ Time Temperature Transformation (TTT) diagrams	4	4	3
➤ Continuous Cooling Transformation (CCT) diagrams	3	3	2
➤ The heat Treatment of Metals	3	3	1
➤ Mechanical properties of materials	2	4	1
➤ Fracture, Fatigue and Creep	2	2	1
Total hours	28	28	14

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Materials Technology and Testing (Lecture - Lab. Notes)

6-2 Required books : David G. Rethwisch, "Fundamentals of Materials science and Engineering", Wiley, Asia, 2013

6-3 Recommended books: William D. Callister, "Fundamentals of Materials Science and Engineering", Wiley, USA, 2005

6-4 Periodicals, Web sites, etc.

http://simple.wikipedia.org/wiki/Materials_science

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

<http://www.homework-help-secrets.com/atomic-structure.html>

7- Facilities required for teaching and learning:

- Lecture Room
- Computer, Data show and Materials Lab.

Course coordinator:

Dr. Gamal Abdou

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN160: Summer training for level one

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Mechanical Engineering Department
Department offering the course: Mechanical Engineering Department
Date of specifications approval: November, 2018

B - Basic Information

Title: Summer training for level zero
Credit Hours: 0

Code: MNFN160 **Year/level:** Level zero
Lectures: - **Tutorial/Exercise:** total of 60 hours
Practical: - **Total:** 60 hours
Pre-requisite: MNFN060

C - Professional Information

1 – Course Learning Objectives:

By the end of this training the students should demonstrate the knowledge and understanding of the use of the Solid Works package (The essential level).

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Basic features and commands of SolidWorks package (Extrude and extrude out) (A1, A2, A10)

a2- Revolve and revolve out. (A4).

a3- Sweep and Lofting) (A4)

- a4- Curves, holes and hole wizard (A4).
- a5- Assembly constraints, features and animation. (A14)
- a6- Drafting (Change from model to drawing, making detailed drawing, and changing from a drawing to isometric. (A10, A18)
- a7- Simulation express- Photo View 360 and Evaluation. (A10, A18)

b - Intellectual skills:

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

- b1-Use of feature and commands (B2, B8)
- b2- Ability to make assembly drawing, and use right constraints (B3, B8)
- b3- create a detailed drawing and isometric (B17)
- b4- simulate photo and view 360 (B10, B2)

c - Professional and practical skills:

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

- c1- Create drawings detailed drawing and isometric using SolidWorks. (C1, C3, C17)
- c2- Animate an assembly (C4, C13, C17).

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A2,A4, A10, A14, A18.
B	Professional and practical skills	B2,B3,B8, B10,B17.
C	Intellectual skills	C1, C3, C4, C13, C17.
D	General and transferable skills	D1,D3,D7,D9.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ What is SolidWorks? Using Interface, Introduction		2	4
➤ Features & Commands- (Using sketches to make a model) Extrude and extrude cut.		2	4
➤ Features & Commands- (Revolve and revolve cut).		2	4
➤ Features & Commands- (Sweep & Lofting). Introduction to curves.		2	4
➤ Holes and hole wizard.		2	4
➤ Assemblies. Assembly Constraints. Using matting.		2	4
➤ Assemblies and tool box: Assembly features, Introduction to animation		2	4
➤ Drafting, Change from model to drawing., Making a detailed drawing.		2	4
➤ Changing from a drawing to isometric			
➤ Continue drafting: Simulation Express- Photo View360 (Introduction). & Evaluation		4	8
Total hours		20	40

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method						
		Lecture	Presentations & Videos	Discussions & Case Studies	Tutorials	Problem solving	Group work	Self-learning	Guest Lectures	Modeling	Self-learning	Guest Lectures	Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam				
Knowledge & Understanding	a1	x	x	x												x	x	x	x	x		
	a2	x	x	x						x						x	x	x	x	x		
	a3	x	x	x						x						x	x	x	x	x		
	a4	x	x	x						x						x	x	x	x	x		
	a5	x	x	x						x						x	x		x	x		
	a6	x	x	x						x						x	x		x	x		
	a7	x	x	x						x						x	x		x	x		
Intellectual Skills	b1	x	x	x												x	x	x	x	x		
	b2	x	x	x						x						x	x	x	x	x		
	b3	x	x	x												x	x	x	x	x		
	b4	x	x	x												x	x			x		
Applied	c1	x		x														x	x	x		
	c2	x	x															x	x	x		
General Tran. Skills	d1		x	x																		
	d2			x												x						
	d3																x					
	d4										x								x			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
quizzes and assignments	Daily	60
Final Evaluation	Tenth Day	40
Total		100

6- List of references:

6-1 Course notes: AutoCAD package

6-2 Required books: None

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.:

7- Facilities required for teaching and learning:

- Computer lab , Computers and data show

Course coordinator: Prof. Dr. Nabil Gadalla
Head of the Department: Prof. Dr.. Nabil Gad Alla
Date: November, 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN211: Fluid Mechanics

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Eng. and Production Tech. Department
Department offering the course:	Manufacturing Eng. and Production Tech. Department
Date of specifications approval:	September 2018

B - BASIC INFORMATION

Title: Fluid Mechanics	Code: MNFN211	Year/level: Junior, first semester
Credit Hours: 3	Lectures: 2	Tutorial:1 Practical: 2
	Pre-requisite: MTH102	

C - Professional Information

1 – Course Learning Objectives:

By the end of the course, students should know what is meant by fluid substances, fluid properties and their effect on fluid behavior, pressure at a point in a fluid, pressure measurement, and hydrostatic forces acting on plane or curved surfaces. Gain better understanding of fluid kinematics (velocity and acceleration fields), physical laws and some of their applications. In addition to use of similitude and dimensional analysis for better model design. All the above will be applied on viscous flow in pipes. The student will perform some experiments concerning fluid and flow characteristics.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Systems of units, dimensional homogeneity and basic concepts and definitions used in fluid mechanics (A1, A2, A13)
- a2- The effects of fluid properties on fluid behavior (A3, A13, A18)
- a3- Methodology of analysis of fluid static and dynamic problems (A1, A5)
- a4- Buoyancy and its effect on stability and floatation of bodies (A1, A4, A13, A14, A18)
- a5- What is meant by streamlines, path lines, and streak lines (A1, A13)
- a6- Conservation laws (mass, momentum, energy), and their applications (A1, A4, A13)
- a7- Concept of dimensional analysis, similitude, design of models, and planning of experiments required to test the model (A1, A5, A19)
- a8- How to analyze the behavior of viscous fluids in pipes and ducts (A1, A5, A14)

b - Intellectual skills:

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

- b1- Use different systems of units (B17)
- b2- Solve simple problems concerning fluid statics and fluid dynamics for laminar flow of viscous/inviscid fluids (B2, B7)
- b3- Calculate forces affecting the fully and partially immersed bodies and study of stability of ships, submarines ...etc (B13, B17)
- b4- Apply physical laws (mass, momentum, energy conservation laws in addition to ideal gas law) on fluid flow problems (B13, B17)
- b5- Use the concept of dimensional analysis, similitude, and modeling to design simple prototypes that helps in the fluid problem analysis (B1, B13, B17)

c - Professional and practical skills:

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

- c1- Integrate knowledge from different courses to solve a fluid problem (C2)
- c2- Design, plan, and perform experiments to study fluid problems (C3)
- c3- Use experimental facilities and related computer software to investigate and analyze some phenomena related to fluid mechanics (C17)
- c4- Carry out some experiments concerning hydrostatic force acting on a plane surfaces, hydraulic losses in bends, Bernoulli's equation, flow over weirs, Reynolds's experiment, and free jet flow (C5)
- c5- Analyze experimental results and determine their accuracy and validity (C12, C16)

d - General and transferable skills:

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

- d1- Work in a team and be involved in a group discussion (D1)
- d2- Work in a stressful environment and within constraints (D2)
- d3- Lead and motivate individuals (D5)
- d4- Present the results and conclusions of his work orally or in a written form (D3)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5, A13, A14, A18, A19
B	Intellectual skills	B1, B2, B7, B13, B17
C	Professional and Practical Skills	C2, C3, C5, C12, C16, C17
D	General and transferable skills	D1, D2, D3, D5

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction: definition of fluids, dimensions and units, fluid properties.	3	2	3
• Fluid statics: pressure at a point, pressure field, pressure measurement, hydrostatic forces acting on plane and curved surfaces, buoyancy, floatation, and stability.	6	2	6
• Fluid kinematics: velocity field, acceleration field, Reynolds's transport theorem.	6	2	6
• Conservation laws: conservation of mass- continuity equation, conservation of linear and angular momentum, conservation of energy	5	2	5
• Similitude, dimensional analysis, and modeling: dimensional analysis, Buckingham Pi theorem, determination of Pi terms by inspection, Common dimensionless groups in fluid mechanics, correlation of experimental data, modeling and similitude, some typical model studies.	6	4	6
• Viscous Flow in Pipes: general characteristics of pipe flow, fully developed laminar flow, fully developed turbulent flow, dimensional analysis of pipe flow, pipe flow examples, pipe flow rate measurement.	4	3	4
Total hours	30	15	30

4 - Teaching and Learning and Assessment methods:

		Teaching Methods										Learning Methods				Assessment Method						
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Assignments	Quizzes	Reports	Mid-Term	Practical Exam
Knowledge & Understanding	a1	1			1	1						1					1	1		1		1
	a2	1	1		1	1						1					1	1	1	1		1
	a3	1			1	1						1					1	1		1		1
	a4	1			1	1						1					1	1		1		1
	a5	1	1		1	1						1					1	1		1		1
	a6	1			1	1					1	1					1	1		1		1
	a7	1			1	1					1						1	1		1		1
	a8	1	1		1	1						1					1	1		1		1
Intellectual Skills	b1	1			1	1						1					1	1		1		1
	b2	1			1	1					1	1					1	1	1	1		1
	b3	1			1	1						1					1	1		1		1
	b4	1			1	1						1					1	1		1		1
	b5	1			1	1						1					1	1		1		1

Applied Prof. Skills	c1	1	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	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	
General Tran. Skills	d1		1	1		1						1						1		1	
	d2	1	1	1	1	1						1				1	1	1	1	1	1
	d3		1		1	1						1						1		1	
	d4		1	1								1				1	1	1	1	1	1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work:, Assignments, Quizzes & Reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Selected topics

6-2 Required books

Fundamentals of Fluid Mechanics, B.R. Munson, D.F. Young, & T.H., Okiishi, John Wiley & Sons, Inc., 7th. ed., 2013.

6-3 Recommended books:

Fluid Mechanics, F.M. White, McGraw-Hill, 4th ed., 1999.

6-4 Periodicals, Web sites, etc.

Web sites interested in fluid mechanics

7- Facilities required for teaching and learning:

- Fluid Mechanics laboratory.
- Library

Course coordinator:

Dr. Abdelmagid A. Abdalla

Head of the Department:

Prof. Nabil Gadalla

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN212: Computer Applications I

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: : Computer Applications I
Credit Hours:

Code: MNFN212	Year/level: Junior- 1 st semester
Lectures: 2	Tutorial:- Practical: 2
Pre-requisite: MNFN111	

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:

- Recognize the need of using computers as a tool in the engineering problem solving approach.
- Understand different aspects of computer applications in mechanical engineering.
- Learn the basics of computer aided graphics and drafting.
- Use specialize computer packages in engineering graphics and analysis.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1-Undersatand the role of computer applications in mechanical engineering. (A2, A3, A4)
- a2-Understand the basic steps to use computer packages (such as Pro/Engineer, Solid Works) in solid modeling of parts, assemblies and in detail drawings. (A6, A10)
- a3-Understand the numerical symbolic and programming capabilities of available mathematical software (such as MATLAB) in engineering analysis. (A13, A18)

B - Intellectual skills

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

- b1- Choose the appropriate solid modeling approach and steps in part design and assemblies as well as in the preparation of detail drawings (B3, B4)
- b2- Formulate mechanical engineering problems in a problem solving approach using mathematical computer codes. (B8, B17)

C - Professional and practical skills

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

- c1- Use specialized solid modeling package in part design and assembly of different mechanical components as well as in detail drawings.(C1, C2, C3)
- C2-Devolp simple and effective computer programs to solve mechanical engineering problems using available mathematical computer packages. (C10, C14, C22)

D - General and transferable skills

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

- d1- Recognize the importance of using computers and available software in mechanical engineering in cooperation with other to share, import and export technical data. (D1)
- d2- Apply the acquired knowledge of computer graphics and engineering analysis in different engineering applications. (D3)
- d3 – View the general scope of available computer packages that can be used in mechanical engineering. (D9)

Course Contribution in the Program ILO's

Intended Learning Outcomes (ILOS)	Program ILO's
Knowledge and understanding	A2, A 3, A 4, A6, A10, A13, A18
Intellectual skills	B3, B 4, B 8, B 17
Professional and practical skills	C1, C2, C3, C10, C14, C22
General and transferable skills	D1, D3, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Introduction to Computer Applications for Mechanical Engineering	2		2
➤ Introduction to : Computer Graphics (Pro/Engineer)	2		2
• Solid modeling techniques in art design	2		2
• Extrusion and revolve	2		2
• Applications	2		2
• Sweep and blend	2		2
• Assemblies	2		2
• Detail drawing (Drafting)	2		2
➤ Introduction to MATLAB			
• Engineering analysis	3		3
• Introduction and basic vector and matrix	4		4
• Polynomials and solution of linear systems	2		2
• Programming and applications	3		3
Total hours	28		28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods									Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions	Tutorials	Problem Solving	Site visits	Projects				Modeling & Simulation	Self-learning	Cooperative	Researches	Seminars	Quizzes	Reports	Mid-Term	Practical	Written Exam	
Knowledge & Understanding	a1	1		1	1						1			1		1	1			1		
	a2	1		1	1						1			1		1	1			1		
	a3	1		1	1						1			1		1	1			1		
Intellectual Skills	b1	1	1	1	1		1	1			1			1			1			1		
	b2	1	1	1	1		1	1			1			1			1			1		
Applied Professional Skills	c1	1		1	1	1		1			1			1		1	1	1		1		
	c2	1		1	1	1		1			1			1		1	1	1		1		
General Tran. Skills	d1	1		1	1	1		1			1	1	1			1	1	1		1		
	d2	1		1	1	1		1			1	1	1			1	1	1		1		
	d3	1		1	1	1		1			1	1	1			1	1	1		1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Quizzes & Reports	Weekly	20
Mid-Term Exam	6 th . Week	20
Practical Exam	15 th . week	20
Written Exam	16 th . week	40
Total		100

6- List of references:

6-1 Course notes

N. Gadallah, Lecture notes of Computer Applications for Mechanical Engineers, Modern Academy, 2008

6-2 Required books

Software manuals

6-4 Recommended books:

An Engineer's Guide to MATLAB By Edward B. Magrab et al. Pearson, Prentice Hall

6-4 Periodicals, Web sites, etc.:

7- Facilities required for teaching and learning:

- Computer lab. Equipped with suitable computers and software packages.
- Data show

Course coordinator:

Prof. Dr. Nabil Gadallah

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN213 Computer Application -2

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: December 2018

B - Basic Information

Title: Computer Application -2 **Code:** MNFN213 **Level:** Level 2, Second Semester
Credit Hours: 2 **Lectures:** -- **Tutorial/Exercise:** 6 **Practical:** --
Pre-requisite: MNFN212

C - Professional Information

1 – Course Learning Objectives:

A study of this course will enable the student to:

- Understand the difference between CN and CNC machines.
- Know the different types of G-Codes
- Write program in G-Code (Fanuc)
- Implement some command in Turning and in Milling

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- The definition of the NC and CNC machine (A1, A8, A13, A16, A22)
- a2- The different types of the G-code. (A5, A6, A8, A15, A18)
- a3- The G-code (Fanuc). (A6)
- a4- The G-code for milling operations. (A6)
- a5- The G-code for turning operations. (A6)

b - Intellectual skills:

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

- b1- Define and describe the CNC machine. (B18)
- b2- Write a program in G-code (fanuc). (B7, B13)
- b3- Implement a simulation in milling and turning operations. (B13, B22)

c - Professional and practical skills:

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

- c1- Adjust the CNC machine for the zero point. (C1, C2, C14)
- c2- Clamp the semi-product on the CNC machine. (C8, C10, C14, C15)
- c3- Enter the written program of the G-code on the CNC machine. (C5, C14, C21, C22)

d - General and transferable skills:

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

- d1- Working in a team work (D1)
- d2- Demonstrate efficient IT capabilities. (D4)

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A1, A5, A6, A8, A13, A15, A16, A18, A22
B Intellectual skills	B7, B13, B18 , B22
C Professional and Practical Skills	C1, C2, C5, C8, C10, C14, C15, C17, C21, C22
D General and transferable skills	D1, D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to NC and CNC Machines	1		1
Basic Definitions of G-Codes	1		1
Different Types of G-Codes	2		3
Basic Terminology of G-Code (FUNOC)	1		3
Milling:			
– Work piece Installation	2		3
– Determination of Zero Position	2		3
– Definition and Applications of G58 , G52	2		3
– Definition and Applications of G00	2		3
– Definition and Applications of G01	2		3
– Definition and Applications of G02 , G03	3		4
Turning:			
– Definition and Applications of G58 , G52	2		3
– Definition and Applications of G00	2		3
– Definition and Applications of G01	2		3
– Definition and Applications of G02 , G03	2		3
Revisions	2		3
Total hours	28		42

4 - Teaching and Learning and Assessment methods:

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

- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work (Quizzes	4 Quizzes(every 3 weeks)2 degree for each one	8
	Reports	One report per semester	4
	Assignment	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of References

6-1 Course notes

Lecture notes

6-2 Essential books (text books)

Software manuals.

6-3 Recommended books

James V. Valentino, Ed V. Goldenberg and AAA Predator, 2012, Introduction to Computer Numerical Control, 5th Edition.

6-4 Periodicals, Web sites, etc.

None

7- Facilities Required for Teaching and Learning

- Computer lab. equipped with suitable computers and packages
- Lecture room
- Data show

Course Coordinator:

Dr. Eatemad Hosny

Head of the Department:

Prof. Dr. Nabil Gadalla

Date:

December 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN214: Thermodynamics

A- Affiliation

Relevant program:	Manufacturing Eng. and Production Technology BSc Program
Department offering the program:	Manufacturing Eng. and Production Technology Dept.
Department offering the course:	Manufacturing Eng. and Technology Production Dept.
Date of specifications approval:	September 2018

B - Basic Information

Title: Thermodynamics	Code: MNFN214	Year/level: Junior, 2 nd Semester
Credit Hours:	Lectures: 2	Tutorial:1
	Practical: 2	Total: 3
		Pre-requisite: PHY102

C - Professional Information

1 – Course Learning Objectives:

By the end of this course, the student should be acquainted with wide applications of thermodynamics, types of systems, energy, work and heat. Understand thermodynamic equilibrium, state, process, and cycle. Understand properties of pure substances, phase diagrams, and use of tables to determine the state of a system. Get acquainted with thermodynamics laws in different forms for control mass & control volume, enthalpy and entropy. Analysis of SSSF and USUF processes. Concept of heat engine and heat pump. Analysis of Carnot cycle, reversible and irreversible processes. Performing some experiments concerning heat and energy.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Thermodynamic system, and its surroundings (A1, A13)
- a2- Energy and its different forms (A1, A13)
- a3- Phase changes of a pure substances, and use of tables to determine their properties (A1, A5, A13).
- a4- Basic laws governing thermodynamic processes (zeroth, first, and second laws) (A4, A5, A8, A13, A18).
- a5- Thermodynamic temperature scale (A1, A12)
- a6- Enthalpy, entropy, and analysis of heat engines and heat pumps (A1, A2, A5, A8, A18)
- a7- Carnot cycle, its importance, and its efficiency (A3, A4, A18)
- a8- Methodology of solving thermodynamics problems (A5)
- a9- Engineering design principles and techniques (A18)

b - Intellectual skills:

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

- b1- Analyze different types of thermodynamic systems and describe their behavior (B1, B2)
- b2- Design a process, or system applying appropriate knowledge and principles (B13, B17)
- b3- Adopt creative and innovative thinking in solving thermodynamic problems (B17)
- b4- Determine the properties of different phases of a pure substance (B5)
- b5- Analyze simple thermodynamic problems using basic laws (B1, B2)
- b6- Solve problems related to entropy, Carnot cycle, heat pump, and heat engine (B2, B3, B17)

c - Professional and practical skills:

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

- c1-Employ laboratory facilities to design experiments and collect, analyze, and interpret results (C12, C16, C17)
- c2-Plan and execute some experiments concerning heat and energy (C5, C19)
- c3- Merge physical laws in addition to knowledge from other courses to solve problems concerned with heat and energy (C1, C2)
- c4-Analyze experimental results and determine their accuracy and validity(C16)
- c5- Gain additional knowledge concerning energy and its forms (C11)

d - General and transferable skills:

- On successful completion of the course, the student should be able to:
- d1- Apply knowledge from different resources to solve a problem (D7)
 - d2- Design and perform experiments concerning heat and energy (D8)
 - d3- Work in a team and be involved in a group discussion (D1)
 - d4- Present results & conclusions of work orally or in a written form (D3, D8)

Course Contribution in the Program ILO's

ILO's	ILO's	ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5, A8, A12, A13, A18
B	Intellectual skills	B1, B2, B3, B5, B13, B17
C	Professional and Practical Skills	C1, C2, C5, C11, C12, C16, C17, C19
D	General and transferable skills	D1, D3, D7, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction: Importance of thermodynamics, some applications. Mechanisms of heat transfer.	2	4	2
• Concepts and definitions: System, boundary, surroundings. Closed, open, and isolated systems. Kinetic, potential, and internal energy. State of a system, process, cycle, reversible, and irreversible processes, and work.	6	5	4
• Properties of a pure substance: Definition, phase diagram of water (p-v), (T-v), Tables of steam. Equation of state, and compressibility factor, specific heats (C_p & C_v).	6	5	4
• First law of thermodynamics: Statement of the first law for cycle & process. Different forms for a control mass & control volume. Special cases (SSSF, USUF). Enthalpy	6	5	4
• Second law of thermodynamics: Heat engine and heat pump, Kelvin–Planck and Clausius statements. Reversibility and factors affecting it, Carnot cycle and its efficiency, Thermodynamic temperature scales.	5	3	3
• Entropy: Definition, Clausius inequality, entropy of a pure substance, entropy change in a process, entropy relation, entropy generation and principle of increase of it, entropy change of a solid, liquid, and ideal gas. Second law for a control volume, for SSSF, and USUF processes,	5	3	3
Total hours	30	25	20

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods									Learning Methods							Assessment Method					
		Lecture	Presentations & Discussions	Tutorials	Problem solving	Laboratory Experiments	Brain Storming	Projects	Sketches	Site Vision	Modeling & Self-learning	Research and Cooperative						Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1		1								1									1		1
	a2	1		1								1									1		1
	a3	1		1	1							1									1		1
	a4	1		1	1							1						1			1		
	a5	1		1	1							1						1	1		1		1
	a6	1		1	1							1						1	1		1		1
	a7	1		1	1							1						1	1		1		1
	a8	1		1	1							1						1	1		1		1
	a9	1		1	1							1						1	1		1		1
Intellectual Skills	b1	1		1	1						1	1						1	1		1		1
	b2	1		1	1			1			1	1	1					1					
	b3	1		1	1		1	1			1	1	1					1					

	b4	1			1	1					1	1					1	1	1		1
	b5	1			1	1					1	1					1	1	1		1
	b6	1			1	1					1	1					1	1	1		1
Applied Prof. Skills	c1						1				1				1					1	
	c2						1				1	1								1	
	c3	1	1		1	1	1				1	1	1			1					
	c4						1				1	1								1	
	c5	1			1	1	1				1		1	1					1		
General Tran. Skills	d1	1		1	1	1					1	1	1			1	1	1	1	1	1
	d2		1				1				1	1	1		1					1	
	d3		1	1			1	1	1				1	1		1		1			
	d4		1			1	1					1	1			1		1		1	1

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Lecture notes, Lab. Notes, and handouts for assigned problems.

6-2 Required books

Fundamentals of Engineering Thermodynamics, 7th edition, by M.J. Moran and H.N. Shapiro, John Wiley & Sons, 2010

6-3 Recommended books:

- Thermodynamics: An Engineering Approach, 3rd edition, by Y.A Cengel and M.A.Boyes, WCB McGraw-Hill, 1998.
- Thermodynamics, 4th edition, by J.P. Holman, McGraw-Hill, 1998.

6-4 Periodicals, Web sites, etc.

- Available web sites concerned with thermodynamics courses and experiments

7- Facilities required for teaching and learning:

- Laboratories
- Modern academy library
- Lecture rooms and classes.

Course coordinator:

Dr. Abdelmagid A. Abdalla

Head of the Department:

Prof. Nabil Gadalla

Date:

September 2018

Course Specification MNFN221: Metal Cutting Processes

A- Affiliation

Relevant program:	Manufacturing Engineering and Prod. Tech. BSc. Program
Department offering the program:	Mechanical Engineering Department
Department offering the course:	Mechanical Engineering Department
Date of specifications approval:	12 / 2018

B - BASIC INFORMATION

Title: Metal Cutting Processes	Code: MNFN221	Year/level: 2 nd Year
Credit Hours: 3	Lectures: 2	Tutorial: 1 Lab/Practical: 2
	Total: 5	Pre-requisite: MNFN121

C - PROFESSIONAL INFORMATION

1 – COURSE LEARNING OBJECTIVES:

At the end of the course the students should demonstrate knowledge and understanding of the principles of different metal cutting processes, selection of cutting tool and process sheet.

2 - INTENDED LEARNING OUTCOMES (ILOs)

A - Knowledge and understanding:

On successful completion of the course the students should demonstrate knowledge and understanding of.

- a1- Characteristics of solid materials related to the metal cutting processes (A3).
- a2- Current classical production technologies as related to the production processes (A8).
- a3- Experimental determination of cutting parameters (energy, force, stress and strains) (A13).
- a4- Writing technical report required when solving production problems (A10).
- a5- Comparison of theoretical and practical metals cutting conditions (A12).

B - Intellectual skills:

On successful completion of the course the students should be able to:

- b1- Think in a creative and innovative way in determining the suitable cutting process (B3).
- b2- Apply knowledge from different sources to cutting process (B8).
- b3- Investigate the relation between theoretical and practical results of cutting process (B12).
- b4- Evaluate and appraise the cutting processes to a certain product (B16).

C- Professional and practical Skills.

On successful completion of the course the students should be able to:

- c1- Use different types of tools, techniques and equipment pertaining to the production process (C8).
- c2- Design an experimental system for measuring the metal cutting process parameters and compare with the theoretical ones (C8).
- c3- Use measuring instruments, workshop facilities, and processing equipment to design experiments for analyzing, collect, analyze, and interpret results of experiments (C5).
- c4- Use a wide range of tools, techniques, equipment, and processing to the metal cutting theories and develop computer programs (C6).
- c5- Apply safe systems when dealing with different technologies (C8).
- c6- Prepare and present technical reports required when solving problems and executing experiments (C12).

D - General and transferable skills:

On successful completion of the course the students should be able to:

- d1- Work in a team and involve in group discussion (D1, D3).
 d2- Collaborate effectively within multidisciplinary team. (D4)
 d3- Present findings in simple and illustrative way. (D5)

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction; Definition of technology, production system, manufacturing processes and elements of machining system	4	4	
Machining Deviations; reasons, types, dimensional deviation and ISO system of tolerances, definitions and denotations of geometric deviations, standardization and measurement of surface roughness.	3	4	2
Classification of metal cutting processes.	1		1
Turning process.	4	3	2
Measurement and inspections	4	4	2
Drilling and boring processes.	4	3	1
Planning, shaping, and slotting processes.	1	2	2
Milling process.	3	4	2
Surface and cylindrical grinding processes.	4	4	2
Note: At each metal cutting operations the following topics are going to be discussed; basic concepts, cutting tools and work pieces clamping methods, machine tool types and main parts, attainable accuracies and surface roughness, and sequences of operations required for specific applications for each metal cutting processes.			
Total	28	28	14

4 - Teaching and Learning methods:

Course Intended learning Outcomes (ILOs)	Lecture	Presentations and Movies	Discussions	Tutorials	Problem solving	Brain storming	Projects	Self-learning	Modeling	Laboratory Work
Knowledge & Understanding	X			X						X
Intellectual Skills	X			X	X					X
Professional Skills	X			X	X					X
General Skills	X									

5- Students' Assessment Methods:

Tools	To measure the content of	Time schedule	Grading
Problems	b1to b3 and c1 to c4	3 rd , 5 th , 7 th , and 9 th weeks	10
Assignments	a1 to a4, b1 to b3, c1 to c4 and d1 to d3	2 nd , 8 th , and 12 th weeks	10
Mid-term exam	a1 to a3, b1 to be and c1 to c3	7 th week	10
Final exam	a1 to a4, b1 to b3, c1 to c4 and d1 to d3	16 th week	70
Total			100

6- List of references:

- 6-1 Course notes: Lecture notes and ISO standard tables
 6-2 Essential books, Metal cutting processes, Lecture and exercise parts, by M. Merdan, Ph., D.

6-3 Recommended books;

Donald Brian Richardson Production Engineering Technology Palgrave Macmillan, 3rd edition, 1980

6-4 Periodicals, Web sites, etc. None

7- Facilities required for teaching and learning:

Lecture Rooms, Metrology Lab., and Workshops.

Course coordinator:	Prof. Dr. M. Merdan
Head of the Department:	Prof. Nabil gad Allah
Date:	12 / 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN222 Machine Design (I)

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: December 2018

B – Basic Information

Title: Machine Design (I) **Code:** MNFN222 **Level:** 2nd , First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 3 **Practical:** – **Total:** 5
Prerequisite: MNFN116

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the Design the dismountable & permanent joints, power screws, the loaded shafts and the springs applications, for the static and dynamic designs, based on the different static and dynamic failure theories.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Stress state at a point, principal stresses, failure theories under static and/or dynamic loading (A2).
- a2- Characteristics of ductile and brittle materials under static or dynamic loading (A3).
- a3- Principle of design of machine parts; shafts, power screws, dismountable joints, and helical springs under static or dynamic loading (A2, A4).
- a4- Application of failure theories on design shafts, dismountable and permanent joints, and helical springs (A2, A18).

b - Intellectual skills:

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

- b1- Determine the safety factor of machine parts under static and/or dynamic loading (B2).
- b2- Evaluate the characteristics of machine elements under dynamic loading (B5).
- b3- Investigate the failure of components under static and/or dynamic loading (B2, B6).
- b4- Apply the principles of mathematics to determine the principal stresses at critical points (B2, B13).

c - Professional and practical skills:

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

- c1- Apply knowledge of mathematics, science, and design to solve engineering problems concerns machines and devices of mechanical nature (C1).
- c2- Create and re-design mechanical systems as power screws machines (C3).
- c3- Prepare and present technical reports (C12).
- c4- Prepare engineering drawing and computer graphics for assembly drawing concern mechanical machines (C13).

d - General and transferable skills:

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

- d1- Practice self-learning through assignments and allocations self-reading. (D2, D7).
- d2- Present data and results orally and in written form (D3, D9).

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A2, A3, A4, A18
B Intellectual skills	B2, B5, B6, B13
C Professional and Practical Skills	C1, C3, C12, C13
D General and transferable skills	D2, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours
• Introduction; definitions, design phases and design considerations, mechanical properties of metals	2	1
• Analysis of stresses at a point		
• Stress element, Mohr's circle, Principle stresses, Maximum shear stress	2	4
• Design for static strength		
• Design for static strength for ductile materials	2	5
• Design for static strength for brittle materials	2	3
• Design for Fatigue strength		
• Introduction , fatigue failure, S-N diagram, endurance limit, definitions	2	4
• Fatigue strength under fluctuating stress cycles, Goodman diagrams, Goodman lines, Fatigue safety factor	3	6
• Fatigue strength under combined loadings , Fatigue safety factor	1	3
• Design of Shafts		
• Design of shafts by Goodman approach	1	2
• Design of shafts by Soderberg approach	1	1
• Design of screws, Fasteners and Connections		
• Power threads & design of power screws	2	3
• Bolted & riveted joints loaded in shear	2	3
• Flange coupling, jointed keys	2	2
• Design of Welded Joints	2	1
• Design of Helical Springs	4	4
Total hours	28	42

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods									Learning Methods				Assessment Method					
		Lecture	Presentations	Discussions & Seminars	Tutorials	Problem solving						Self-learning				Seminars	Quizzes	Reports	Mid-Term Exam	Written Exam
Knowledge & Understanding	a1	1			1	1											1	1	1	1
	a2	1															1	1	1	1
	a3	1			1	1											1	1	1	1
	a4				1	1					1							1		1
Intellectual Skills	b1	1			1	1												1	1	
	b2	1			1													1		1
	b3	1			1	1												1	1	1
	b4			1	1	1					1							1	1	1
Applied Prof. Skills	c1	1			1	1												1	1	1
	c2			1		1					1							1		
	c3			1														1		
	c4			1		1					1							1		1
General Tran. Skills	d1			1		1					1				1			1	1	1
	d2			1	1	1					1				1			1		

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Quizzes	Week no.: 4 , 6 ,9 &11	16
	Assignment	Week no.: 2 ,5 ,8 & 10	16
	Reports	Week no.: 6 & 10	8
Mid-Term Exam		7-th Week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

- 1- Serage E. Khalifa, Machine Design I, Modern Academy, Cairo, 2015, printed notes
- 2- Exercise work printed work

6-2 Required books: Non

6-3 Recommended books

1. Shigley J.E. (1986). Mechanical Engineering Design. first metric edition. McGraw- Hill.
2. R.S.KHURMI, J.K.GUPTA. (2003). A text book of Machine Design. EURASIA Publishing house (Pvt.) LTD.
3. Peter R.N. Childs, (1998) .Mechanical Design. John Wiley & Sons Inc.
4. Jack A. Collins, Henry R. Busby & George H. Staab. (2010). Mechanical Design of Machine elements and Machines, John Wiley & Sons Inc.

6-4 Periodicals, Web sites, etc.

1. <https://www.coursera.org/learn/machinedesign1>,last accessed November 18,2018
2. <http://www.scribd.com/doc/100573482/Design-of-Machine-Element.html>, November 18,2018.
3. <https://www.oreilly.com/library/view/basic-mechanical-engineering/9789332524415/xhtml/chapter015.xhtml>, November 18,2018.
4. <http://www.Learnerstv.com/Frec-Engineering-video-lectures-Ltvo77-Page1.html>, November 18,2018.

7- Facilities required for teaching and learning:

Lecture room, tutorial room, drawing hall; and Computer laboratory

Course coordinator:

Assoc. Prof. Serage El-din Khalifa

Head of the Department:

Prof. Nabil Gadallah

Date:

December 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN223: Foundry Technology

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B – Basic Information

Title: Foundry Technology	Code: MNFN223	Level: Junior, Second Semester
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:1
	Pre-requisite: MNFN112	Practical: 2

C - Professional information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding foundry technology, patterns and pattern making, molding, casting processes, melting, pouring and testing, and modernization and mechanization in foundry shop.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Introduction to foundry (A1)
- a2- Steps involved in casting advantages, limitations and implications of casting process. (A1).
- a3- Pattern types, allowances for pattern, pattern materials, color coding and storing of patterns. (A4).
- a4- Molding methods and processes, materials, equipment, molding sand ingredients, essential requirements, sand preparation and control, testing, cores and core making. (A4, A13)
- a5- Design considerations in casting, gating and risers, and directional solidification in casting (A4, A13, A19).
- a6- Sand castings, pressure die casting, permanent mould casting, centrifugal casting, precision investment, casting shell molding, CO2 molding, continuous casting, squeeze casting, electro slag casting. (A7)
- a7- fettling, finishing, and casting defects. (A13, A19)
- a8- Foundry remolding furnaces, selection of furnace, crucibles oil fired furnaces, electric furnaces cupola, calculation of cupola charges, hot blast cupola, degasification, inoculation, pouring equipment, and inspection of casting (A8, A19)
- a9- Need- Areas for mechanization, typical layout, sand reclamation techniques, and material handling (A19)
- a10- Pollution control in foundry (A11)
- a11- Computers in casting process (A18)

b - Intellectual skills:

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

- b1- Investigate the required properties to choose the casting method (B1, B13)
- b2- Select appropriate solutions for gating system, pattern, risers and cores problems based of analytical thinking (B2, B3)
- b3- Investigate the favor of component, systems and processes (B6)
- b4- Classify and compare the different casting methods (B2, B5, B15)

c - Professional and practical skills:

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

- c1- Design, assemble, operate, and test the casting component (C1, C3)
- c2- Calculate the characteristics of casting components (C1, C5)
- c3- Use computer software to design and calculate the casting components. (C5, C6, C17)
- c4- Use experimental facilities to investigate the defects and evaluate the characteristics of the casting component (C12, C13, C16)

d - General and transferable skills:

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

- d1- Work in a team and involve in good discussions and seminars (D1, D3)
- d2- Communicate effectively and present date and results orally and in written form (D3)

- d3- Search for information in references and in internet (D7)
d4- Practice self-learning through preparing reports (D7, D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A8, A11, A13, A18, A19
B	Intellectual skills	B1, B2, B3, B5, B6, B13, B15
C	Professional and Practical Skills	C1, C3, C5, C6, C12, C13, C16, C17
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to foundry	2	-	-
• Steps involved in casting advantages, limitations and implications of casting process	2	1	
• Pattern types, allowances for pattern, pattern materials, color coding and storing of patterns.	3	2	4
• Molding methods and processes, materials, equipment, molding sand ingredients, essential requirements	2	2	2
• sand preparation and control, testing, cores and core making	2	1	2
• Design considerations in casting, gating and risers, and directional solidification in casting	3	2	4
• Sand castings, pressure die casting, permanent mould casting, centrifugal casting, precision investment, casting shell molding, CO2 molding, continuous casting, squeeze casting, electro slag casting	3	2	5
• feting, finishing, and casting defects	2	1	2
• Foundry remolding furnaces, selection of furnace, crucibles oil fired furnaces, electric furnaces cupola, calculation of cupola charges, hot blast cupola, degasification, inoculation, pouring equipment, and inspection of casting	3	1	5
• Need- Areas for mechanization, typical layout, sand reclamation techniques, and material handling	2	1	2
• Pollution control in foundry	2		
• Computers in casting process	2	1	2
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method					
		Lecture	Presentations	Discussions & Questions	Tutorials	Problem solving	Laboratory & experiments		Researches & Modeling				Written Exam	Practical Exam.	Quizzes	Term Papers	Assignments	
Knowledge & Understanding	a1	1	1	1					1				1		1	1	1	
	a2	1	1	1	1	1	1		1	1			1	1	1	1	1	
	a3	1	1	1	1	1	1		1	1			1	1	1	1	1	
	a4	1	1	1	1	1	1		1	1			1	1	1	1	1	
	a5	1	1	1	1	1	1		1	1			1	1	1	1	1	
	a6	1	1	1	1	1	1		1	1			1	1	1	1	1	
	a7	1	1	1	1	1	1		1	1			1	1	1	1	1	
	a8	1	1	1	1	1			1	1			1		1	1	1	
	a9	1	1	1	1	1			1	1			1		1	1	1	
	a10	1	1	1	1	1			1	1			1		1	1	1	
	a11	1	1	1	1	1	1		1	1			1	1	1	1	1	

Intellectual Skills	b1	1	1	1	1	1	1			1	1			1	1	1		1		
	b2	1	1	1	1	1	1			1	1			1	1	1	1	1		
	b3	1	1	1	1		1			1	1			1	1	1	1	1		
	b4	1	1	1	1		1			1	1			1	1	1	1	1		
Applied Prof. Skills	c1	1	1	1	1		1				1			1	1	1		1		
	c2	1	1	1	1	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	1		
General Tran. Skills	d1			1		1	1			1						1				
	d2		1	1						1										
	d3			1						1										
	d4		1	1		1	1			1	1						1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Practical Exam	13 th Week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course Notes

Foundry Technology (Lecture notes).

6-2 Required Books

- 1- Jain P.L. "Principles of Foundry Technology", Tata McGraw Hill Publishing Company Ltd., 1995.
- 2- Lindberg R.A. "Process and Materials of Manufacture", Prentice Hall of India (p) Ltd., ASM, Metals Handbook on Casting, 1992.
- 3- Taylor H. F. Flemings M. C. & Wulff J. " Foundry Engineering", Wiley Eastern Ltd., 1993.

6.3 Recommended books

None

6-3 Periodicals, Web sites, etc.

None

7- Facilities required for teaching and learning:

Lecture room, Computer, Data show

Course coordinator:

Assist. Prof. Adel Elgamal

Head of the Department:

Prof.Nabil Gadalla

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN224: Machine Design (II)

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: Machine Design (II) **Code:** MNFN224 **Level:** 2nd Level, 2nd Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 3 **Total:** 5
Pre-requisite: MNFN222

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the Design the sliding and anti-friction bearings, the spur, helical and worm gearings, for the static and dynamic loadings, based on the different static and dynamic failure theories.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Kinds of lubrication, lubrication of sliding bearings and hydrodynamic theory (A2).
- a2- Lubricant characteristics in sliding bearings during operation (A3).
- a3- Principle of design of rolling, control bearings, spur gears, helical gears bevel gears and worm gearing (A4).
- a4- Application of failure theories on design of spur, helical, bevel and worm gearing (A18).

b - Intellectual skills:

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

- b1- Determine the load carrying capacity of sliding, rolling contact bearings and gears (B2).
- b2- Evaluate the characteristics of lubricant in sliding bearings (B5).
- b3- Investigate the failures of bearings, and gears during operation (B6).
- b4- Apply the principles of mathematics and science to check gears against fatigue and surface fatigue failures (B13).

c - Professional and practical skills:

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

- c1- Apply knowledge of mathematics, science, information technology, and design to solve engineering problems concerns bearings and gearboxes (C1).
- c2- Create and re-design mechanical systems as gearboxes (C3).
- c3- Prepare and present technical reports (C12).
- c4- Prepare engineering drawing and computer graphics for assembly drawing concern bearings and gearboxes (C13).

d - General and transferable skills:

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

- d1- Practice self-learning through assignments and allocations self-reading. (D7).
- d2- Present data and results orally and in written form (D3, D9).

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A2, A3, A4, A18
B Intellectual skills	B2, B5, B6, B13
C Professional and Practical Skills	C1, C3, C12, C13
D General and transferable skills	D2, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours
• Hydrodynamic bearings theory	4	3
• Hydrodynamic bearings design	2	6
• Rolling contact bearings		
1. Kinds and Fundamentals	2	3
2. Selection of Bearings	2	3
• Fundamentals, Type of Gears and Involute gear tooth	2	3
Mid Term Exam		
• Spur gears		
1. Force Analysis	2	3
2. Bending Fatigue		
3. Surface Fatigue (Surface Durability)	2	3
• Helical gears		
1. Force Analysis	2	3
2. Bending Fatigue and Surface Fatigue (Surface Durability)	2	3
• Bevel gears		
1. Force Analysis	2	3
2. Bending Fatigue and Surface Fatigue (Surface Durability)	2	3
• Worm gears		
1. Force Analysis	2	3
2. Bending Fatigue and Surface Fatigue (Surface Durability)	2	3
Total hours	28	42

4 - Teaching and Learning and Assessment methods:

Course ILO's			Teaching Methods										Learning Methods			Assessment Method					
			Lecture	Presentations	Discussions & Seminars	Tutorials	Problem solving							Self-learning				Seminars	Quizzes	Reports	Mid-Term Exam
Knowledge & Understanding	a1	1				1	1											1	1	1	1
	a2	1																1	1	1	1
	a3	1				1	1											1	1	1	1
	a4					1	1					1							1		1
Intellectual Skills	b1	1				1	1												1	1	1
	b2	1				1													1		
	b3	1				1	1												1	1	1
	b4			1		1	1						1						1	1	1
Applied Prof. Skills	c1	1				1	1												1	1	1
	c2				1		1						1						1		
	c3				1														1		
	c4				1		1						1						1		1
General Tran. Skills	d1				1		1						1				1		1	1	1
	d2				1	1	1						1				1		1		

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Class Work	Bi-Weekly	20
	Assignments (H.W)	At Even weeks	10
	Quizzes	4 Times at 3 rd , 6 th , 9 th and 12 th Weeks	10
Mid-Term Exam		7-th Week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Essential books

Machine Design II, Printed lecture Modern Academy, Cairo, 2012.

6-2 Recommended books

1. SHIGLEY'S MECHANICAL ENGINEERING DESIGN, TENTH EDITION
Published by McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121. Copyright © 2015 by McGraw-Hill Education. ISBN 978-0-07-339820-4
2. R.S.KHURMI,J.K.GUPTA, A text book of Machine Design, EURASIA Publishing house (Pvt.) LTD,2003
3. Peter R.N. Childs, Mechanical Design, John Wiley & Sons Inc,1998
4. Jack A. Collins, Henry R. Busby & George H. Staab, Mechanical Design of Machine elements and machines, John Wiley & Sons Inc,2010

6-3 Periodicals, Web sites, etc.

1. <http://www.onesmartclick/engineering/machine-design.html>
2. <http://www.scribd.com/doc/100573482/Design-of-Machine-Element.html>
3. <http://www.Learnerstv.com/Frec-Engineering-video-lectures-Ltvo77-Page1.html>

7- Facilities required for teaching and learning:

- Lecture room, tutorial room, drawing hall; and Computer laboratory

Course coordinator:

Assist. Prof. Ahmed EL Sanabary

Head of the Department:

Prof. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN225: Engineering Metrology

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Engineering Metrology	Code: MNFN225	Year/level: Junior 6 th Semester
Credit Hours: 3	Lectures: 2	Tutorial: 1
	Practical: 2	Total: 3
		Pre-requisite: MNFN121

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:

- Identify the metrological system characteristics
- Choose the suitable instrument for the specified metrological experiment.
- Elaborate metrological experiment, take results, analyze these results, treat them statistically, plot them and write a report for this experiment.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1-The metrological system's elements, units & characteristics. (A3)
- a2-The metrological standards (of length, tolerances, shape and positional tolerances & surface roughness) (A4)
- a3-The different metrological sensors used for different metrological parameter (length, angles, thread, surface roughness, out of roundness). (A3)
- a4- 3-D measuring machines and a computer software for engineering metrology. (A15)

B - Intellectual skills

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

- b1- identify the metrological instrument's characteristics. (B4)
- b2- choose the instrument, suitable for the specified metrological phenomenon. (B5)
- b3- design, prepare and elaborate a simple metrological experiment. (B5) – (B8)
- b4- Design a metrological measuring system. (B11) – (B14), (B20)
- b5- Statistically treat the metrological measurements. (B11) – (B16)

C - Professional and practical skills

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

- c1- Build up metrological measuring systems, based on the used metrological instrumentation's characteristics, in addition to the measured metrological phenomenon. (C2)
- c2- Build up metrological transducers utilizing different sensors convenient for the corresponding measurements. (C3)
- c3- Measure the metrological quantities by the previously mentioned devices. (C5)
- c4- Evaluate the measured metrological data, treat them statistically and to analyze the obtained results. (C16)

D - General and transferable skills

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

- D1- Work in stressful environment and within constraints. (D2)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A4, A15
B	Intellectual skills	B4, B5, B8, B11, B 14, B16, B20
C	Professional and Practical Skills	C2, C3, C5, C16
D	General and transferable skills	D2

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Errors in measurements.	3	2	4
Light waves as standard of length.	4	1	3
Standard for dimensional tolerances.	2	1	2
Linear measurements.-Angular measurements and circular divisions.	2	1	2
Limits and limit gauge design.-Machine tool metrology.	2	1	2
Gear measurements.-Thread measurements	2	1	2
Surface roughness measurements	2	1	2
Standard for shape and positional deviations	2	1	2
3-D measuring machines	4	2	3
Computer software for engineering metrology	3	2	4
Revision	2	1	2
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Teaching and Learning and Assessment Methods																							
Course ILO's		Teaching Methods								Learning Methods				Assessment Method									
		Lecture	Presentations	Discussions & Case Studies	Tutorials	Problem Solving	Laboratory					Modeling	Self-learning	Experimental				Class	Quizzes	Reports	Mid-Term	Practical	Written Exam
Knowledge & Understanding	a1	1	1	1														1		1			1
	a2	1			1	1	1					1						1		1			1
	a3	1	1	1	1	1	1					1						1	x	1	1		1
	a4	1	1	1														1		1			1
Intellectual Skills	b1	1	1		1	1	1					1						1		1			1
	b2	1			1	1	1					1						1		1			1
	b3	1	1		1	1	1					1						1		1			1
	b4	1	1		1	1	1					1						1		1			1
	b5	1			1	1	1					1						1		1			1
Applied Prof. Skills	c1	1	1		1	1	1					1						1	1	1	1	1	1
	c2	1			1	1	1					1						1	1	1	1	1	1
	c3	1		1	1	1	1					1						1	1	1	1	1	1
	c4	1		1	1	1	1					1						1	1	1	1	1	1
General Tran. Skills	d1	1	1	1			1					1						1	1	1	1	1	1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Quizzes & Reports	Weekly	20
Mid-Term Exam	6 th . Week	20
Practical Exam	15 th . week	20
Written Exam	16 th . week	40
Total		100

6- List of references:

6-1 Course notes

N. Gadallah, Lecture notes of Metrology, Modern Academy, 2008

6-2 Required books

6-3 Recommended books:

J.F.W. Galyer, "Metrology for Engineers", ELBS, 1998

6-4 Periodicals, Web sites, etc.: www.HBM.com

7- Facilities required for teaching and learning:

- Measurements Lab.
- Computer, Data show, Lap View Package

Course coordinator:

Dr. Nasr Aref

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN260 : Industrial Training (1)

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Eng. and Production Tech. Department
Department offering the course: Manufacturing Eng. and Production Tech. Department
Date of specifications approval: September 2018

B - Basic Information

Title: Industrial training (1) **Code:** MNFN260 **Year/level:** Senior 1,7th semester
Credit Hours: **Lectures:** - **Tutorial:** - **Practical:** 60 hours
Pre-requisite: 65 credit hours

C - Professional Information

1 – Course Learning Objectives:

Providing real world working environment perspective and real experience of working in industry.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Applicability of theoretical knowledge gained during academic sessions. (A18)
- a2- Actual needs of business of the domain of specialization (A19)

b - Intellectual skills:

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

- b1-Develop the personal attitudes to serve the society. (B11)
- b2- Develop personal contacts in the field (B4)

c - Professional and practical skills:

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

- c1- Practicing the actual production cycle (C1, C15, C18, C19)

d - General and transferable skills:

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

- d1- Presenting a report that includes all information about the training. (D3)
- d2- Presenting personal qualities. (D6).
- d3- Communicate effectively by diverse ways. (D3).
- d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A18, A19
B Intellectual skills	B4, B11
C Professional and practical skills	C1, C15,C18,C19
D General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
<ul style="list-style-type: none"> • Practical industrial training for two weeks- during the summer vacation at the end of the 6th semester- in a recognized industrial establishment. • At the end of the training, student should submit a report with the following information: <ul style="list-style-type: none"> ✓ Profile of the industry ✓ Organization structure. 	10		40

<ul style="list-style-type: none"> ✓ Product range ✓ Processes ✓ Machines, equipment, devices. ✓ Personnel welfare scheme ✓ Details of the training undergo ✓ Projects undertaken during the training.(if any) 			
Total hours	10		40

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method										
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Site Visits	Projects				Modeling & Simulation	Self-learning	Cooperative	Researches & Reports				Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1						1	1				1	1		1									
	a2						1						1		1									
Intellectual Skills	b1		1	1			1					1	1											
	b2						1						1											
Applied Professional Skills	c1						1	1							1									
General Tran. Skills	d1														1					1				
	d2			1			1						1			1								
	d3						1	1							1									
	d4							1					1											

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Evaluation of the foundation	Daily during the training	60
Report from student of the training	By the end of the training period	40
Total		100

6- List of references:

6-1 Course notes: None

6-2 Required books None

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning: None

Course coordinator:

Prof. Nabil Gadalla

Head of the Department:

Prof. Nabil Gadalla

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN261 : Seminar-1

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
 Department offering the program: Manufacturing Eng. and Production Tech. Department
 Department offering the course: Manufacturing Eng. and Production Tech. Department
 Date of specifications approval: September 2018

B - Basic Information

Title : Seminar-1 Code: MNFN261 Year/level: Junior ,5th semester
 Credit Hours: 1 Lectures: Tutorial: 2 Practical:
 Pre-requisite: 47 Credit Hours +GENN141+ GENN142

C - Professional Information

1 – Course Learning Objectives:

Providing a concept on the exploitation of technology for the advancement of human kind and an introduction to the engineering discipline.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding:

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

- a1- The definition and evolution of technology. (A13)
- a2- Human and social consideration in engineering design and social problems (A9, A11))

b - Intellectual skills:

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

- b1- Solve engineering problems (B2, B7)
- b2- Decide the technology selection and consider its social impacts (B9, B10)

c - Professional and practical skills:

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

- c1- Apply knowledge of different engineering disciplines in technological applications (C1, C2, C9)

d - General and transferable skills:

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

- d1- Present a report that includes all information about the seminar. (D3)
- d2- Present personal qualities. (D6).
- d3- Communicate effectively by diverse ways. (D3).
- d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A9, A11, A13
B	Intellectual skills	B2, B7, B9, B10
C	Professional and Practical Skills	C1, C2, C9
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
<ul style="list-style-type: none"> The course consists of a number of seminars concerned with the development of technology and its impact to society, It covers the following areas: <ul style="list-style-type: none"> ✓ The definition and evolution of technology. ✓ Technology and society ✓ Technology and Innovation. ✓ Technology selection decision and social considerations ✓ Engineering design. ✓ Engineering problem solving. ✓ Human and social considerations in engineering design, and social problems. ✓ Concepts of the exploitation of technology for the advancement of human kind. 		28	
Total hours		28	

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method										
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Site Visits	Projects				Modeling & Simulation	Self-learning	Cooperative	Researches & Reports				Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1			1	1		1				1			1				1		1				
	a2			1	1		1				1			1				1		1				
Intellectual Skills	b1		1	1	1		1				1			1				1		1				
	b2		1	1	1		1				1			1				1		1				
Applied Professional Skills	c1		1		1	1	1	1			1			1				1						
General Tran. Skills	d1		1	1			1							1				1		1				
	d2		1	1			1							1				1		1				
	d3		1	1			1							1				1		1				
	d4		1	1			1							1				1		1				

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Reports	During the semester	30
	Presentations		30
Oral Exam		By the end of each seminar	40
Total			100

6- List of references:

6-1 Course notes: None

6-2 Required books None

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning: None

Course coordinator:	Prof. Nabil Gadalla
Head of the Department:	Prof. Nabil Gadalla
Date:	September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN262 : Seminar-2

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Eng. and Production Tech. Department
Department offering the course: Manufacturing Eng. and Production Tech. Department
Date of specifications approval: September 2018

B - Basic Information

Title : Seminar-2
Credit Hours: 1
Code: MNFN262
Lectures: -
Year/level: Junior ,6th semester
Tutorial: -2
Practical:
Pre-requisite: MNFN261

C - Professional Information

1 – Course Learning Objectives:

Providing a concept on the exploitation of technology for the advancement of human kind and an introduction to the engineering discipline.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding:

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

- a1- The definition and evolution of technology. (A13)
- a2- Human and social consideration in engineering design and social problems (A9, A11))

b - Intellectual skills:

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

- b1- Solve engineering problems (B2, B7)
- b2- Decide the technology selection and consider its social impacts (B9, B10)

c - Professional and practical skills:

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

- c1- Apply knowledge of different engineering disciplines in technological applications (C1, C2, C9)

d - General and transferable skills:

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

- d1- Present a report that includes all information about the seminar. (D3)
- d2- Present personal qualities. (D6).
- d3- Communicate effectively by diverse ways. (D3).
- d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A9, A11, A13
B	Intellectual skills	B2, B7, B9, B10
C	Professional and Practical Skills	C1, C2, C9
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
<ul style="list-style-type: none"> The course consists of a number of seminars concerned with the development of technology and its impact to society, It covers the following areas: <ul style="list-style-type: none"> ✓ The definition and evolution of technology. ✓ Technology and society ✓ Technology and Innovation. ✓ Technology selection decision and social considerations ✓ Engineering design. ✓ Engineering problem solving. ✓ Human and social considerations in engineering design, and social problems. ✓ Concepts of the exploitation of technology for the advancement of human kind. 		28	
Total hours		30	

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method									
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Site Visits	Projects				Modeling & Simulation	Self-learning	Cooperative	Researches & Reports			Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1			1	1		1					1			1			1		1			
	a2			1	1		1					1			1			1		1			
Intellectual Skills	b1		1	1	1		1					1			1			1		1			
	b2		1	1	1		1					1			1			1		1			
Applied Professional Skills	c1		1		1	1	1	1				1			1			1					
General Tran. Skills	d1		1	1				1							1			1		1			
	d2		1	1				1							1			1		1			
	d3		1	1				1							1			1		1			
	d4		1	1				1							1			1		1			

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Reports	During the semester	30
	Presentations		30
Oral Exam		By the end of each seminar	40
Total			100

6- List of references:

6-1 Course notes: None

6-2 Required books: None

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning: None

Course coordinator:	Prof. Nabil Gadalla
Head of the Department:	Prof. Nabil Gadalla
Date:	September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN311: Mechanical Measurements

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: Mechanical Measurements **Code:** MNFN311 **Year/level:** Senior 1- 8th. semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:-**
 Practical: 2 **Total:** 4
 Pre-requisite: MNFN111

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:

- Identify the instrument's & measuring system characteristics
- Choose the suitable instrument for the specified measured phenomenon.
- Elaborate an experiment, take results, analyze these results, treat them statistically, plot them and write a report for this experiment.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1-Measuring system's elements. (A3)
- a2-Measuring units & characteristics (A4)
- a3-Different measuring sensors used for different mechanical phenomenon (strain, stress, force, torque, power, pressure, temperature, viscosity and fluid flow) (A3)

B - Intellectual skills

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

- b1- identify the instrument's characteristics (B4)
- b2- choose the instrument, suitable for the specified measured phenomenon. (B5)
- b3- design, prepare and elaborate a simple experiment (B5) – (B8)
- b4- Design a measuring system (B11) – (B14), (B20)
- b5- Statistically treat the measurements. (B11) – (B16)

C - Professional and practical skills

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

- c1- Build up measuring systems, based on the used instrumentation's static and dynamic characteristics, in addition to the measured phenomenon. (C2)
- c2- Build up measuring transducers utilizing different sensors convenient for corresponding measurements. (C3)
- c3- Measure the physical quantities by the previously mentioned devices. (C5)
- c4- Evaluate the measured data, to treat them statistically and to analyze the obtained results. (C16)

D - General and transferable skills

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

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

Course Contribution in the Program ILO's

	Intended Learning Outcomes	Program ILO's
A	Knowledge and understanding	A 3, A 4
B	Intellectual skills	B 4, B 5, B 8, B 11, B14, B 16, B20
C	Professional and practical skills	C2,C3,C5,C16
D	General and transferable skills	D2

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Measuring system characteristics	4		4
Traceability, uncertainty & calibration	2		2
Strain measurements: Wire strain gauges	2		2
Strain measurements: Extensometers	2		2
Stress measurements: Photo-elasticity	2		2
Time and speed measurements	2		2
Acceleration and frequency measurements	2		2
Force and torque measurements	2		2
Power measurements	2		2
Pressure measurements	2		2
Solid and fluid level measurements	2		2
Viscosity measurements	2		2
Fluid flow measurements	2		2
Total hours	28		28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods									Learning Methods				Assessment Method									
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory					Modeling	Self-learning	Experimental				Class Works	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam	
Intellectual Skills	Knowledge e &	a1	1	1	1														1			1		1
		a2	1			1	1	1						1					1			1		1
		a3	1	1	1	1	1	1						1					1	1	1	1	1	1
		b1	1	1		1	1	1						1					1		1		1	1
		b2	1			1	1	1						1					1		1		1	1
		b3	1	1		1	1	1						1					1		1		1	1
		b4	1	1	1	1	1	1						1					1	1	1	1	1	1
		b5	1	1		1	1	1						1					1		1		1	1
Applied Prof. Skills	c1	1	1		1	1	1						1					1	1	1	1	1	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	1	1	1	
General Tran. Skills	d1	1	1	1			1						1					1	1	1	1	1	1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Quizzes & Reports	Weekly	20
Mid-Term Exam	6 th . Week	20
Practical Exam	15 th . week	20
Written Exam	16 th . week	40
Total		100

6- List of references:

6-1 Course notes

N. Gadallah, Lecture notes of Measurements & Instrumentation, Modern Academy, 2008

6-2 Required books

- C.V. COLLETTE & A.D. HOPE, Engineering Measurements, the English Language Book Society & Pitman, 3rd. Ed., 1999;
- L.F. ADAMS, Engineering Measurements & Instrumentation, the English Universities Press Ltd., 1986;
- Ernest O. DOEBELIN, Measurements Systems, McGraw-Hill Kogakusha, LTD International Student Ed., 1976.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.: www.HBM.com

7- Facilities required for teaching and learning:

- Measurements Lab.
- Computer, Data show

Course coordinator:

Prof. Dr. Nabil Gadallah

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN312: Industrial Operations Research

A- Affiliation

Relevant program:	Manufacturing Engineering & Production Technology BSc. Program
Department offering the program:	Manufacturing Engineering & Production Technology Department.
Department offering the course:	Manufacturing Engineering & Production Technology Department.
Date of specifications approval:	December 2018

B - Basic information

Title: Industrial Operations Research	Code: MNFN312	level: 4 Seventh semester
Credit Hours: 3	Lectures: 2	Tutorial: 2 Practical:-
	Prerequisites: - None	

C - Professional Information

1 – Course Learning Objectives:

The main objectives of this course are to introduce the methodologies of operations research in formulating and solving the problems which are raised when running production systems.

a- Knowledge and Understanding

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

- a1 Concepts of mathematics and sciences, appropriate to operations research (A1).
- a2 Basics of linear programming technology related to operations research problems solving (A2).
- a3 Solve transportation model and its application (A5)
- a4 Application of network models for production lines (A12).
- a5 Construction of project scheduling PERT, CPM (A14).
- a6 Basic of decision analysis and waiting line models (A16).

b- Intellectual Skills

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

- b1 Select appropriate mathematical and computer-programming methods for modeling and analyzing problems arose when running production systems (B1).
- b2 Select appropriate solutions for OR formulated problems (B2).
- b3 Think in a creative and innovative way in solving transportation model and application (B3)
- b4 Solve manufacturing problems, often on the basis of limited resources (B7).
- b5 Select suitable method for solving operation research problems (B8).
- b6 Analyze results of waiting line models and take decision analysis (B11).
- b7 Apply network models for production line (B13).
- b8 Use dynamic programming application for solving operation research problems (B17).

c- Professional and Practical Skills

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

- c1 Apply knowledge of mathematics to solve manufacturing problems (C1).
- c2 Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services when running production systems (C2).
- c3 Apply numerical modeling methods to manufacturing problems raised when running production systems (C7).
- c4 Solve operation research problems by suitable method (C1,C8)
- c5 Prepare and present technical reports required to present manufacturing problems solution (C12).
- c6 Use related computer software to solve manufacturing problems (C17).

d- General and Transferable Skills

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

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

- d4 Effectively manage tasks, time, and limited resources when solving OR problems as related to manufacturing (D6).
- d5 Refer to relevant literatures in technology and OR (D9).

2- Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A2,A5, A12, A14, A16
B	Intellectual skills	B1, B2,B3, B7, B8, B11, B13, B17.
C	Professional and practical skills	C1, C2, C7, C8, C12, C17.
D	General and transferable skills	D1, D3, D6, D7,D9.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. An Introduction to Linear Programming.	2	2	-
2. Linear Programming – graphical solution	2	2	-
3. Linear Programming Simplex method	4	4	
4. sensitivity and duality	2	2	
5. Integer linear programming applications	2	2	
6. Assignment problem, applications in production lines	2	2	
7. Transportation model solution and applications	4	4	-
8. Project scheduling: PERT, CPM	4	4	
9. Waiting line models	2	2	
10. Decision analysis	2	2	
11. Dynamic Programming Applications	2	2	
Total	28	28	-

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations	Discussions & Activities	Tutorials	Problem Solving	Case Studies	Guest Lectures	Field Trips	Modeling	Self-learning	Group Work	Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam					
Knowledge & Understanding	a1	1	1	1							1				1	1		1		1			
	a2	1			1	1									1	1		1		1			
	a3	1	1	1	1	1				1	1				1	1	1	1		1			
	a4	1	1	1						1	1				1	1		1		1			
	a5	1		1	1	1					1				1	1		1		1			
	a6	1	1	1	1	1				1	1				1	1		1		1			
Intellectual Skills	b1	1	1		1	1					1				1	1		1		1			
	b2	1			1	1				1					1	1		1		1			
	b3	1	1		1	1									1	1		1		1			
	b4	1				1				1						1		1		1			
	b5	1				1				1						1		1		1			
	b6	1				1				1						1		1		1			
	b7	1				1				1						1		1		1			
	b8	1				1				1						1		1		1			
Applied Professional Skills	c1	1	1		1	1					1				1	1	1	1		1			
	c2	1			1	1									1	1	1	1		1			
	c3	1		1	1	1				1	1					1	1	1		1			
	c4	1		1	1	1				1	1				1	1	1	1		1			
	c5		1		1	1				1	1						1						
	c6	1				1					1					1				1			

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

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Lecture notes

6-2 Essential books (text books): None

6-3 Recommended books: Anderson and Sweeney, "An introduction to management science, Quantitative approach", Thomson South-western, 2008

6-4 Periodicals, Web sites, etc. None

6-5 Technological Tables, None

7- Facilities required for teaching and learning:

Lecture and exercise rooms

Course coordinator:

Dr. Mohamed Saad Abdelkarim

Head of the Department:

Prof. Nabil Gadalla

Date:

December 2018

Course Specification
MNFN313:Automatic Control

A- Affiliation

Relevant program/s: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: December 2018

B - Basic Information

Title: Automatic Control **Code:** MNFN313 **Level:** 3rd (Senior 1), Second Semester
Credit Hours: 3 **Pre-requisite:** MTHN103
Contact Hours: **Lectures:** 2 **Tutorial:** 2 **Laboratory:** 1 **Total:** 5

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand the basic concepts and theories of automatic control. He should be able to analyze the systems stability and precision and implement the necessary classical controllers including the P, PI and PID controllers. The controlled system should be precise with the required degree of precision and stable with the required degree of stability.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Basic equations and mathematical modeling of simple systems (A1).
- a2- Block diagram algebra and signal flow graphs (A5)
- a3- Time domain analysis of control system; procedure of calculation of the transient response of typical systems and system identification based on the step response (A5)
- a4- Effect of roots of characteristic equation on the transient response and system stability (A4)
- a5- Procedure of calculation and plotting of the frequency response; polar plot and Bode diagram and system identification based on the frequency response (A4, A15)
- a6- Steady state error and evaluation of the precision of closed loop system (A4)
- a7- Routh-Herwitz and Nyquist stability criteria (A4)
- a8- Root locus interpretation (A4)
- a9- Compensation of control system and classical controllers; Proportional Integral Derivative controller (PID) (A4)
- a10- Characteristics of typical instruments, sensors and controllers (A3)

b - Intellectual skills:

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

- b1- Deduce mathematical models and transfer functions for typical mechanical systems (B1)
- b2- Investigate the transient response and frequency response of control systems (B5)
- b3- Identify the studied system on the basis of the transient or frequency response (B13)
- b4- Judge the feedback systems accuracy and stability (B13)
- b5- Investigate how to improve the feedback system stability and precision, and design the PID controller (B15)

c - Professional and practical skills:

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

- c1- Construct, test and investigate the performance of typical control systems; pressure control, flow control and speed control, ... (C5, C17)
- c2- Design of a proper controller for a given system (C1).
- c3- Use the suitable software to carry out the system analysis, and calculate the system response and improve its stability and precision. (e.g. MATLAB, SIMULINK, CODAS) (C5)
- c4- Use experimental facilities to investigate the system performance (C16,C17).

d - General and transferable skills:

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

- d1- Search for information's from diverse references and internet (D7).
- d2- Write technical reports and prepare convenient presentations (3)
- d3- Use the Email for communication (D3, D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4, A5, A15
B	Intellectual skills	B1, B5, B13, B15
C	Professional and Practical Skills	C1, C5, C16, C17
D	General and transferable skills	D3, D4, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction, basic definitions and terminology	2		
• Mathematical topics		3	
• Transfer functions, definition and case studies	2	2	
• Block diagrams; conventions, block diagram algebra and reduction of block diagrams.	2	2	
• Signal flow graphs; definition, conventions and Mason's formula	1		
• Time domain analysis			
• Transient response of proportional, integrating and first order elements.	2	2	
• Transient response of second order elements. Effect of location of roots of characteristic equation on the transient response	3	4	
• System identification based of the transient response.	2	2	
• Instruments, sensors and controllers			2
• Level control			2
• Flow control			2
• Speed control			1
• Temperature control			2
• Robotic arm control			1
• Frequency response			
• Frequency response; Polar plot and Bode plots.	4	4	
• System identification based of the transient and frequency responses.	2	2	
• Accuracy of feedback systems; steady state error.	2	1	
• Stability of feedback systems; Routh-Herwitz and Nyquist stability criteria.	3	4	
• Root locus analysis	1	-	
• Design and tuning of P, PI and PID controllers	2	2	4
Total hours	28	28	14

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments			Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1			1									1		1		1			
	a2	1			1									1		1		1			
	a3	1	1		1	1				1	1			1		1	1	1			
	a4	1	1								1					1					
	a5	1	1		1	1				1	1			1		1	1	1			
	a6	1	1		1									1		1	1	1			
	a7	1			1									1		1	1	1			
	a8	1																1			

Intellectual Skills	a9	1	1		1	1						1			1		1	1	1				
	a10						1								1		1						
	b1	1			1							1			1		1	1	1				
	b2	1	1		1							1			1	1	1	1	1				
	b3	1			1		1					1			1	1	1	1	1				
	b4	1	1		1		1					1			1	1	1	1	1				
	b5	1		1	1	1						1	1		1		1	1	1				
Applied Prof. Skills	c1						1								1								
	c2	1			1	1						1			1		1	1	1				
	c3	1	1		1												1	1	1				
	c4						1								1		1						
General Skills	d1											1	1					1	1				
	d2											1						1	1				
	d3											1						1	1				

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Laboratory work printed notes

6-2 Required books

RABIE M. G. (2010) Automatic Control for Mechanical Engineers, Cairo: MAM Press, ISBN 977-17-9869-3

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

http://csd.newcastle.edu.au/course_notes.html, (Last accessed October 20, 2018).

<http://www.williamsonic.com/BodeNyquist/index.html>, (Last accessed October 20, 2018).

<https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-06-principles-of-automatic-control-fall-2012/lecture-notes/>, (Last Accessed October 20, 2018).

7- Facilities required for teaching and learning:

- Automatic Control Lab.
- Computer Lab, Data show and Computer programs; MATLAB, CODAS and TK-Solver

Course coordinator: Professor M Galal Rabie

Head of the Department: Professor Nabil Gadallah

Date: December 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN321: JOINING PROCESSES

A- Affiliation

Relevant program:	Mechanical Engineering & Production Technology, BSc Program
Department offering the program:	Mechanical Engineering & Production Technology Dept.
Department offering the course:	Mechanical Engineering & Production Technology Dept.
Date of specifications approval:	25/12/2018

B - Basic Information

Title: Joining processes	Code: MNFN321	Year/level: 3 rd , Seventh semester
Credit Hours:3	Lectures: 2	Tutorial:1 Practical: 2
	Pre-requisite: MNFN112	

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of joining processes and its different types, economic importance, and typical industrial applications.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1 – Introduction, classification of joining, basic concepts, economic importance of joining, typical industrial applications, and welding symbols. (A1, A4).
- a2 - Soldering and brazing, practice of soldering, joint types and preparation, fluxes, heat sources and heat transfer. Practice of brazing, filler materials, heat sources, different types of brazing, and braze welding. (A4, A13)
- a3 – Welding, oxy-acetylene welding, arc welding, resistance welding, spot welding, electron beam welding, thermite welding, MIG , TIG , MAG ...etc practice joint design and preparation. Filler material. (A4, A13)
- a4 – Basic science of joining processes, sources of heat energy, the flame, the electric arc, chemical reactions during welding, oxidation reaction, and protection of weld pool with fluxes or gases. Theory of distortion. (A4, A13, A19)
- a5 - Metallurgy of welding , microstructure changes during welding, the effect of heat on melts, pretreatment and post treatment of welds, behavior of ferrous and non-ferrous metals, fracture of welds (A8, A13, A19).
- a6 – Inspection and testing of welds and joints, mechanical testing, non-destructive testing, and weld defects. (A13, A18, A19)
- a7 – Adhesives, contact adhesives, polyester, polyamide and polyurethane melt adhesives, toughed acrylic and epoxy adhesives, silicone adhesives, mechanical properties and fracture mechanics, and joint design. (A8, A13)
- a8 - Joining ceramics , metal/ceramic joining and ceramic/ceramic joining, thermo-chemical considerations.(A4, A13, A19)
- a9 – Diffusion bonding, brazing methods, joint design (A4, A13, A19).

b - Intellectual skills:

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

- b1- Investigate required properties to choose the joining method. (B1, B13)
- b2 - Select appropriate solution for joint design and preparation based on analytical thinking (B2, B3)
- b3 – Investigate the failure of joint (B6).
- b4- Classify and compare different joining methods. (B2, B5, B15).

c - Professional and practical skills:

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

- c1 – Design, assemble, operate, and test the joining components. (C1, C3).
- c2 – Calculate the characteristics of joining components. (C1, C5).
- c3 - Use computer software to design and calculate the joining design. (C5, C6, C17).

c4 – Use experimental facilities to investigate the defects and evaluate the characteristics of the metallurgical changes during welding. (C12, C13, C16).

d - General and transferable skills:

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

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

d2 – Communicate effectively and present data and results orally and in written form (D3, D9).

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

d4 - Practice self-learning through preparing reports (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A8, A13, A18, A19
B	Professional and practical skills	B1, B2, B3, B5, B6, B13, B15
C	Intellectual skills	C1, C3, C5, C6, C12, C13, C16, C17
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction. Classification of joining. Basic concepts. Economic importance of joining. Typical industrial applications, and welding symbols, Types of joining processes	4	1	2
• Soldering and brazing. Practice of soldering. Joint types and preparation. Fluxes. Heat sources and heat transfer. Different types of brazing. Braze welding, types of fixture welding.	2	2	4
• Welding. Oxy-acetylene welding, Oxyfuel Gas Cutting and Plasma Arc Cutting, arc welding, resistance welding, spot welding, electron beam welding, thermite welding, MIG< TIG, and MAG etc. Practice, joint design and preparation. Filler materials	4	3	4
• Basic science of joining processes. Sources of heat energy, the flame, the electric arc, chemical reactions during welding, oxidation reaction, and protection of weld pool with fluxes or gases. Theory of distortion.	2	2	3
• Metallurgy of welding. Microstructure changes during welding, the effect of heat on metals. Pre-treatment and post-treatment of welds. Behavior of ferrous and nonferrous metals. Fracture of welds, Design of welding joining	3	2	3
• Inspections and tests of welds and joints. Mechanical testing. Non-destructive testing. Weld defects.	2	1	3
• Adhesives. Contact adhesives. Polyester, polyamide, and polyurethane melt adhesives. Toughened acrylic and epoxy adhesives. Silicone adhesives. Mechanical properties and fracture mechanics. Joint design.	4	1	4
• Joining of ceramics. Metal/ceramic joining and ceramic/ceramic joining. Thermo-chemical considerations.	4	1	4
• Diffusion bonding. Brazing methods. Joint design	3	1	1
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory					Researches	Modeling	Experimental		Written Exam	Practical Exam	Quizzes	Term Paper	Assignment			
Knowledge & Understanding	a1	1	1	1	1		1					1	1			1	1	1	1	1			
	a2	1	1	1	1	1	1					1	1			1	1	1	1	1			
	a3	1	1	1	1	1	1					1	1			1	1	1	1	1			
	a4	1	1	1	1	1	1					1	1			1	1	1	1	1			
	a5	1	1	1	1	1	1					1	1			1	1	1	1	1			
	a6	1	1	1	1	1	1					1	1			1	1	1	1	1			
	a7	1	1	1	1	1	1					1	1			1	1	1	1	1			
	a8	1	1	1	1	1	1					1	1			1	1	1	1	1			
	a9	1	1	1	1	1	1					1	1			1	1	1	1	1			
Intellectual Skills	b1	1	1	1	1	1	1						1			1	1	1		1			
	b2	1	1	1	1	1	1					1	1			1	1	1	1	1			
	b3	1	1	1	1		1					1	1			1	1	1	1	1			
	b4	1	1	1	1		1					1	1			1	1	1	1	1			
Applied Prof. Skills	c1	1	1	1	1		1					1				1	1	1		1			
	c2	1	1	1	1	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	1			
General Tran. Skills	d1			1		1	1					1					1						
	d2		1	1								1											
	d3			1								1											
	d4		1	1		1	1					1	1						1				

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks) (each /2)	8
	Reports	Two reports per semester (each /2)	4
	Assignments	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Lecture notes and handouts

6-2 Required books

De Gamo E. P. , Black J.T. & Rosher R. A. , (2004)"Material and Processes in Manufacturing", Macmilan Publisher Co. .

Smith F. J. , " Fundamental of Fabrication and Welding Engineering", 2002.

Milner D. R. , & Apps R. L. " Introduction to Welding and Brazing", Pergamon Press 2001.

6-3 Recommended books:

Modern Welding Technology, Howard, Scott Helzer, November 10, 2004

6-4 Periodicals, Web sites, etc.: None

[http://www. Matsci.com](http://www.Matsci.com) (last accession November 30,2018)

<http://www. Homework- help- secrets.com/atomic-structure.html>(last accession November 30,2018)

<http://www.totalmateria.com/Article12.htm>(last accession November 30,2018)

<https://waterwelders.com/smoothest-path-to-an-underwater-welding-career/>(last accession November 30,2018)

7- Facilities required for teaching and learning:

1. Lecture room

2. Computer , data show
3. Welding workshop.
4. Mechanical testing lab.

Course coordinator:	Dr. Ibrahim Sabry
Head of the Department:	Prof. Dr. Nabil Gadallah
Date:	September 2018

Course Specifications

MNFN322 Computer Numerical Control (CNC)

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: December 2018

B - Basic Information

Title: Computer Numerical Control (CNC)	Code: MNFN322	Year/level: Senior 1, first Semester
Teaching Hours	Credit Hours: 3	Lectures: 2
	Pre-requisite:	Tutorial: 1 Practical: 2
		MNFN213, MNFN121

C - Professional Information

1 – Course Learning Objectives:

The aim of this course is to introduce the students to Computer Numerically Control (CNC) using advanced cycles, thus it is important to have previous knowledge of CNC programming using basic codes before taking this course.

The course aims to provide the ability of using CNC-machines (MILLING and TURNING machines) starting from writing of the part program up to the simulation of the program using special software and production of the part using CNC machines.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Define Computer Numerical Control (CNC). (A1, A8, A12, A13, A15, A16, A21, A22, A23)
- a2- Review the basic codes of CNC programming. (A1, A13, A15, A22)
- a3- Recognize the difference between using the basic G&M codes and the using of CNC programming cycles. (A1, A12, A15, A22)
- a4- Recognize the optimization concept in part programming to reduce the manufacturing time. (A13, A15)
- a5- Recognize the optimal application of each cycle and code in the programming process. (A13, A15)
- a6- Recognize the different components of milling and turning CNC machines. (A8, A15, A22)
- a7- Recognize the importance of using simulation software to verify the part programs. (A15)

b - Intellectual skills:

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

- b1- Create part programs using cycles and codes. (B1, B3)
- b2- Select the suitable tool for each manufacturing feature. (B18)
- b3- Select the correct and optimal tool path for each manufacturing feature. (B2, B3)
- b4- Choose the recommended cutting conditions for each manufacturing step according to the accuracy and surface finish of the machined part. (B18)

c - Professional and practical skills:

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

- c1- Operate CNC machines (MILLING and TURNING machines) using different modes like edit, automatic, reference, jog.....etc.). (C5, C14, C15, C17, C18)
- c2- Practice the measuring of tool length offset and zero offset. (C5, C18)
- c3- Write a G-code on the software, test and debug it of errors. (C5, C14, C17)
- c4- Simulate the program on the 3-D view and check if it matches the required work-piece. (C14)
- c5- Practice programming the machine with the G-code. (C15)

d - General and transferable skills:

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

- d1-Written communication. (D3)
- d2-Effectively manage tasks, time and resources. (D6)
- d3-Develop teamwork skills to help achieve more than what could ever be achieved individually. (D1)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A8, A12, A13, A15, A16, A21, A22, A23
B	Intellectual skills	B1, B2, B3, B18
C	Professional and practical skills	C5, C14, C15, C17, C18
D	General and transferable skills	D1, D3, D6

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Definition and applications of Computer Numerical Control (CNC)	1	1	3
• Review on Basic codes of G&M code	2	1	3
• Rectangular and circular pocket programming	2	1	1
• Centering and Deep hole drilling cycles and manufacturing of row of holes	1	1	3
• Definition of different strategies of external and internal turning	4	1	3
• Definition of local coordinate system	2	1	1
• Grooving cycle in turning	2	1	1
• Reaming and Tapping cycles	2	1	2
• Scale, Mirror and polar techniques	4	2	3
• Threading cycle in turning	2	1	2
• Axis rotation techniques	2	1	2
• Introduction to parametric programming	2	1	3
• Revision	2	1	1
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes(every 3 weeks)2 degree for each one	8
	Reports	One report per semester	4
	Assignment	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

Lecture notes.

6-2 Required books:

Software manuals.

6-3 Recommended books:

James V. Valentino, Ed V. Goldenberg and [AAA Predator](#), 2012, Introduction to Computer Numerical Control, 5th Edition.

6-4 Periodicals, Web sites, etc.

- <http://www.cncci.com/resources/articles/what%20is%20cnc.htm> (Last accessed November 15, 2018)
- http://www.ehow.com/how-does_5007907_cnc-machines-work.html (Last accessed November 15, 2018)
- <http://www.cnccookbook.com/CCNCNCCodeCourse.htm> (Last accessed November 15, 2018)

7- Facilities required for teaching and learning:

- Laboratory equipped with computer, Data show and white board.
- Laboratory equipped with CNC turning and Milling Machines
- Laboratory equipped with simulation software.

Course coordinator:

Dr. Eatemad Hosny

Head of the Department:

Prof. Dr. Nabil Gadalla

Date:

December 2018

Course Specification

MNFN323: Computer Aided Design

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic information

Title: Computer Aided Design **Code:** MNFN323 **Level:** Senior, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 1 **Practical:** 2
Pre-requisite: MNFN212

C - Professional information

1 – Course Learning Objectives:

A study of this course will enable the student to:
Recognize the General Principles of Computer Aided Design.
Learn the basics of regulation of Numerical Techniques for CAD
Learn the Principles of Computer Graphics
Understand different Geometric, surface and solid Modeling
Understand different Database Management Systems
Learn the Finite Element Method and Elastic Stress Analysis by the Finite Element Method
Learn the Design Optimization

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1- CAD and the CIMS, CAD and Traditional Design, Essential Hardware Requirements for CAD, General Procedure for Engineering Design and Engineering Analysis.[A1],[A13],
- a2- Numerical Techniques for CAD. [A1]
- a3- Principles of Computer Graphics: Mathematical Formulations for Graphics, Basic Curve-Fitting Techniques, Algorithms for Raster-Scan Graphics, Algorithms for Scan Conversion, Two-Dimensional Transformations, Three-Dimensional Transformation. .[A1], [A4], [A8]
- a4- Computer Graphics and Design: Geometric Modeling, Surface Modeling, Solid Modeling, Viewing in Three-Dimensions, Principles of Projections, Mathematics of Projections, Hidden Line/Surface Removal Algorithms, Geometric Properties of Graphics Models, Computer Simulation and Animation, Windows, Viewports, and Viewing Transformations.[A8], [A14], [A15]
- a5- The Design Databases: Database Management Systems, Data Models, Design Databases, Geometric Databases for Two-Dimensional Objects, Geometric Databases for Three- Dimensional Objects, and the IGES Standard. [A12], [A14], [A15]
- a6- The Finite Element Method: The Concept of Discretization, Application of the Finite Element Method in Engineering Analysis, Steps in the Finite Element Method, Automatic Mesh Generation, Integration of CAD and Finite Element Analysis. [A2], [A17], [A18]
- a7-The Stress Analysis by the Finite Element Method: Review of Basic Formulations in Linear Elasticity Theory, finite Element Formulation, One-Dimensional Stress Analysis of Solids, Two-Dimensional Stress Analysis of Solids (Plane Stress Case) and General-Purpose Finite Element Programs. [A1], [A17], [A18]

B - Intellectual skills

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

- b1- Choose the appropriate Procedure for Engineering Design.[B1],[B2],[B11]
- b2- Choose the appropriate Formulations for Graphics. [B1].
- b3- Choose the appropriate Geometric, Surface and Solid Modeling. [B1],[B5],[B8]
- b4- Choose the appropriate Finite Element Programs. [B1], [B13],[B15]
- b5- Choose the appropriate Design Optimization. [B1], [B11],

C - Professional and practical skills

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

- c1- Elaborate a small Design project with Finite Element Program.[C1]
c2- Develop simple and effective computer programs to optimize the Design project. [C2]

D - General and transferable skills

The graduates of the engineering programs should be able to:

- d1- Demonstrate efficient IT capabilities.[D4]
d2- Search for information and engage in life-long self-learning discipline.[D5]

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	1, 2, 4, 8, 12, 13, 14, 15, 17, 18
B	Intellectual skills	1, 2, 5, 8, 11,13,15
C	Professional and practical skills	1, 2
D	General and transferable skills	4,5

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
CHAPTER 1: An Overview of Computer-Aided Design and Analysis	2	1	2
CHAPTER 2: Review of Numerical Techniques for CAD	4	2	4
CHAPTER 3: Principles of Computer Graphics	4	2	4
CHAPTER 4: Computer Graphics and Design	4	2	4
CHAPTER 5: Overview of the Finite Element Method	4	2	4
CHAPTER 6: Elastic Stress Analysis by the Finite Element Method	5	2	5
CHAPTER 7: Design Optimization	5	3	5
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lecture	Presentations	Discussions & Debates	Tutorials	Problem Solving	Laboratory & Experiments			Researches and Projects	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1		1			1				1		1	1				
	a2	1			1									1		1	1	1			
	a3	1			1									1		1	1	1			
	a4	1	1	1	1	1	1			1				1		1	1	1			
	a5	1					1							1	1	1	1	1			
	a6	1								1							1	1			
	a7	1		1	1	1				1	1						1				
Intellectual Skills	b1	1			1									1		1		1			
	b2	1			1	1								1		1	1	1			
	b3	1	1	1	1		1			1				1	1		1				
	b4	1	1		1		1			1				1	1	1	1	1			
	b5	1	1		1		1			1				1	1	1	1	1			
Applied Professional Skills	c1	1	1		1	1	1							1	1	1	1	1			
	c2	1			1									1		1	1	1			
General Transferable Skills	d1			1		1				1							1				
	d2		1	1						1	1						1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-weekly	20 points
Mid-Term Exam	Eighth week	20 points
Practical Exam	Fifteenth Week	20 Points
Written Exam	Sixteenth week	40 points
Total		100 points

6- List of references:

6-1 Course notes:

Lecture notes prepared by the instructor

6-2 Required books:

Tai-Ran Hsu, and Dipendra K. Sinha, Computer Aided Design: An integrated Approach, New York: West Publishing Company, 1992.

7- Facilities required for teaching and learning:

- Software for Graphical Design (Inventor – Pro-Engineering – Solid-work – Solid-Edge, ...)
- Data Show and Computer Lab.

Course coordinator:

Prof. Dr. Nabil Gadallah

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



COURSE SPECIFICATION MNFN324: ADVANCED COMPOSITE MATERIAL

A- Affiliation

Relevant program:	Manufacturing Engineering & Production Technology
Department offering the program:	Mechanical Engineering Department.
Department offering the course:	Mechanical Engineering Department
Date of specifications approval:	November, 2018

B - Basic Information

Title: Advanced Composite Material	Code: MNFN324	Year/level: 3 rd Level / 2 nd Term
Credit Hours: 3	Lectures: 2	Tutorial: 1 Practical: 2
	Pre-requisite: MNFN122	

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to recognize the basic concepts and theory of advanced materials technology. He should be able to deal with the material selections, composite materials features and drawbacks and composite processing and fabrications

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1- Engineering materials and composite materials.(A3, A8, A12)
- a2- Material selections for different applications. (A3, A8,)
- a3- New methods for composite processing and fabrication.(A3, A8, A12,)
- a4- Polymer matrix composite constituents for low temperature applications.(A3, A8, A12, A13)

B - Intellectual skills

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

- b1- Design for manufacturing and product development. (B17, B18)
- b2- Choose the most suitable metal substitute for structural application.(B2, B3)
- b3- Design simple composite architecture MMC, CMC, and PMC.(B2, B3, B7)
- b4- Use the principles of composite architecture to analyze different material properties. (B12, B18)

C - Professional and practical skills

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

- c1- Manufacture different laminated composite related wood, polymer or metal.(C3, C8)
- c2- Manufacture different particulate and fiber reinforced composite (C3, C8, C15)
- c3- Manufacture different FGM composite (C3, C8, C15)
- c4- Collect and record data and information related to composite manufacturing.(C5, C15, C19)
- c5- Study failure mode and effects analysis (FMEA). (C5, C17)

D - General and transferable skills

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

- d1- collect, and categorize ideas and information in a predictable and standard format.(D7)
- d2- identify novel and/or original perspectives on the subject.(D9)
- d3- summarize key points from taken from a variety of standard sources.(D3,D8)
- d4- Present finding of scientific research in seminars and workshops.(D3, D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A8, A12, A13
B	Intellectual skills	B2, B3, B7, B12, B17, B18
C	Professional and practical skills	C3, C5, C8, C15, C17, C19
D	General and transferable skills	D3, D4, D7, D8, D9

3 – Contents:

Topic	Lecture hours	Tutorial hours	Practical hours
1- Engineering materials (Types and applications)	2	1	
2- Introduction to composite materials	3	1	
3- Particulate reinforcing composites	4	2	4
4- Fibrous reinforced composites	4	3	5
5- Structural composites	2	1	4
6- Polymeric matrix composite materials	4	2	5
7- Ceramic matrix composite materials	2	1	5
8- Metal matrix composite materials	2	1	5
9- Manufacturing techniques	3	1	
10-Product development	2	1	
Total hours	28	14	28

Topics Covered in the Practical Part of the Course (practical course content):

	Topic	Practical Sessions Hours
1	Wood Work /Wood Polymer Composite	5
2	Man-made MMC -Laminated Composite Processing	5
3	Man-made MMC-Particulate Reinforced Composite	5
4	Man-made MMC- Fiber Reinforced Composite	5
5	Man-made CM Composite [DIMOX]	5
6	Man-made FGM-textile PM Composite	5

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lecture	Presentations & Discussions	Tutorials	Problem solving	Laboratory					Modeling	Self-learning	Experimental				Class Works	Quizzes	Reports	Mid-Term Exam	Practical Exam
Knowledge & Understanding	a1	1		1		1						1				1	1		1	1	1
	a2	1		1												1	1		1		1
	a3	1		1		1						1				1	1		1	1	1
	a4	1		1		1						1				1	1			1	1
Intellectual Skills	b1	1		1												1	1		1		1
	b2	1		1												1	1		1		1
	b3	1		1		1						1				1	1			1	1
	b4	1		1		1						1				1	1			1	1
Applied Prof. Skills	c1	1		1		1						1							1	1	
	c2	1		1		1						1							1	1	
	c3	1		1		1						1								1	
	c4	1		1													1				1
	c5	1		1													1				1
General Tran. Skills	d1	1		1							1					1			1		
	d2	1		1							1					1			1		
	d3	1		1							1					1					1
	d4	1		1							1					1					

5- Students' Assessment Methods:		
Tools	Time schedule	Grading
Assignments	Weekly	20
Mid-term exam	Week 8	20
Practical Exam	Week 15	20
Final exam	Week 16	40
	Total	100

6- List of References

6-1 Course notes

Lecture notes and handouts

6-2 Required books

- Sanjay K. Mazumdar, Composite Manufacturing, Materials Product And Process Engineering, CRS press LLC.
- William D. Callister, Jr., and David G. Rethwisch "Materials Science and Engineering, An Introduction" Eighth Edition, John Wiley & Sons, Inc.

6-3 Periodicals, Web sites, etc.: Non

7- Facilities Required for Teaching and Learning

Class room, Laboratory and Workshop

Course Coordinator:

Dr. Maher Khalifa

Head of the Department:

Prof.Dr. Nabil Gad Allaf

Date:

November 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN325: Modern Manufacturing Methods

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: Modern Manufacturing Methods
Credit Hours: 3

Code: MNFN325 **Level:** Senior 2, First Semester
Lectures: 2 **Tutorial/Exercise:** 1 **Practical:** 2
Pre-requisite: MNFN221

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the construction and operation of non-traditional manufacturing and their basic elements. They should be able to operate, maintain, design, calculate and analyze the performance of machines and their basic components.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Classification and specifications of nontraditional manufacturing (A3)
- a2- Concepts and theories of thermal , chemical and mechanical methods (A1, A2).
- a3- Constrains within which the selection of suitable method is judged (A14)
- a4- Construction, operation and characteristics of the basic components of nontraditional machines(A3, A21).
- a5- Specifications and applications of each process (A15)
- a6- Computer programming related to CNC nontraditional methods (A1, A4).

b - Intellectual skills:

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

- b1- Calculate the performance and accuracy of modern manufacturing (B14)
- b2- Select the suitable modern method for production of specified product (B2, B18)
- b3- Consider the economy of different non-traditional methods (B10)
- b4- Asses engineering judgment considering safety, quality, reliability and environmental impact of different processes (B9).

c - Professional and practical skills:

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

- c1- Employ and maintain selected modern manufacturing methods (EDM, WEDM, LBM , WJM) (C14)
- c2- Prepare and present technical reports about performance on nontraditional methods (C21, C18).
- c3- Analyze suitable operating parameters for manufacturing of different materials with required quality (C16).
- c4- Use basic workshop equipment for equipment safety (C15).
- c6- Use experimental facilities to assemble and operate diverse hydraulic circuits (C17).

d - General and transferable skills:

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

- d1- Work in a team and involve in group discussion and seminars (D1, D3).
- d2- Communicate effectively and present data and results orally and in written form (D3).
- d3- Use ICT facilities in presentations (D4).
- d4- Search for information's in references and in internet (D7).
- d5- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3 A4, A14, A15, A21
B	Intellectual skills	B2, , B9, B10, B14, B18
C	Professional and practical skills	C14, 15, C16, C17, C18, C21
D	General and transferable skills	D1, D3, D4, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ The need for non-traditional methods	1		
➤ Electrical Discharge Machining (EDM), Theory and concepts	2	2	2
➤ EDM machines, construction, dielectric flushing systems	2	4	4
➤ EDM control parameters and main applications	2	2	8
➤ Wire EDM and applications	1	4	2
• Laser Beam machining, and welding applications	2		4
• Electron Beam machining, and welding applications	2		2
• Plasma Arc machining and welding application	1	2	2
➤ Electro-chemical machining (ECM), theory, concept, machines	2		
• ECM applications	1		
• Electro-chemical Turning(ECT) and applications	2	3	
• Electro-chemical boring and Electro-chemical grinding applications	1	2	
• Chemical Machining(CHM) and Photo-chemical applications	2	2	
• Ultrasonic machining(USM) and its applications	2		
➤ Water-Jet machining(WJM) and Abrasive Jet Machining(AJM)	2	2	4
➤ Hybrid-Nontraditional methods and its applications	2	4	
➤ Environmental and economic considerations when applying Non-traditional methods	1	2	
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

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

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

A M Kohail, Advanced manufacturing processes, 2013

6-3 Recommended books: Advanced machining processes, H El-Hofy, Mc Graw-Hill,2006

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

- EDM metal cutting lab.
- Periodical visits to Egyptians industrial plants

Course coordinator:

Prof. A M Kohail

Head of the Department:

Prof Nabil Gadalla

Date:

September 2018

Modern Academy for Engineering
and Technology in Maadi



Course Specification
MNFN331: Heat Transfer

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Techn. Department
Department offering the course: Manufacturing Engineering and Production Tech. Department
Date of specifications approval: April 2018

B - BASIC INFORMATION

Title: Heat Transfer	Code: MNFN331	Year/level: 4
Credit Hours:3	Lectures: 2	Tutorial: 1 Practical: 2
		Pre-requisite: MNFN214

C - PROFESSIONAL INFORMATION

1 – Course Learning Objectives

A study of this course will enable the student to:

- Have a theoretical and conceptual understanding of modes of heat transfer processes.
- Understand how these disciplines applied to the analysis of typical practical problems of interest in heat transfer.
- Establish the relationship of these disciplines to thermal system behavior.
- Develop methodologies for sizing, designing of such thermal systems behavior.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1- Genesis and of the heat transfer phenomenon(A1).
- a2- Theoretical basics needed for calculation and analyze of the physical mechanisms and conditions for steady simple and composite (slabs, cylinders and spheres)(A1,A2).
- a3- The principles and fundamentals necessary for unsteady heat transfer by conduction (A4).
- a4- The key parameters of design procedure of the heat transfer devices at different modes of operation (A4).
- a5- Heat and mass transfer analysis for evaluation of real power, heating and cooling systems performance (A3).

B - Intellectual skill

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

- b1- Develop the mathematical analysis of different heat transfer devices and their operational problems(B1).
- b2-Deduce mathematical relations describing the steady and unsteady heat transfer situations for different configurations and select the proper methods for their solution (B1, B2, B13).
- b3- Investigate ways for improving basic heat transfer devices efficiency(B5).
- b4-Evaluate the performance of real power, heating and cooling systems and deduce their characteristic parameters(B5,B16)

C - Professional and practical skills

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

- c1- Monitor and test the performance of basic and real heat transfer systems(C16).
- c2- Communicate results of the modeling process to management and other non-specialist users of engineering analyses (C7).
- c3- Use appropriate techniques, skills, and tools to identify, formulate, analyze, and solve engineering heat transfer problems (C1).
- c4- Design, and build software tools for systems analysis (C6).
- c5- Use computer software, Excel and other available programs to design, and calculate heat transfer systems size and their components (C5).

D - General and transferable skills

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4
B	Professional and practical skills	B1, B2, B5, B13, B16
C	Intellectual skills	C1, C5, C6, C7, C16
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to heat transfer Fundamentals	4	2	-
Heat transfer by conduction			
● Steady heat transfer situation for:			
- Simple and composite surfaces	4	2	4
- Cylindrical surfaces, and	4	1	4
- Spherical surfaces	2	1	2
● Heat transfer through fins and extended surfaces	4	2	4
● Unsteady heat transfer problems analysis	4	1	4
Heat transfer by convection			
● Natural convection	2	2	2
● Forced convection	2	2	2
Heat transfer by radiation	2	1	2
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of References

6.1 Course notes

Lecture notes and handouts

6.2 books

- Holman, J. P., "Heat Transfer ", McGraw Hill, New York, 9th Ed, 2002.

- Krieth F., "Principle of Heat Transfer ", C Engage learning, USA, 2011

6.3 Recommended books

- Incropera, F. P. and Dewitt, D. P., "Fund. of Heat and Mass Transfer " John Wiley and Sons, New York, 7th Ed, 2007

- Lienhard, J. H., "Heat Transfer Text Book", Phlogiston press, Cambridge, 5th Ed, 2006.

- Sukhatme, S. P., "A Textbook on Heat and Mass Transfer", Universities Press, India, 4th Ed, 2005

6.4 Periodical, Web sites, etc.

- <http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/heatra.html>

- http://www.efunda.com/formulae/heat_transfer/home/overview.cfm

- <http://www.wisc-online.com/Objects/heattransfer/default.aspx>

7- Facilities required for teaching and learning

- Heat transfer Lab.
- Computer, Data show and Computer programs
- Students are required to use own PCs

Course Coordinator:	Dr. Metwally H. Metwally
Head of the Department:	Prof. Nabil Gadallah
Date:	April 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN332: Mechanical Vibrations

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology
Department offering the course:	Manufacturing Engineering and Production Technology
Date of specifications approval:	September 2018

B - Basic Information

Title: Mechanical Vibrations	Code: MNFN332	Year/level: 3 rd level / 2 nd semester
Credit Hours: 3	Lectures: 2	Tutorial: 1 Practical: 2
	Prerequisites: MNFN115	

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand the basic concepts and theories of mechanical vibrations. The student should be able to derive mathematical models for mechanical systems with reasonable simplicity in the form of differential equations. Also, he should be able to determine the transient response and frequency response of such systems and will be able to obtain computer solutions of system responses with MATLAB. The student should be able to evaluate the technical states of machines by monitoring their conditions through vibration analysis – the most effective technique in implementing the predictive maintenance policy.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- The basic concepts of mechanical vibrations (A1, A13).
- a2- The basic classifications and specifications of vibrating systems. (A3)
- a3- Response in time and frequency domains in single and multiple degree of freedom systems (A5)
- a4- Basics of vibration control techniques. (A17)

b - Intellectual skills:

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

- b1- Deduce the equations of motion of a vibrating system, select proper assumptions. (B1, B2,B13)
- b2- Investigate the effects of different parameters on system response, function, and performance. (B1, B13)
- b3- Identify natural frequencies of systems at hand, study resonance phenomenon, and suggest solutions. (B2, B13)
- b4- Analyze and interpret data, and design experiments to detect the technical states of machines. (B14)

c - Professional and practical skills:

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

- c1- Apply knowledge of mathematics, science, design, and engineering practice to specify the motion of dynamic system and get its response.(C1)
- c2- Study the effect of different parameters on dynamic system performance. (C1, C17)
- c3- Suggest several possible solutions to improve system performance and clarify which solutions are feasible. (C2, C3, C17)
- c4- Use computational facilities and techniques, measurements and laboratory equipment to design experiments, collect, analyze, and interpret results. (C5)

d - General and transferable skills:

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

- d1- Search for information from diverse references and internet. (D3, D7, D8, D9)
- d2- Write technical reports and perform the given arrangements. (D2, D6)
- d3- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A3, A5, A13, A17
B	Professional and practical skills	B1, B2, B13, B14
C	Intellectual skills	C1, C2, C3, C5, C17
D	General and transferable skills	D2, D3, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to Mechanical vibrations and their fields of application. Basic terms and definitions.	2		
Classifications of the mechanical vibrating systems (free and forced vibrations, damped and undamped systems, single and multiple degrees of freedom, linear and nonlinear vibrations).	6		
Response of undamped and damped free vibrations of single degree of freedom systems.	8	8	
Mid-Term Exam.	-	-	-
Response of single and multiple degree of freedom systems undergoing different forcing functions.	2	6	
MATLAB simulation (single degree of freedom systems).			10
Mechanical-electrical analogies of vibrating systems.	2		
Vibration absorbing techniques.	2		
Vibration measurements.	4		6
Machine monitoring conditions using mechanical vibration measuring techniques.	2		
MATLAB simulation (multiple degree of freedom systems)			12
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method						
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning				Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	x	x	x	x	x						X					x	x	x	x		x
	a2	x	x	x	x							x					x	x	x			x
	a3	x			x	x					x	X					x	x	x			x
	a4	x	x	x	x	x						X				x	x	x	x	x	x	
Intellectual Skills	b1	x	x		x	x											x			x		x
	b2	x	x		x	x										x	x		x			x
	b3	x			x	x											x		x			x
	b4																	x			x	
Applied Professional Skills	c1	x			x	x						X					x	x	x	x	x	x
	c2	x	x	x	x	x						X				x	x	x	x	x	x	x
	c3	x			x	x						X					x			x	x	x
	C4																				x	

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN333: Production and Operation Management

A- Affiliation

Relevant programs:	Manufacturing Engineering & Production Technology BSc Program
Departments offering the programs:	Manufacturing Engineering & Production Technology Department
Department offering the course:	Manufacturing Engineering & Production Technology Department
Date of specifications approval:	December 2018

B - Basic Information

Title:	Production and Operation Management	Code:	MNFN 333	level:	4, Eith Semester
Credit Hours:	3	Lectures:	2	Tutorial:	1 Practical:
Pre- requisite: None					

C - Professional Information

1 – Course Learning Objectives

By the end of this course the students should demonstrate the knowledge and understanding of the production system, Break-even- analysis, forecasting methods, aggregate planning, materials requirement plan (MRP) and inventory plan.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1- Functions within business organizations and management processes (A7).
- a2- Productivity, competitiveness, and strategy (A5).
- a3- Concepts of decision theory, Forecasting techniques and Inventory theory (A13).
- a4- Aggregate planning and materials requirement plan (MRP) (A1).
- a5- Forecasting techniques, seasonality, accuracy and forecast control (A8).
- a6- Inventory management principles and control models (A7).
- a7- Management and business techniques and practices appropriate to engineering industries (A19, A20)

B - Intellectual skills

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

- b1- Evaluate Productivity and competitiveness of business organizations (B15).
- b2- Calculate forecast accuracy, seasonality, and control techniques (B15).
- b3- Design plans and choose the appropriate one (B15).
- b4- Analyze site locations and make decision concerning the appropriate selection of best location (B15).
- b5- Make decisions concerning appropriate plans and proper system designs (B8).
- b6- Investigate facility alternatives and make decisions concerning the selection of the proper facility (B18).
- b7- Evaluate inventory models and inventory management (B7)

C - Professional and practical skills

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

- c1- Solve the problems related to forecasting, seasonality, accuracy, and forecast control (C1).
- c2- Formulate Aggregate materials requirement plans and choose the best aggregate plan (C2).
- c3- Analyze the assignment problem and formulate schedules for manufacture (C1).
- c4- Solve the problem of determining the best site location problem and inventory control models (C1).
- c5- Design work system (C19).

D - General and transferable skills

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

- d1- Work in a team and involve in group discussion (D3, D1).
- d2- Communicate effectively and present data and results orally (D3, D9).
- d3- Use ICT facilities in presentations. (D2)
- d4- Search for information's in references and in internet (D7).

2- Course Contribution in the Program ILO's

ILO'S		Program ILO'S
A	Knowledge and understanding	A1, A5,A7 ,A8 ,A19 , A20
B	Intellectual skills	B7, B8 ,B15 , B18
C	Professional and practical skills	C1, C2 , C19
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Practical hours	Tutorial hours
Introduction	2	2	1
Production system	2	2	1
Break-even –analysis	2	2	1
Capacity planning	2	2	1
Forecasting methods	2	2	1
Production and service design	2	2	1
Inventory management	2	2	1
Inventory management	2	2	1
Material requirement planning	4	4	2
Aggregate planning	4	4	2
Scheduling and dispatching	4	4	2
Total hours	28	28	14

4 - Teaching and Learning and Assessment methods:

Course ILO's	Teaching Methods										Learning Methods		Assessment Method						
	Lecture	Presentati	Discussion	Tutorials	Problem						Modeling	Self-learning		Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1		1	1	1									1		1		1
	a2	1		1	1	1									1		1		1
	a3	1		1	1	1					1			1		1	1	1	1
	a4	1		1	1	1					1				1	1	1	1	1
	a5	1		1	1	1								1	1	1	1		1
	a6	1		1	1	1						1		1		1	1	1	1
	a7	1		1	1	1						1			1		1		1
Intellectual Skills	b1	1		1		1									1	1	1		1
	b2	1		1		1					1						1	1	1
	b3	1		1		1					1				1	1	1		1
	b4	1		1		1									1		1	1	1
	b5	1		1		1										1	1		1
	b6	1		1		1										1	1	1	1
Applied Prof. Skills	c1	1		1	1	1					1				1	1	1		1
	c2	1		1	1	1					1				1	1	1		1
	c3	1			1	1									1		1		1
	c4	1			1	1									1		1		1
General Transferable Skills	d1										1								
	d2			1							1								
	d3		1								1								
	d4			1							1					1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Practical Exam	Fifteenth week	20

Written Exam	Sixteenth week	40
Total		100

6- List of References

6-1 Course notes Lecture notes & workshop training notes

6-2 Required books

6-3 Recommended books William j. Stevenson, "Operations managements", Prentice hall, Eighth Edition, 2001.

6-4 Periodicals, Web sites etc. Non

7- Facilities Required for Teaching and Learning

- Lecture room and tutorial room.

Course Coordinator: Dr. Mohamed Saad Abdelkarim

Head of the Department: Prof. Nabil Gadallah

Date: December 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN360: Industrial Training (2)

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Eng. and Production Tech. Department
Department offering the course: Manufacturing Eng. and Production Tech. Department
Date of specifications approval: September 2018

B - Basic Information

Title: Industrial training (2) **Code:** MNFN360 **Year/level:** Senior 2, 9th semester
Credit Hours: **Lectures:** - **Tutorial:** -
 Practical: - **Total:** 60 hours
 Pre-requisite: 101 Credit+ MNFN260

C - Professional Information

1 – Course Learning Objectives:

Providing real world working environment perspective and real experience of working in industry.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding:

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

- a1- Applicability of theoretical knowledge gained during academic sessions. (A18)
- a2- Actual needs of business of the domain of specialization. (A19)

b - Intellectual skills:

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

- b1-Develop the personal attitudes to serve the society. (B11)
- b2- Develop personal contacts in the field (B4)

c - Professional and practical skills:

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

- c1- Practicing the actual production cycle (C1, C15, C18, C19)

d - General and transferable skills:

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

- d1- Presenting a report that includes all information about the training. (D3)
- d2- Presenting personal qualities. (D6).
- d3- Communicate effectively by diverse ways. (D3).
- d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A18, A19
B	Intellectual skills	B4, B11
C	Professional and practical skills	C1, C15,C18,C19
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
<ul style="list-style-type: none"> Practical industrial training for two weeks- during summer vacation at the end of the 8th semester- in a recognized industrial establishment. At the end of the training, student should submit a report with the following information: <ul style="list-style-type: none"> ✓ Profile of the industry ✓ Organization structure. ✓ Product range ✓ Processes ✓ Machines, equipment, devices. ✓ Personnel welfare scheme ✓ Details of the training undergo ✓ Projects undertaken during the training.(if any) 	10		40
Total hours	10		40

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method										
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Site Visits	Projects				Modeling & Simulation	Self-learning	Cooperative	Researches & Reports				Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1						1	1				1	1		1									
	a2						1						1		1									
Intellectual Skills	b1		1	1			1						1	1										
	b2						1							1										
Applied Professional Skills	c1						1	1							1									
General Tran. Skills	d1						1								1					1				
	d2			1			1						1			1								
	d3						1	1							1									
	d4							1				1												

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Evaluation of the foundation	Daily during the training	60
Report from student of the training	By the end of the training period	40
Total		100

6- List of references:

- 6-1 Course notes: None
- 6-2 Required books: None
- 6-3 Recommended books: None
- 6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning: None

Course coordinator:	Prof. Nabil Gadalla
Head of the Department:	Prof. Nabil Gadalla
Date:	September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN361 : Project-1

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Eng. and Production Tech. Department
Department offering the course: Manufacturing Eng. and Production Tech. Department
Date of specifications approval: September 2018

B - Basic Information

Title : Project-1 **Code:** MNFN361 **Year/level:** Senior 1 ,8th semester
Credit Hours: 3 **Lectures:**2 **Tutorial:** **Practical:**3
Pre-requisite: MNFN262

C - Professional Information

1 – Course Learning Objectives:

The project is a conclusion work. Its aim is to show the ability of student to integrate the knowledge and skills acquired during program study to perform the assigned task, identify and formulate the problem, and choose of a suitable technique to solve the problem.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Time management to carry out the assigned task. (A14, A19)

b - Intellectual skills:

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

b1- Use of knowledge and basics of mathematics and sciences appropriate to the project (B1)

b2- Compare of different techniques of solving problems and choosing the proper one to perform the task (B12).

b3- Apply of the appropriate technological means (B18).

b4- List of the assembly, disassembly, and calibration procedures (B3)

c - Professional and practical skills:

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

c1- Apply knowledge of different engineering disciplines in technological applications (C1, C2, C9)

c2- Test the function of the equipment (project) according to codes and standards and evaluate its performance (C5, C16, C18)

c3- Prepare the report of the project and a power point presentation (C12)

c4- Prepare all the technical documents and the user manual of the project (C13)

d - General and transferable skills:

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

d1- Present a report that includes all information about the project. (D3)

d2- determine technical specifications of different items of the project. (D6).

d3- Management of man power of the team work, assigning different tasks for each member to be fulfilled according to the time schedule, and different resources. (D6).

d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A14, A19
B	Intellectual skills	B1, B3, B12, B18
C	Professional and practical skills	C1, C2, C5, C9, C12, C13, C16, C18
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
<ul style="list-style-type: none"> The project requires the following steps to be carried out: <ul style="list-style-type: none"> ✓ The literature survey. ✓ Choice of the project construction based on some existing variants. ✓ Preparation of the constructional drawings of parts. ✓ Design of the most dangerous parts. ✓ Preparation of the process sheets to manufacture the parts. ✓ Assembly and testing of the project. ✓ Calibration of some parameters (if any). ✓ Preparation of the report ✓ Preparation of the presentation. 	28		42
Total hours	28		42

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method						
		Lecture	Presentations & Movies	Discussions & Tutorials	Problem solving	Site Visits	Projects		Modeling & Simulation	Self-learning	Cooperative	Researches & Reports		Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1			1	1							1							
Intellectual Skills	b1		1	1	1		1		1			1				1			
	b2		1	1	1		1		1			1				1			
	b3		1	1	1		1		1			1				1			
	b4		1	1	1		1		1			1				1			
Applied Professional Skills	c1		1		1		1	1	1			1		1					
	c2		1		1		1	1	1			1		1					
	c3		1		1		1	1	1			1		1					
	c4		1		1		1	1	1			1		1					
General Tran. Skills	d1		1	1			1					1		1		1			
	d2		1	1			1					1		1		1			
	d3		1	1			1					1		1		1			
	d4		1	1			1	1				1		1		1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Year Work	During the semester	40
Evaluation of the Project	End of the term	60
Total		100

6- List of references:

6-1 Course notes: None

6-2 Required books: None

6-3 Recommended books: None

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

7- Facilities required for teaching and learning: Non

Course coordinator:	Prof. Nabil Gadalla
Head of the Department:	Prof. Nabil Gadalla
Date:	September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN411: Quality Control and Quality Management

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology BSc program
Department offering the program: Manufacturing Engineering & Production Technology Dept.
Department offering the course: Manufacturing Engineering & Production Technology Dept.
Date of specifications approval: December 2018

B - Basic Information

Title: Quality Control and Quality Management **Code:** MNFN411 **level:** 3 ,Nineth semester
Teaching Hours: **Credit::** 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: MTHN105

C - Professional Information

1 – Course Learning Objectives

The main objective of this course is to provide the students with the knowledge of statistical quality control, acceptance sampling techniques, quality improvement methods and total quality management in addition to ISO quality system.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1 - The fundamental of statistical quality control. (A1)
- a2 - The methods, and plans used for acceptance sampling. (A2)
- a3 - The concept of quality improvement (A14).
- a4 - Total quality management implementation (A20).
- a5 - ISO quality systems (A6, A21, A24).

B - Intellectual skills

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

- b1 - Develop quality improvement techniques for production lines (B12, B17).
- b2 - Analyze quality control charts (B4).
- b3 - Select appropriate sampling plans and sampling system for production line (B5).
- b4 - Apply the principles of statistics and probability for quality analysis (B11).
- b5 - Apply ISO quality systems. (B8), (B10)

C - Professional and practical skills

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

- c1 - Employ computer statistical packages for quality control (C17).
- c2 - Integrate knowledge of statistics with quality charts (C10).

D - General and transferable skills

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

- d1 - Present data and results in written and graphical form (D3).
- d2 - Search for information in references and internet (D7).
- d3 - Communicate with others, and work in team(D1).

2- Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A6,A14, A20, A21, A24
B Intellectual skills	B4,B5, B8, B10, B11, B12, B17
C Professional and practical skills	C10,C17
D General and transferable skills	D1, D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to quality	2	1	2
• Fundamentals of statistical quality control	2	1	2
• Applications of probability distributions for Q. C.	2	1	2
• Control charts for variables	2	1	2
• Fundamentals of statistics and quality	2	1	2
• Control charts for variables	2	1	2
• Control charts for attributes	2	1	2
• Lot-by-lot acceptance sampling	2	1	2
• Acceptance sampling plans	2	1	2
• Reliability and quality	2	1	2
• Quality cost	2	1	2
• Quality improvement techniques	2	1	2
• ISO quality systems	2	1	2
• Total quality management TQM	2	1	2
Total hours	28	14	28

4 - Teaching and Learning Methods

Course ILO's		Teaching Methods								Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory				Modeling	Self-learning	Experimental				Class Works	Quizzes	Reports	Mid- Term Exam	Practical Exam
Knowledge & Understanding	a1	1	1	1													1		1		1
	a2	1			1	1	1				1						1		1		1
	a3	1	1	1	1	1	1				1						1	1	1	1	1
	a4	1	1	1													1		1		1
	a5	1		1	1	1	1				1						1		1		1
Intellectual Skills	b1	1	1		1	1	1				1						1		1		1
	b2	1			1	1	1				1						1		1		1
	b3	1	1		1	1	1				1						1		1		1
	b4	1	1	1		1											1		1		1
	b5	1	1	1		1											1		1		1
Applied Prof. Skills	c1	1	1		1	1	1				1						1	1	1	1	1
	c2	1			1	1	1				1						1	1	1	1	1
General. Skills	d1	1	1	1	1	1	1												1		1
	d2	1	1																1		1
	d3	1	1																1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of References

6-1 Course notes

Lecture Notes and practical book.

6-2 Required books: None

6-3 Recommended books:

Dale Bester field, "Quality Control", Prentice Hall, 1998.

6-4 Periodicals, Web sites, etc.: None

7- Facilities Required for Teaching and Learning

- Computer lab equipped with required software, lecture and exercise rooms

Course Coordinator: Dr. Mohamed Saad Abdelkarim

Head of the Department: Prof. Nabil Gadalla.

Date: December 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN421 Computer Aided Manufacturing

A- Affiliation

Relevant program	Manufacturing Eng. and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	December 2018

B - Basic Information

Title: Computer Aided Manuf.	Code: MNFN421	Level: Senior 2, First Semester
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:-- Practical: 2
	Pre-requisite: MNFN322	

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the basics of computer aided manufacturing and computer numerical control, the advanced techniques of part programming in terms of various steps needed to be taken for completing a successful CNC part program, use of special computer packages in computer aided manufacturing (wincts and wincam), Illustrating the potential applications of computer aided manufacturing in a variety of production engineering applications, and recognition of the need of using computers as a tool in the manufacture engineering.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Identification the basics of computer aided manufacturing. (A1, A4, A13).
- a2- The advanced techniques of computer numerical control. (A8, A12, A15, A22, A21)
- a3- The use of parameters in part programs. (A4)
- a4- The need for group technology (GT). (A5)
- a5- The concept of computer aided process planning. (A15)
- a6- The different approaches used in computer aided process planning CAPP application (A15)
- a7- The concept of computer aided part programming using the available computer package.(A15)
- a8- The methods utilized for entering geometric information into wincam software (A15)
- a9- The techniques utilized in developing CAPP systems (A15)

b - Intellectual skills:

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

- b1- Program parts using polar coordinates. (B1, B2, B13)
- b2- Use of parameters in developing part programs.(B1, B13,B17)
- b3- Develop programs using looping such as IF and DO. (B1, B13, B17)
- b4- Use subroutines and special canned cycles that can utilize the part geometry information directly to create complex part programs. (B17, B3, B5)
- b5- Use geometric transformation as mirroring and scaling to exploit the symmetry in part geometry.(B1, B13)
- b6- Appreciate the need for group technology (GT) as a mean of bringing the benefits of mass production to the relatively smaller production that is required in a majority of the mass production to the relatively smaller production that is required in a majority of the present day manufacturing industries. (B3)
- b7- Appreciate the need for computer aided process planning (CAPP) (B8)

c - Professional and practical skills:

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

- c1- Use the various tool path generation modules within wincam software through which the CNC part programs can be generated. (C1)
- c2- Write programs for machining centers as well as turning centers using wincam. (C5)
- c3- Use the available CNC machines for the manufacturing of turned and milled parts. (C17, C14)
- c4- Develop advanced part programs to manufacture different mechanical parts.(C14, C6, C5, C2)
- c5- Use the available simulation software to verify the developed part programs. (C9, C10)

d - General and transferable skills:

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

d1- Working a team work. (D1)

d2- Demonstrate efficient IT capabilities. D4)

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A1, A4, A5, A8, A12, A13, A15, A21, A22
B Intellectual skills	B1, B2, B3, B5, B8, B13, B17
C Professional and practical skills	C1, C2, C5, C6, C9, C10, C12, C14, C17
D General and transferable skills	D1, D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Fundamentals of CAM	3		0
Part programming using tool compensation (length and radius)	3		2
Canned cycles of CNC milling	3		3
Canned cycles of CNC turning	3		3
Subprogram techniques for CNC part programming	3		4
Introduction to computer Aided Part Programming	3		2
Computer Aided Part Programming of Milled parts	3		4
Computer Aided Part Programming of Turned parts	3		4
Computer Aided Process Planning	4		6
Total hours	28		28

4 - Teaching and Learning and Assessment methods:

Course ILO's	Teaching Methods										Learning Methods		Assessment Method							
	Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation		Written Exam	Practical Exam	Quizzes	Term papers	Assignments		
Knowledge & Understanding	a1	1	1	1		1					1			1		1	1			
	a2	1												1		1	1	1		
	a3	1												1		1	1	1		
	a4	1	1	1		1	1				1			1		1	1	1		
	a5	1					1							1	1	1	1	1		
	a6	1									1						1	1		
	a7	1		1		1					1						1			
	a8	1												1		1		1		
	a9	1				1								1		1	1	1		
Intellectual Skills	b1	1	1	1			1				1			1	1		1			
	b2	1	1				1				1			1	1	1	1	1		
	b3	1	1			1	1							1	1	1	1	1		
	b4	1												1		1	1	1		
	b5	1		1		1					1						1	1		
	b6	1				1									1		1	1		
	b7						1								1					
Prof. Skills	c1						1								1					
	c2			1		1					1						1			
	c3		1	1							1						1			
	c4	1	1								1						1	1		
	c5	1	1	1							1									
General Tran. Skills	d1		1	1							1						1			
	d2		1	1							1						1			

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes(every 3 weeks)2 degree for each one	8
	Reports	One report per semester	4
	Assignment	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of References

6-1 Course notes

Lecture notes & Laboratory notes

6-2 Required books

- Nanfara, F, Uccello, T and Murphy , D., The CNC workshop (A multimedia introduction to computer numerical control), Addison-Wesley Longman Inc. , 1999
- Radhakrishnan, p and subramanyan, S, CAD/CAM/CIM, New age international Ltd. Publishers, 1994
- RAO,P.N,CAD/CAM principles and applications, Tata McGraw-Hill publishing Company limited, 2004

6-3 Recommended books

- Lynch, M, 1993, Computer Numerical Control (Advanced techniques), McGraw-Hill Inc.

7- Facilities Required for Teaching and Learning

Lecture room ,

CNC laboratory

Software and local computer network

Course Coordinator: Dr. Eatemad Hosny
Head of the Department: Prof. Dr. Nabil Gadalla
Date: December 2018

Modern Academy
for Engineering and Technology in Maadi



Course Specification
MNFN422: Hydraulic Power Systems

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	December 2018

B - Basic Information

Title: Hydraulic Power System	Code: MNFN422	Level: 3 rd (Senior 2), First Semester
Credit Hours: 3	Lectures: 2	Tutorial/Exercise: 2 Practical: 1
	Pre-requisite: MNFN211	

C - Professional information

1 – Course Learning Objectives:

By the end of this course, the students should demonstrate the knowledge and understanding of the construction and operation of hydraulic power systems and their basic elements. They should be able to operate, maintain, design, calculate and analyze the performance of hydraulic power systems and their basic components.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Classification and specifications of power systems (A3, A8)
- a2- Theoretical background needed to calculate and analyze the characteristics of the hydraulic systems and their components (A1, A2).
- a3- Basic properties of hydraulic fluids and their effect on the system performance (A3)
- a4- Construction, operation and characteristics of the basic components of hydraulic power systems; pumps, valves, actuators, transmission lines and accessories (A3).
- a5- Standard symbols of hydraulic power systems (A3)
- a6- Procedures of design of the hydraulic systems using industrial elements (A4, A5)
- a7- Computer software related to hydraulic power systems design, calculation and animation (A1, A4).

b - Intellectual skills:

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

- b1- Investigate the effect of hydraulic fluid properties on the function of hydraulic power systems (B1, B13)
- b2- Deduce mathematical relations describing the steady state performance of hydraulic power systems and their elements and select the proper methods for their solution (B1, B2, B13)
- b3- Analyze the static characteristics of hydraulic power systems and their components (B5, B9, B14)
- b4- Classify and compare the different ways of hydraulic elements connection (B2, B5, B15).

c - Professional and practical skills:

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

- c1- Design, assemble, operate, test and maintain simple hydraulic system (C1, C3)
- c2- Calculate the steady state characteristics of hydraulic systems and their subsystems and basic components and (C1, C5).
- c3- Use computer software; Automation Studio, Marex and other available programs to design, calculate, simulate or animate hydraulic power systems and their components (C5).
- c4- Solve limited operational problems related to the hydraulic power systems and their basic elements (C1, C5, C6).
- c5- Use experimental facilities to visualize and investigate the cavitation phenomenon and evaluate the characteristics of typical roto-dynamic and displacement pumps (C12, C16, C17).
- c6- Use experimental facilities to assemble and operate diverse hydraulic circuits (C17).

d - General and transferable skills:

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

- d1- Work in a team and involve in group discussion and seminars (D1, D3).
- d2- Communicate effectively and present data and results orally and in written form (D3).
- d3- Use ICT facilities in presentations (D4).

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5, A8
B	Intellectual skills	B1, B2, B5, B9, B13, B14, B15
C	Professional and practical skills	C1, C3, C5, C6, C12, C16, C17
D	General and transferable skills	D1, D3, D4, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Power systems, classification, operation, and comparison.	1		
➤ Introduction to hydraulic power systems and standard symbols	1	2	1
➤ Hydraulic fluids; properties and their effect on the system performance.	2	4	1
➤ Hydraulic transmission lines and connectors	1	2	1
➤ Hydraulic pumps:		4	1
• Classification and basic mathematical relations	2		
• Gear pumps, vane pumps and piston pumps	4		
• Fixed and variable displacement pumps and pump control	2	2	1
➤ Control valves			1
• Classification and basic design	1		
• Pressure control valves (direct/pilot operated); relief valves, pressure reducers, sequence valves and accumulator charging valves	3	4	1
• Directional control valves	2	2	1
• Flow control valves	2	2	
• Check valves	1		
➤ Hydraulic actuators; cylinders, motors and rotary actuators	2	2	1
➤ Accessories; accumulators, filters, reservoirs, pressure switches,...etc	2	2	1
➤ Mini project; design and analysis of the hydraulic system for an industrial application. Analysis of the possible operational problems...	2	2	4
Total hours	28	28	14

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches & Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1	1	1	1		1	1		1		1	1	
	a2	1			1					1		1	1	1
	a3	1			1					1		1	1	1
	a4	1	1	1	1	1	1	1		1		1	1	1
	a5	1					1			1	1	1	1	1
	a6	1						1					1	1
	a7	1		1	1	1		1	1				1	
Intellectual Skills	b1	1			1					1		1		1
	b2	1			1	1				1		1	1	1
	b3	1	1	1	1		1	1		1	1		1	
	b4	1	1		1		1	1		1	1	1	1	1

Applied Professional Skills	c1	1	1		1	1	1			1	1	1	1	1
	c2	1			1					1		1	1	1
	c3	1		1		1		1	1				1	1
	c4	1			1	1					1		1	1
	c5						1				1			
	c6						1				1			
General Tran. Skills	d1			1		1		1					1	
	d2		1	1				1	1				1	
	d3	1	1					1					1	1
	d4	1	1	1				1						
	d5							1	1				1	

5- 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	Two reports per semester	4
	Assignments	3 Assignments per semester	6
	Mini project	Once per semester	4
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	60
Total			100

6- List of references:

6-1 Course notes: Non

6-2 Required books

Rabie, M. G. (2009) Fluid Power Engineering, NY: McGraw-Hill. Professional.

6-3 Recommended books: Non

- RABIE M. G. (2010) Automatic Control for Mechanical Engineers, Cairo: MAM Press, ISBN 977-17-9869-3
- Ibrahim Saleh I. (2011) Fluid Mechanics for Engineers, Cairo: Published by the author, ISBN 978-977-5092-00-7

6-4 Periodicals, Web sites, etc.

<http://www.moog.com/>, (Last accessed November 5, 2018)

<http://www.boschrexroth.com/en/xcl/>, (Last accessed November 5, 2018)

<https://www.mgacontrols.com/products/pneumatics/>, (Last accessed November 5, 2018)

<http://www.eaton.com/Eaton/index.htm>, (Last accessed November 5, 2018)

<http://www.nfpa.com/>, (Last accessed November 5, 2018)

7- Facilities required for teaching and learning:

- Fluid Power Lab.
- Computer, Data show and Computer programs; Automation studio, Marex, Rexroth hydraulic trainer, Rexroth hydraulic element animation and TK-Solver.

Course coordinator: Professor M Galal Rabie

Head of the Department: Professor Nabil Gadallah

Date: December, 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN423 Production Aids Design

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology BSc. Program
Department offering the program: Manufacturing Engineering & Production Technology Department.
Department offering the course: Manufacturing Engineering & Production Technology Department.
Date of specifications approval: September 2018

B - Basic information

Title: Production aids design **Code:** MNFN523 **level:** 4 th , Seniors 2, First semester
Credit hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: MNFN321

C - Professional Information

1 – Course Learning Objectives:

The main objectives of this course are to teach the students how to design different production aids including; cutting tools, jigs and fixtures, plastic molds, and sheet metals, forging, and drawing dies.

2 - Intended Learning Outcomes (ILOs)

A - Knowledge and understanding:

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

- a1- Definition, classification, and properties of plastic materials (A1).
- a2- Design considerations of plastic products (A4).
- a3- Plastics molding processes and its types (A1).
- a4- Design Plastic injection molds and dies of forging, deep drawing and sheet metal (A4).
- a5- Programming of CNC lathes, milling machines (A15).
- a6- Using the available software packages, in design and manufacture of molds and dies (A18).

B - Intellectual skills:

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

- b1- Evaluate plastic products and introduce the proper design molds for their molding (B1)
- b2- Select sheet metal products and introduce the proper design dies needed their cutting and/or forming (B2)
- b3- Choose metal products and introduce the proper designs of dies needed for their manufacturing by forging or deep drawing (B18).
- b4- Design the molds or dies and writing programs of for CNC milling or turning of their geometrically complicated parts (B3)

C - Professional and practical skills:

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

- c1- Design and manufacture of different dies for sheet metal, deep drawing, forging and different plastics injection molds (C1).
- c2- Solve some production problems by writing programs for CNC milling and turning (C3)

D - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A15, A18.
B	Intellectual skills	B1, B2, B3, B18.
C	Professional and practical skills	C1, C3.
D	General and transferable skills	D1, D3, D7, D9.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Cutting tools design	4	2	4
Jigs and fixtures design	2	1	2
Locating and clamping elements for jigs and fixtures.	2	1	4
Guide elements for jigs	2	1	2
Milling, turning ,welding, and grinding fixtures	4	2	4
Press tool design	2	1	1
Bending, forming and drawing dies	4	2	4
Forging die design	4	1	2
Plastic molds design	2	1	2
Materials for dies ,Material selection	1	1	2
Process planning and estimation for production aids	1	1	1
Total	28	14	28

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	Three Quizzes (every 3 weeks) (each /2)	8
	Reports	Two reports per semester (each /2)	4
	Assignments	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Lecture notes: Manufacturing Technology (3)(2010), by M. Merdan, Ph. D.

Lecture notes: CNC part programming, (2010) by A. Affi, Ph. D.

6-2 Essential books (text books): Jig and fixture handbook, (1995) third edition.

6-3 Recommended books: G.R. NAGPAL, " Tool Engineering & Design", Khanna publisher, 2005.

6-4 Periodicals, Web sites, etc.

<https://www.quora.com/What-is-the-difference-between-a-jig-and-a-fixture>(last accession November 30,2018)

<http://engineeringhut.blogspot.com/2010/11/jigs-and-fixtures.html>(last accession November 30,2018) (last accession November 30,2018)

<https://www.accessengineeringlibrary.com/browse/handbook-of-die-design-second-edition>(last accession November 30,2018)

6-5 Technological Tables: Design of Jigs, Fixtures and Press Tools, Dr. M Hasan ,2013.

7- Facilities required for teaching and learning:

Lecture Room, CNC Lab

Course coordinator:

Dr. Ibrahim Sabry

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN424: Industrial Thermal Systems

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology
Department offering the course:	Manufacturing Engineering and Production Technology
Date of specifications approval:	September 2018

B - Basic Information

Title: Industrial Thermal Systems	Code: MNFN424	Year/level: 4 th level / 2 nd semester
Credit Hours: 3	Lectures: 2	Tutorial: 1 Practical: 2
	Prerequisites: MNFN214	

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand the basic concepts, notations, and specifications of: furnaces, heating, refrigeration, and air conditioning systems. The students should be able to choose the appropriate furnaces, refrigeration and air conditioning systems in different industrial applications. They should also be able to modify the components of these systems. Besides, operating and maintaining them properly.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Construction and principles of operation of different melting furnaces, heat treatment bathes, heating boilers, thermal insulators, and refrigeration and air conditioning systems. (A8, A12, A13)
- a2- Basic notations and characteristics of furnaces, boilers, refrigeration and air conditioning systems. (A4)
- a3- Engineering design principles and maintenance operations of furnaces, boilers, refrigeration and air conditioning systems. (A5, A18, A19, A20)

b - Intellectual skills:

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

- b1- Select appropriate solutions for engineering problems related to melting furnaces, boilers, refrigeration and air conditioning systems. (B2, B3)
- b2- Investigate the effects of different parameters on the function and performance of the studied industrial thermal systems. (B1, B6, B13)
- b3- Investigate and analyze the failures of components of the studied industrial thermal systems and suggest solutions. (B2, B6, B17)

c - Professional and practical skills:

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

- c1- Apply thermodynamic and heat transfer relations to specify and solve the engineering problems related to the studied industrial thermal systems. (C1)
- c2- Evaluate and analyze the basic parts and components of the studied industrial thermal systems. (C1, C17).
- c3- Suggest possible solutions to improve the performance of items of the studied industrial thermal systems. (C2, C3, C17)

d - General and transferable skills:

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

- d1- Search for information from diverse references and internet. (D3, D7, D8, D9)
- d2- Write technical reports and perform the given arrangements. (D2, D6)
- d3- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A4, A5, A8, A12, A13, A18, A19, A20
B	Professional and practical skills	B1, B2, B3, B6, B13, B17
C	Intellectual skills	C1, C2, C3, C17
D	General and transferable skills	D2, D3, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Refrigeration (definition, heat pumps and criteria of its evaluation, classifications of refrigerating systems)	4		
Vapor compression and gas compression refrigerating systems and their operating cycles and basic components and control.	4	4	6
Operating cycles of vapor absorption refrigerating cycles and their basic components and control.	2	2	2
Air conditioning (definition and basic concepts, Psychrometry of air conditioning systems)	2	4	4
Mid-Term exam	-	-	-
Classification of air conditioning systems	2		
The basic components of different air conditioning systems.	4	2	6
Control in air conditioning systems	4		4
Heating boilers: operating principles, types, working pressures and temperatures, main components, safety issues, best practices for efficient operation, boiler control, boiler performance evaluation.	2		4
Industrial furnaces (Classifications, types of fuel used and their combustion systems) and their evaluations.	4	2	2
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method						
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving					Modeling	Self-learning			Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	x	x	x	x	x						x			x	x	x	x	x	x
	a2	x	x	x														x		x
	a3	x			x	x					x	x				x	x	x		x
Intellectual Skills	b1	x	x		x	x										x		x		x
	b2	x	x		x	x									x	x		x		x
	b3	x			x	x										x		x		x
Applied Prof Skills	c1	x			x	x						x				x	x	x	x	x
	c2	x	x	x	x	x						x			x	x	x	x	x	x
	c3	x			x	x						x				x		x	x	x
General Tran.	d1											x			x					
	d2	x	x	x	x	x						x			x			x		x
	d3	x	x	x	x	x						x			x					

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Semester Work	Class Work	Bi-Weekly	5
	Assignments	Every three weeks	5
	Quizzes	3 Times	10
Mid-Term Exam		7-th Week	20
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes:

Lecture notes: Gaafar A.H. "Industrial Thermal Systems", Printed lectures, Modern Academy of Engineering and Technology.

6-2 Required books

Philip F., Jairo M. "Manufacturing processes and Systems (9th Edition)", John Willey & Sons, 1997, ISBN 978-0-471-04741-4.

6-3 Recommended books: None

6-4 Web sites:

<https://www.google.com.eg/#q=websites+of+boilers>

<https://www.google.com.eg/#q=websites+of+refrigeration>

<https://www.google.com.eg/#q=websites+of+air+conditioning&start=10>

<https://www.google.com.eg/#q=websites+of+boilers>

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

<https://faculty.psau.edu.sa/.../doc-4-ppt-5f41caa07641b4b19aaf61278a0>

7- Facilities required for teaching and learning:

- Lab of industrial thermal systems
- Data show

Course coordinator:

Assoc. Prof. Gaafar Ahmed Hussein

Head of the Department:

Prof. Nabil Gadalla

Date:

December, 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN430 Advanced Forming Techniques.

A- Affiliation

Relevant program:	Mechanical Design and Production Technology BSc Program
Department offering the program:	Mechanical Design and Production Technology Department
Department offering the course:	Mechanical Design and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Advanced Forming Techniques	Code: MNFN430	Year/level: 4 th, Second Semester
Credit Hours: 3	Lectures: 2	Tutorial:1 Practical: 2
	Pre-requisite: MNFN001	

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of conventional and advanced metal forming processes and machines. The student should be able to select or design the process suitable to the material of the product and its configuration. The course covers a review of conventional forming processes such as rolling, forging, drawing and extrusion as well as advanced metal forming processes like superplastic forming, thermoforming, vacuum forming, high energy and high rate forming, hydroforming and explosive forming.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Classification of different types of metal forming processes and machines. (A3, A21)
- a2- The strong relationships between material properties and metal forming process. (A8)
- a3- The concepts of conventional and advanced metal forming processes. (A8, A12)
- a4- The applications and limitations of different metal forming processes. (A14)
- a5- Advantages and disadvantages and the differences between metal forming processes and machines. (A4)
- a6- The measure of success or failure of processes, machines or systems. (A13)

b - Intellectual skills:

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

- b1- Analyze problems in the behavior of materials under conditions of compressive flow and ductile or brittle fracture (B4, B15)
- b2- Formulate a forming process related problem for simulation and analysis. (B1, B8)
- b3- Evaluate the results of a forming related simulation and analysis. (B15, B14)
- b4- Identify defects associated with each metal forming process. (B18)

c - Professional and practical skills:

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

- c1- Apply the process design considerations for metal forming processes such as rolling, forging, extrusion, thermoforming, high energy and rate forming and superplastic forming. (C2, C3)
- c2- Evaluate results according to the theoretical aspects of these processes. (C6)
- c3- Calculate and practice the working methods of each forming process. (C16)
- c4- Solve operational problems related to the forming processes. (C6, C20)
- c5- Use experimental facilities to visualize and investigate the different aspects of conventional and advanced forming processes and to determine the required load or power. (C16, C17)

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A8, A12, A13, A14, A21
B	Intellectual skills	B1, B4, B8, B14, B15, B18
C	Professional and practical skills	C2, C3, C6, C16, C17, C20
D	General and transferable skills	D1, D3, D7

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Introduction to metal forming processes and machines, Mechanism of dislocation motion, flow rule, Effect of Inhomogeneity, Temperature and Strain-Rate Dependence.	2		2
➤ Conventional metal forming and Classification	2		2
• Rolling -- process and machines	2		2
• Forging -- process and machines	2	2	2
• Drawing -- process and machines	2	2	2
• Extrusion -- process and machines	2		1
➤ High energy forming- process and machines	1		1
• High energy forming- theoretical aspects	2		2
➤ High rate forming- process and machines	1	2	2
• High rate forming- theoretical aspects	2		2
➤ Stretch Forming- process and machines	1	2	2
• Stretch Forming- theoretical aspects	2		2
➤ Explosive forming- process and machines	2	2	2
➤ Super plastic forming- theory, process and machines	2	2	2
➤ Hydroforming- theory, process and machines	2	2	1
➤ Special rolling Techniques- theory, process and machines	1		1
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method						
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving					Modeling	Self-learning				Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam
Knowledge & Understanding	a1	1			1											1		1		1
	a2	1			1											1		1		1
	a3	1			1											1		1		1
	a4	1			1											1		1		1
	a5	1			1											1				1
	a6	1			1															1
Intellectual Skills	b1	1			1	1										1		1		1
	b2	1			1	1										1		1		1
	b3	1				1				1						1		1		1
	b4	1				1														1
Applied Prof. Skills	c1	1			1											1		1	1	
	c2	1			1													1		1
	c3	1														1		1		1
	c4	1																1		1

	c5	1																		1	
General Trans Skills	d1	1			1							1									
	d2	1			1							1									1
	d3	1			1							1									
	d4	1										1									

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-Term Exam		7-th Week	20
Semester Work	Quizzes	4 Quizzes (every 3 weeks) (each /2)	8
	Reports	Two reports per semester (2)	4
	Assignments	Bi-Weekly	8
Practical Exam		Fifteenth week	20
Written Exam		Sixteenth week	40
		Total	100

6- List of references:

6-1 Course notes: Advanced Forming Techniques (Lecture Notes).

6-2 Required books

Klpakjian, Serope and Steven R. Schmidt (2007) "Manufacturing Engineering and Technology". Prentice –Hall Inc.
Metal forming mechanics and metallurgy ,third edition, Robert M. caddell.

6-3 Recommended books: Extrusion: The Definitive Processing Guide, Harold F. Giles, Jr, 2010

6-4 Periodicals, Web sites, etc.

<https://www.springer.com/us/book/9783540698449> (last accession November 30,2018)

<https://nptel.ac.in/courses/112106153/> (last accession November 30,2018)

http://thelibraryofmanufacturing.com/metal_rolling.html (last accession November 30,2018)

<https://www.slideshare.net/SivaKumar1226/rolling-process-82171623> (last accession November 30,2018)

7- Facilities required for teaching and learning:

- Lecture Room
- Metal forming lab.
- Computer, Data show and Computer programs

Course coordinator:

Dr. Ibrahim Sabry

Head of the Department:

Prof. Dr. Nabil Gadallah

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN431: Modeling and Simulation

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology BSc. Program
Department offering the program: Manufacturing Engineering & Production Technology Dept.
Department offering the course: Manufacturing Engineering & Production Technology Dept.
Date of specifications approval: February 2019

B - Basic Information

Title: Modeling and Simulation
Teaching Hours: 3
Code: MNFN431
Lectures: 2
Year/level: Senior2 / 2nd Term
Tutorial: 1
Practical: 2
Pre-requisite: MNFN213

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:
Build mathematical models for real systems. Learn the proper simulation process steps. Gain knowledge about different queuing systems. Analyze manufacturing systems performance. Develop computer-based simulation programs to evaluate the system performance.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

- a1- Modeling of systems and subsystems (A1, A4, A5, A13)
- a2- The process of building a simulation model for real systems (A1, A5, A12, A13)
- a3- The computer-based techniques used to evaluate the system performance. (A5, A15, A17)
- a4- Evaluating the performance of queuing systems. (A5, A7, A16, A18)
- a5- Knowing the advantages and different applications for simulation process (A12, A16)

B - Intellectual skills

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

- b1- Build the equations describing the behavior of the system. (B1, B13)
- b2- Analyze modeled systems and the internal interactions. (B1, B2, B4, B5, B11, B13)
- b3- Develop computer programs to evaluate the system behavior. (B9, B14)

C - Professional and practical skills

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

- c1- Build mathematical models for real systems (C1, C7)
- c2- Differentiate between the different types of queuing systems (C6, C7, C17)
- c3- Build and run computer programs to evaluate the system behavior. (C5, C17)

D - General and transferable skills

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

- d1- Collect, and categorize ideas and information in a predictable and standard format. (D1, D4, D6)
- d2- Identify novel and/or original perspectives on the subject. (D4)
- d3- Summarize key points taken from a variety of standard sources. (D3)

Course Contribution in the Program ILO's

ILO's	Program ILO's
A	Knowledge and understanding A1, A4, A5, A7, A12, A13, A15, A16, A17, A18
B	Intellectual skills B1, B2, B4, B5, B9, B11, B13, B14
C	Professional and practical skills C1, C5, C6, C7, C17
D	General and transferable skills D1, D3, D4, D6

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction			
• Modeling, simulation, system definitions. • Basic elements of a simulation model. • Purpose of simulation. • Applications of simulation. • Advantages and limitations of simulation.	4	1	2
• Modeling			
• Types of models. • Basic principle rules of modeling. • Mechanical problems modeling. • Lagrangian (DOE and DAE). • Train system problem. • Atwood machine. • Manufacturing system modeling basics • Factory status flow modeling.	6	2	6
• Simulation process steps			
• Problem formulation. • Project planning. • System definition. • Data collection. • Model translation. • Verification. • Validation. • Experimental design. • Analysis. • Documentation.	6	2	4
• Queueing theory			
• Basic structure of queueing models. • Queue characteristics. • Terminology and notations. • Examples on different queueing systems models.	6	4	8
• Examples on simulation			
• Cost analysis. • Manual simulation.	4	4	6
• Revision	2	1	2
Total hours	28	14	28

4 - Teaching and Learning Methods

Course ILO's		Teaching Methods								Learning Methods				Assessment Method								
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory					Modeling	Self-learning	Experimental				Class	Quizzes	Reports	Mid-Term	Practical Exam
Knowledge & Understanding	a1	1	1										1					1		1	1	1
	a2	1	1										1					1		1		1
	a3	1	1										1					1		1		1
	a4	1	1										1					1				
	a5	1	1										1					1		1		1
Intellectual Skills	b1	1	1										1								1	1
	b2	1	1										1								1	1
	b3	1	1										1								1	1

Applied Prof.	c1	1	1											1						1	1
	c2	1	1											1						1	1
	c3	1	1											1						1	1
General Tran.	d1				1								1								
	d2				1								1								
	d3				1								1								1

5- Students' Assessment Methods:

Tools	Time schedule	Grading
Assignments	Weekly	20
Mid-term exam	Week 8	20
Practical Exam	Week 16	20
Final written exam	Week 16	40
	Total	100

6- List of References

6-1 Course notes

Lecture Notes and Handouts

6-2 Required Book:

- Chung, C.A. ed., 2003. *Simulation modeling handbook: a practical approach*. CRC press.
- Bender, E.A., 2012. *An introduction to mathematical modeling*. Courier Corporation.
- Bossel, H., 1994. *Modeling and simulation*. AK Peters/CRC Press.
- Altiock, T. and Melamed, B., 2010. *Simulation modeling and analysis with Arena*. Elsevier.

6-3 Periodicals, Web sites, etc.:

- MATLAB software package.
- AREAN software package.

7- Facilities Required for Teaching and Learning: Non

Course Coordinator: Prof. Dr. Nabil Gadallah

Head of the Department: Prof. Dr. Nabil Gadallah

Date: February 2019

Modern Academy for Engineering and Technology in Maadi



Course Specification

MNFN434: Automation in Production and Computer Integrated Manufacturing

A- Affiliation

Relevant program:	Manufacturing Engineering and Production Technology BSc Program
Department offering the program:	Manufacturing Engineering and Production Technology Department
Department offering the course:	Manufacturing Engineering and Production Technology Department
Date of specifications approval:	September 2018

B - Basic Information

Title: Automation in Production and Computer Integrated Manufacturing	Code: MNFN434	Level: Senior 2, First Semester
Credit Hours: 3	Lectures: 2	Tutorial/Exercise:1
	Pre-requisite: MNFN421	Practical: 2

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the construction and operation of hydraulic power systems and their basic elements. They should be able to operate, maintain, design, calculate and analyze the performance of hydraulic power systems and their basic components.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Basic requirements of automated flow lines (A5, A13)
- a2- Line balancing , assembly systems and line balancing (A12).
- a3- Numerical control and robot technology (A16, A21)
- a4- Flexible manufacturing system and group technology (A11, A23).
- a5- Sequential control ,sensors and PLC (A8)

b - Intellectual skills:

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

- b1- Analyze the performance of automated flow lines (B1, B2, B22)
- b2- Apply computer numerical control for automated lines (B13)
- b3- Evaluate the economic considerations when selecting automated lines (B14)
- b4- Use principles of line balancing for production lines (B16, B18).

c - Professional and practical skills:

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

- c1- Use cost analysis for evaluation of automated flow lines (C7)
- c2- Imply the techniques for line balancing (C5).
- c3- Use computer software and programming language for robots (C14, C22).
- c4- Use suitable applications of sequential control (PLC) for automated lines (C6).

d - General and transferable skills:

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

- d1- Work in a team and involve in group discussion and seminars (D1, D3).
- d2- Communicate effectively and present data and results orally and in written form (D3).
- d3- Use ICT facilities in presentations (D4).
- d4- Search for information's in references and in internet (D7).
- d5- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A5, A8, A11, A12, A16, A21, A23
B	Intellectual skills	B1, B2, B13, B14, B16, B18, B22
C	Professional and practical skills	C5, C7, C6, C14, C22
D	General and transferable skills	D1, D3, D4, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Production process and automated strategy	1		
➤ Economics of automated production lines	3	2	
➤ Analysis of automated production lines	4	2	
➤ Assembly systems and balancing of production lines	2	3	
➤ Flexible manufacturing systems	2		
CNC applications in automated manufacturing systems	2		6
Robots Technology	2		
• Robots Programming and applications in automated lines	2	2	2
➤ Automated material handling and storing system	2		4
• Group Technology, concepts, standard and applications	2	2	
• Sequential and programmable controllers	2	2	8
• PLC Technology and applications	1	2	8
• Control systems	1		
• Sensors applications in automation	2		2
➤ Production planning system	2		
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	7-th Week	20
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

A .M. Kohail, Selected Topics in Automation of production lines, 2012

6-3 Recommended books: M Groover, Automation of Production system, Prentice Hall, 1998

6-4 Periodicals, Web sites, etc.

Non

7- Facilities required for teaching and learning:

- Automation lab
- Computer, Data show and Computer programs; Automation studio,

Course coordinator:

Prof. A. M. Kohail

Head of the Department:

Dr. Abdelmagid Abdelatif

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN435: Advanced Facility Planning

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: Advanced Facility Planning
Credit Hours: 3
Code: MNFN435
Lectures: 2
Pre-requisite: MNFN312
level: 4 , Tenth Semester
Tutorial: 1
Practical: 2

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the different techniques for facilities planning including facilities location. They should be able to design facilities systems, layout and handling system for producing a product or a service with lowest cost, highest quality, and minimum resources.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- classification of tools and applications of facility planning (A3).
- a2- definition and analysis of product, process and schedule design interactions by studying the functions involved in the product development cycle (A2, A4).
- a3- Techniques for solving facility location problems by applying analytical facilities location methods (A4).
- a4- techniques for solving facility layout design problems through analyzing layout models and design algorithms (A4).
- a5- design and analysis of material handling systems through different material handling equipment and handling principles used in the warehousing, manufacturing and supporting operations (A13, A4).

b - Intellectual skills:

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

- b1- investigate the effect of different criteria (market proximity, availability of resources, .etc.) on the location decision (B5).
- b2- deduce the mathematical and graphical formulation of the location, allocation and layout problems (B1).
- b3- Analyze and investigate different facility planning strategies (B3).

c - Professional and practical skills:

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

- c1- calculate the location of a new facility using factors weights (C1).
- c2- solve discrete space location problems for locating single facility, qualitatively, quantitatively and using hybrid analysis (C2).
- c3- solve continuous space location problems (C3).
- c4- solve multiple facility problems , allocation problems, and location-allocation problems (C19).
- c5- develop facility planning strategy (C3).
- c6- use product/service design, process design to design the schedule and the facilities (C6).
- c7- use different techniques to measure and represent flow among departments (C5).
- c8- calculate space requirements for workstations, departments and aisle arrangement, (C5)

d - General and transferable skills:

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

- d1- Work in stressful environment in mini-projects (D2).
- d2- Communicate effectively orally and in written form (D3).

- d3- Demonstrate efficient IT capabilities in presenting work results (D4).
d4- Referrers to relevant literature (D9).

2- Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A3 ,A4, A13
B	Intellectual skills	B1, B3, B5
C	Professional and practical skills	C1, C2, C3, C5, D6, D19
D	General and transferable skills	D2, D3, D4, D9

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Introduction to the facilities planning	2	1	2
➤ Facilities location problems	4	2	4
➤ Facility design and capacity	2	1	2
➤ Facility layouts	4	2	4
➤ Layout planning models	2	1	2
➤ Qualitative factor analysis	2	1	2
➤ Product, process, and schedule design	4	2	4
➤ Political, economic& social aspects	2	1	2
➤ Knowledge based facility planning	2	1	2
➤ Facility planning for intelligent manufacturing systems.	4	2	4
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method									
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Laboratory experiments	Problem solving	projects				Modeling and simulation	Self-learning	cooperative	researches and reports			Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1		1								1	1						1	1			1
	a2	1	1		1		1	1				1		1	1			1		1			1
	a3	1			1		1					1	1					1		1			1
	a4	1			1		1					1	1					1		1			1
	a5	1	1	1		1	1	1				1	1	1	1			1	1	1			1
Intellectual Skills	b1	1		1				1					1	1						1			1
	b2				1		1						1	1				1		1			1
	b3	1						1					1						1				
Applied Professional Skills	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			
	c5	1			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	1	1			1

General Trans. Skills	d1	1					1					1					1		1		1
	d2				1	1						1	1					1		1	
	d3	1						1				1	1					1			
	d4				1	1	1	1				1	1					1	1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: projects, 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

6- List of references:

6-1 Course notes: None

6-2 Required books: James A. Tompkins, Facilities planning, 4th Ed., McGraw-Hill, 2010.

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.: None

7- Facilities required for teaching and learning:

- Computer Lab.
- Computer, Data show and optimization software

Course coordinator: Dr. Mohamed Saad Abdelkarim
 Head of the Department: Prof.. Nabil Gadalla
 Date: December 2018

Course Specification
MNFN437: Electro-Hydraulic and Pneumatic Systems

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: December 2018

B - Basic Information

Title: Electro-Hydraulic and Pneumatic Systems
Credit Hours: 3
Code: MNFN437 **Level:** 4th (Senior 2), Second Semester
Lectures: 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: MNFN313 & MNFN422

C - Professional Information

1 – Course Learning Objectives:

By the end of this course, the students should demonstrate the knowledge and understanding of the construction and operation of pneumatic systems hydraulic and electrohydraulic servo-systems and electrohydraulic proportional systems. They should be able to operate, design, calculate and analyze the steady state and dynamic performance of the proportional and servo-systems and their basic components.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Classification and fundamentals of fluid power systems (A3, A8).
- a2- Peculiarities of pneumatic systems; advantages, disadvantages, effect of air compressibility, air density and air viscosity. (A8)
- a3- construction and operation of basic pneumatic circuit and its basic elements; air compressors, valves, actuators, air filters, coolers and lubricators. (A1, A8,)
- a4- Theoretical background and basic equations relevant to pneumatic and hydraulic systems (A1, A13).
- a5- Hydraulic servo-actuators construction, operation and applications (A8).
- a6- Electrohydraulic proportional and servo-valves technology and applications (A8, A12).
- a7- Basics of electro-magnetics (A17)

b - Intellectual skills:

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

- b1- Analysis of the effects of air properties on the pneumatic system performance (B1, B13)
- b2- Deduce mathematical relations describing the performance of the hydraulic and electrohydraulic servo-systems (B13).
- b3- Analyze the steady state and dynamic performance of hydraulic and electrohydraulic servo-systems (B5, B14)
- b4- Use the principles of control engineering to solve the precision and stability problems in hydraulic and electrohydraulic servo-systems (B17)
- b5- Judge the effect of implementation of PID controller on performance of the electrohydraulic systems (B9).

c - Professional and practical skills:

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

- c1- Build, operate and analyze the function of basic industrial pneumatic systems (C3, C17)
- c2- Carry out convenient designs incorporating hydraulic and electrohydraulic systems (C3, C5).
- c3- Use computer software; Norgren pneumatic trainer, Matlab, TK solver and other available software calculate, simulate and animate pneumatic and hydraulic servo-systems and their components (C5, C6).
- c4- Design, describe mathematically, simulate and investigate the dynamic performance of a simple hydraulic system (C1, C2).
- c5- Improve the precision and stability of electro-hydraulic servo-system by implementing a PID controller (C2)
- c6- Use experimental facilities to assemble and operate Basic pneumatic systems (C17).
- c7- Present and discuss the results of design and calculation and prepare technical reports (C12, C13).

d - General and transferable skills:

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

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

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

d3- Use convenient software in presentations (D4).

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

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

Course Contribution in the Program ILO's

ILO's	Program ILO's
A Knowledge and understanding	A1, A3, A8, A12, A13, A17
B Intellectual skills	B1, B5, B9, B13, B14, B17
C Professional and practical skills	C1, C2, C3, C5, C6, C12, C13, C17
D General and transferable skills	D1, D3, D4, D7, D9

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Pneumatic systems:			
• Fundamentals and theoretical background	2	1	2
• Components of pneumatic power systems; compressors, valves; pressure control valves, directional control valves, flow control valves and actuators.	2		2
• Case studies: Basic industrial pneumatic systems.	2		4
➤ Fluid power systems fundamentals and basic equations	1	1	
➤ Modeling and dynamic performance of hydraulic transmission lines	1	1	2
➤ Hydraulic servo-actuators:			2
• Construction	1		
• Operation	1	1	
• Applications	1		
• Modeling, simulation and investigation of transient behavior	2	1	2
• Flow and Power characteristics- Case studies	1	1	
➤ Electro-hydraulic proportional-valves technology and applications	1		
➤ Electro-hydraulic servo-valve technology:			
• Construction, operation and classification:	1		
• Hydraulic amplifiers; flapper valve, Jet nozzle and jet deflector	1		
• Feedback: Mechanical, electric barometric	1	1	
• Transient and frequency response	1	1	
➤ Electro-hydraulic servo actuator:			
• Basics of electro-magnetics	1		
• Electromagnetic torque motor characteristics	1		1
• Flapper valve characteristics	1	1	
• Modeling and simulation of electro-hydraulic servo actuator (EHSA)	1	1	2
➤ Transient performance of EHSA and its subassemblies			
• Torque motor	1	1	1
• First stage	1	1	1
• Servo- valve	1	1	2
• Integrated EHSA	1	1	2
• PID controller for EHSA	1		1
➤ Mini project; investigate the transient performance of a small industrial hydraulic system.			4
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods		Assessment Method				
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1	1	1			1	1		1	1	1	1	
	a2	1			1					1		1		
	a3	1	1	1			1			1	1	1		1
	a4	1								1				
	a5	1		1	1			1	1	1	1	1	1	
	a6	1		1	1			1		1		1		
	a7	1			1					1			1	
Intellectual Skills	b1	1			1					1		1	1	
	b2	1			1			1	1	1		1		1
	b3	1			1					1		1	1	1
	b4	1		1	1					1				1
	b5	1			1				1	1	1	1	1	1
Applied Professional Skills	c1			1			1		1		1			
	c2	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
	c7							1						1
General Tran. Skills	d1			1		1		1					1	
	d2		1	1				1	1				1	
	d3	1	1					1					1	1
	d4	1	1	1				1						
	d5							1	1				1	

5- Assessment Timing and Grading:

Assessment Method		Timing	Grade (Degrees)
Mid-term written exam.		7 th Week	20
Semester work	quizzes	4 quizzes (Tri-weekly)	8
	assignments	Two per semester	4
	term papers	Two per semester	4
	Mini project	One per semester	4
Practical exam		Fifteenth week	20
Written exam		Sixteenth week	40
Total			100

6- List of references:

6-1 Course notes: Non

6-2 Required books

Rabie, M. G. (2009) Fluid Power Engineering, NY: McGraw-Hill Professional.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

<http://www.moog.com/>, (Last accessed November 5, 2018)

<http://www.boschrexroth.com/en/xcl/>, (Last accessed November 5, 2018)

<https://www.mgacontrols.com/products/pneumatics/>, (Last accessed November 5, 2018)

<http://www.eaton.com/Eaton/index.htm>, (Last accessed November 5, 2018)

<http://www.nfpa.com/>, (Last accessed November 5, 2018)

7- Facilities required for teaching and learning:

- Fluid Power Lab.
- Computer, Data show and Computer software; Matlab, Automation studio, Norgren pneumatic trainer and TK-Solver.

Course coordinator:	Professor M Galal Rabie
Head of the Department:	Professor Nabil Gadallah
Date:	December 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN438: Advanced Casting Techniques

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2018

B - Basic Information

Title: Advanced Casting Techniques **Code:** MNFN438 **Level:** Senior 2, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: MNFN223

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should demonstrate the knowledge and understanding of the advanced casting techniques and processes. Advanced casting methods of different materials and alloys.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

- a1- Near Net Shape. (A1, A3, A4, A8, A18, A19).
- a2- High rate pressure die casting. (A1, A3, A4, A8, A18, A19, A21)
- a3- Aluminum casting alloys for automotive. (A1, A3, A4, A8, A18, A19)
- a4- Aluminum casting alloys for aircrafts. (A1, A3, A4, A8, A18, A19)
- a5- Copper alloys for valves and machine parts (A1, A3, A4, A8, A18, A19).
- a6- Vacuum melting and vacuum pouring techniques (A1, A3, A4, A8, A18, A19, A21).
- a7- Slag metal refining of steels (A1, A3, A4, A8, A18, A19)
- a8- Single crystal castings (A1, A3, A4, A8, A18, A19)

b - Intellectual skills:

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

- b1- Choosing and differentiating between the methods of advanced casting techniques. (B1, B8, B12)
- b2- Designing the method needed for the advanced casting components (B3, B4, B14, B18).
- b3- Analyze the characteristics of advanced casting components (B5, B9, B14, B22)
- b4- Investigate the failure of components, systems and processes (B6)

c - Professional and practical skills:

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

- c1- Design, assemble, operate, and test the advanced casting components (C1, C3, C21)
- c2- Calculate the characteristics of advanced casting components (C1, C5).
- c3- Use computer software to design and calculate the advanced casting components (C5, C6, C17).
- c4- Use experimental facilities to investigate the defects and evaluate the characteristics of the advanced casting component (C12, C13, C16).

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4, A8, A18, A19, A21
B	Intellectual skills	B1, B3, B4, B5, B6, B8, B9, B12, B14, B18, B22
C	Professional and practical skills	C1, C3, C5, C6, C12, C13, C16, C17, C21
D	General and transferable skills	D1, D3, D7, D9

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➤ Near Net Shape	4	2	4
➤ High rate pressure die casting	3	2	3
➤ Aluminum casting alloys for automotive	3	2	4
➤ Aluminum casting alloys for aircrafts	3	2	4
➤ Copper alloys for valves and machine parts	3	1	3
➤ Vacuum melting and vacuum pouring techniques.	4	1	4
➤ Slag metal refining of steels	4	2	3
➤ Single crystal castings	4	2	3
Total hours	28	14	28

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods									Learning Methods				Assessment Method									
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments				
Knowledge & Understanding	a1	1	1	1	1	1	1					1	1			1	1	1		1				
	a2	1	1	1	1	1	1					1	1			1	1	1		1				
	a3	1	1	1	1	1	1					1	1			1	1	1		1				
	a4	1	1	1	1	1	1					1	1			1	1	1		1				
	a5	1	1	1	1	1	1					1	1			1	1	1		1				
	a6	1	1	1	1		1					1	1			1	1	1		1				
	a7	1	1	1	1		1					1	1			1	1	1		1				
	a8	1	1	1	1		1					1	1			1	1	1		1				
Intellectual Skills	b1	1	1	1	1		1					1	1			1		1		1				
	b2	1	1	1	1		1					1	1			1	1	1	1	1				
	b3	1	1	1	1		1					1	1			1	1	1	1	1				
	b4	1	1	1	1		1					1	1			1	1	1	1	1				
Applied Prof. Skills	c1	1	1	1	1		1					1	1			1	1	1		1				
	c2	1	1	1	1	1	1					1	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				
General Tran. Skills	d1			1		1	1					1						1						
	d2		1	1								1												
	d3			1								1												
	d4		1	1		1	1					1	1						1					

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester work: seminars, quizzes assignments and term papers	Bi-Weekly	20
Mid-term written exam.	7-th Week	20
Practical exam	Fifteenth week	20
Written exam	Sixteenth week	40
Total		100

6- List of references:

6-1 Course notes: Advanced Casting Techniques (Lecture Notes)

6-2 Required books

Pond, Roberts, " J. Introduction to Engineering Technology", Prentice Hall, 2002 (ISBN)780135 154304)

Dejarms, ETAL, "Materials and Processes in Manufacture" Mc Milan, 2004 (G780 470-55120).

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

- Lecture room
- Computer, Data show.

Course coordinator:

Ass. Prof. Ibrahim Mousa

Head of the Department:

Prof. Nabil Gadalla

Date:

September 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN461 : Project-2a

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Eng. and Production Tech. Department
Department offering the course: Manufacturing Eng. and Production Tech. Department
Date of specifications approval: November 2018

B - BASIC INFORMATION

Title : Project-2a
Credit Hours: 2
Code: MNFN461
Lectures: 1
Year/level: Level 4, First term
Tutorial:
Practical: 3
Pre-requisite: MNFN361

C - Professional Information

1 – Course Learning Objectives:

The graduation project is a conclusion work. Its aim is to show the ability of student to integrate the knowledge and skills acquired during program study to perform the assigned task. The project ideas may be initiated from the following:

- Projects that involve further investigation of a subject area discussed in a prior course.
- Project that involves a technical area in which the student has no prior course work or experience.
- Projects that involve a real local problem in the students home or place of employment.
- Projects proposed by department faculty members.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Time management to carry out the assigned task. (A14, A19)

b - Intellectual skills:

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

b1- Use of knowledge and basics of mathematics and sciences appropriate to the project (B1)

b2- Compare different techniques of solving problems and choosing the proper one to perform the task (B12).

b3- Apply of the appropriate technological means (B18).

b4- List of the assembly, disassembly, and calibration procedures (B3)

c - Professional and practical skills:

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

c1- Apply knowledge of different engineering disciplines in technological applications (C1, C2, C9)

c2- Test the function of the equipment (project) according to codes and standards and evaluate its performance (C5, C16, C18)

c3- Prepare the report of the project and a power point presentation (C12)

c4- Prepare all the technical documents and the user manual of the project (C13)

d - General and transferable skills:

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

d1- Present a report that includes all information about the project. (D3)

d2- determine technical specifications of different items of the project. (D6).

d3- Management of man power of the team work, assigning different tasks for each member to be fulfilled according to the time schedule, and different resources. (D6).

d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A14, A19
B	Professional and practical skills	B1, B3, B12, B18
C	Intellectual skills	C1, C2, C5, C9, C12, C13, C16, C18
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
<ul style="list-style-type: none"> The project requires the following steps to be carried out: <ul style="list-style-type: none"> ✓ The literature survey. ✓ Choice of the project construction based on some existing variants. ✓ Preparation of the constructional drawings of parts. ✓ Design of the most dangerous parts. ✓ Preparation of the process sheets to manufacture the parts. ✓ Assembly and testing of the project. ✓ Calibration of some parameters (if any). ✓ Preparation of the report ✓ Preparation of the presentation. 	14		42
Total hours	14		42

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method						
		Lecture	Presentations & Movies	Discussions & Tutorials	Problem solving	Site Visits	Projects		Modeling & Simulation	Self-learning	Cooperative	Researches & Reports		Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1			x	x							x							
Intellectual Skills	b1		x	x	x		x		x			x				x			
	b2		x	x	x		x		x			x				x			
	b2		x	x	x		x		x			x				x			
	b2		x	x	x		x		x			x				x			
Applied Professional Skills	c1		x		x		x	x	x			x		x					
	c2		x		x		x	x	x			x		x					
	c3		x		x		x	x	x			x		x					
	c4		x		x		x	x	x			x		x					
General Tran. Skills	d1		x	x			x					x		x		x			
	d2		x	x			x					x		x		x			
	d3		x	x			x					x		x		x			
	d4		x	x			x	x				x		x		x			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Year Work	14 th week	60
Final Oral Exam	Before Written Exams	40
Total		100

6- List of references:

6-1 Course notes: None

6-2 Required books: None

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning: None

Course coordinator:	Prof. Dr. Nabil Gadalla
Head of the Department:	Prof. Dr. Nabil Gadalla
Date:	November 2018

Modern Academy for Engineering and Technology in Maadi



Course Specification MNFN462 : Project-2b

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Eng. and Production Tech. Department
Department offering the course: Manufacturing Eng. and Production Tech. Department
Date of specifications approval: 25/02/2014

B - BASIC INFORMATION

Title : Project-2b
Credit Hours: 4
Code: MNFN462
Lectures: 3
Year/level: Level 4 , 10th semester
Tutorial: **Practical:** 3
Pre-requisite: MNFN461

C - Professional Information

1 – Course Learning Objectives:

The graduation project is a conclusion work. Its aim is to show the ability of student to integrate the knowledge and skills acquired during program study to perform the assigned task. The project ideas may be initiated from the following:

- Projects that involve further investigation of a subject area discussed in a prior course.
- Project that involves a technical area in which the student has no prior course work or experience.
- Projects that involve a real local problem in the students home or place of employment.
- Projects proposed by department faculty members.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Time management to carry out the assigned task. (A14, A19)

b - Intellectual skills:

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

- b1- Use of knowledge and basics of mathematics and sciences appropriate to the project (B1)
- b2- Compare different techniques of solving problems and choosing proper one to perform the task (B12).
- b3- Apply of the appropriate technological means (B18).
- b4- List of the assembly, disassembly, and calibration procedures (B3)

c - Professional and practical skills:

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

- c1- Apply knowledge of different engineering disciplines in technological applications (C1, C2, C9)
- c2- Test the function of the equipment (project) according to codes and standards and evaluate its performance (C5, C16, C18)
- c3- Prepare the report of the project and a power point presentation (C12)
- c4- Prepare all the technical documents and the user manual of the project (C13)

d - General and transferable skills:

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

- d1- Present a report that includes all information about the project. (D3)
- d2- determine technical specifications of different items of the project. (D6).
- d3- Management of man power of the team work, assigning different tasks for each member to be fulfilled according to the time schedule, and different resources. (D6).
- d4- Practice self-learning (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A14, A19
B	Professional and practical skills	B1, B3, B12, B18
C	Intellectual skills	C1, C2, C5, C9, C12, C13, C16, C18
D	General and transferable skills	D3, D6, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
<ul style="list-style-type: none"> The project requires the following steps to be carried out: <ul style="list-style-type: none"> ✓ The literature survey. ✓ Choice of the project construction based on some existing variants. ✓ Preparation of the constructional drawings of parts. ✓ Design of the most dangerous parts. ✓ Preparation of the process sheets to manufacture the parts. ✓ Assembly and testing of the project. ✓ Calibration of some parameters (if any). ✓ Preparation of the report ✓ Preparation of the presentation. 	28		84
Total hours	28		84

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method									
		Lecture	Presentations & Movies		Discussions & Seminars	Tutorials	Problem solving	Site Visits	Projects			Modeling & Simulation	Self-learning	Cooperative	Researches & Reports			Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1			x	x									x									
Intellectual Skills	b1		x	x	x			x				x			x					x			
	b2		x	x	x			x				x			x					x			
	b2		x	x	x			x				x			x					x			
	b2		x	x	x			x				x			x					x			
Applied Professional Skills	c1		x		x			x	x			x			x			x					
	c2		x		x			x	x			x			x			x					
	c3		x		x			x	x			x			x			x					
	c4		x		x			x	x			x			x			x					
General Tran. Skills	d1		x	x					x						x			x		x			
	d2		x	x					x						x			x		x			
	d3		x	x					x						x			x		x			
	d4		x	x				x	x						x			x		x			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Year Work	14 th week	60
Oral Exam	3 Weeks after final exams	40
Total		100

6- List of references:

- 6-1 Course notes:** None
- 6-2 Required books** None
- 6-3 Recommended books:** None
- 6-4 Periodicals, Web sites, etc.**

7- Facilities required for teaching and learning: None

Course coordinator:	Dr. Abdelmagid A. Abdalla
Head of the Department:	Prof. Dr. Nabil Gad Alla
Date:	November 2018

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Appendix 3

**شروط النجاح والتخرج وقواعد
حساب التقدير**

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شروط النجاح والتخرج وقواعد حساب التقدير

الآتي بعد مستخرج من الشق القانوني لللائحة الأكاديمية الحديثة للهندسة والتكنولوجيا بالمعادي للدراسة بالساعات المعتمدة (لائحة ٢٠١٨)

الباب الثاني: نظام الدراسة

مادة [٤]

يمنح وزير التعليم العالي بناءً على طلب مجلس إدارة الأكاديمية درجة بكالوريوس الهندسة والتكنولوجيا في أحد التخصصات التالية:

- ١- الهندسة الكهربائية:
- هندسة الإلكترونيات وتكنولوجيا الاتصالات.
- هندسة الحاسبات وتكنولوجيا المعلومات.
- ٢- الهندسة الميكانيكية:
- هندسة التصنيع وتكنولوجيا الإنتاج.
- ٣- الهندسة المعمارية:
- هندسة العمارة وتكنولوجيا البناء

مادة [٥]

مدة الدراسة لنيل درجة البكالوريوس خمس سنوات موزعة على ١٠ فصول دراسية رئيسية ويمكن للطلاب إنهاء متطلبات الحصول على درجة البكالوريوس المذكورة في المادة (٢٩) قبل ذلك بفصل دراسي واحد على الأكثر.

مادة [٦]: مشروع التخرج

يقوم طلبة المستوى الرابع بإعداد مشروع التخرج الذي يحدد موضوعه مجالس الأقسام المختصة، وتخصص له فترة إضافية بعد الامتحان التحريري يحددها مجلس الأكاديمية بناءً على اقتراح مجالس الأقسام المختصة، ويكون 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، ويراعى في اختيار الأقسام لموضوعات المشاريع أن تكون ذات طبيعة تطبيقية أو نظرية أو خليطاً بينهما نابعة من الاحتياجات العملية وطبيعة الدراسة بكل برنامج، ولا يتخرج الطالب إلا بعد أن يستوفي شروط النجاح في المشروع.

مادة [٧]: التدريب العملي والصناعي (التدريب الصيفي)

تشمل الدراسة نظاماً للتدريب العملي والصناعي لطلاب الأكاديمية في الإجازة الصيفية وتبدأ عقب انتهاء أداء الامتحانات التحريرية للفصل الدراسي الثاني (الربيع) بما لا يتعارض مع الدراسة في الفصل الصيفي.. ويتم تنفيذ التدريب وتقييم الطلاب كما يلي:

- (أ) مرحلة التدريب العملي لطلاب المستوى صفر والمستوى الأول وأدائه إلزامي للتسجيل ببعض المقررات التي تحددها الأقسام المختصة ويقرها مجلس التعليم بالأكاديمية، ويتم التدريب بعد سداد الطالب مقابل مادي يكافئ ساعتين معتمدتين.
- (ب) مرحلة التدريب الصناعي التخصصي لكل من طلبة المستوى الثاني والثالث ويتم في الجهات الصناعية ومراكز التدريب المعتمدة تحت إشراف الأكاديمية ويتم التدريب عقب انتهاء الفصل الدراسي الثاني (الربيع) ويقيم كل تدريب بثلاث ساعات معتمدة.

المرحلة الأولى:

التدريب العملي الصيفي لطلاب المستوى صفر والمستوى الأول:

- (أ) يتم التدريب داخل الأكاديمية في صالات الرسم ومعامل الأكاديمية والورش أو خارج الأكاديمية.
- (ب) يشتمل هذا التدريب على موضوعات عامة لازمة للبناء المعرفي للهندسة في مجالات تكنولوجيا الحاسبات والأجهزة الكهربائية والإلكترونية والرسم الهندسي والمعماري.
- (ج) يتم تقسيم المتدربين إلى مجموعات طبقاً لطبيعة التدريب ويتولى القسم العلمي المختص إدارة التدريب وتحديد المحتوى العلمي والمشرفين والمدرسين.
- (د) يتم التدريب لمدة اسبوعين بما يكافئ ٦٠ ساعة لكل مستوى.
- (هـ) يتم تقييم الطالب من القسم المختص على مجمل أدائه في فترة التدريب بالإضافة لاختبار شفهي أو عملي طبقاً لطبيعة التدريب. وتكون نتيجة التقييم ناجح/راسب (Pass/Fail) ولا تدخل في تقدير التخرج.

المرحلة الثانية:

التدريب الصناعي الصيفي التخصصي للمستوى الثاني والثالث:

- (أ) يتم هذا التدريب خارج الأكاديمية بمواقع الإنتاج والتنفيذ بالمؤسسات والمصانع والشركات ومراكز التدريب المعتمدة طبقاً للتخصصات المختلفة.
- (ب) يتم تحديد المحتوى العلمي لبرامج التدريب بالتنسيق بين الأقسام المختصة وجهات التدريب الخارجية وتوثق بتوقيع بروتوكولات تتضمن محتوى التدريب والمسؤوليات لكلا الطرفين.
- (ج) يقوم الطالب باختيار موضوع وجهة التدريب بالتنسيق مع مكتب التدريب بالأكاديمية.

- (د) يتم التدريب لفترة تكافئ ٦٠ ساعة لكل مستوى على أن يقوم القسم المختص بالإشراف والمتابعة ويرفع المسئول عن الإشراف تقارير دورية إلى القسم العلمي المختص ومكتب التدريب بالأكاديمية عن أداء جهات التدريب وانتظام الطلاب والتعامل مع معوقات التدريب.
- (هـ) بعد الانتهاء من التدريب يقوم كل قسم بتشكيل لجنة ثلاثية من أعضاء هيئة التدريس لمناقشة الطلاب وتقدير التقييم المناسب من إجمالي ١٠٠ درجة تشمل تقييم جهة التدريب وتقييم القسم المختص.
- (و) تضاف عدد ساعات التدريب للمنجزه ويضاف التقييم إلى التقدير التراكمي للطلاب عقب انتهاء تقييم التدريب.
- (ز) يتم عمل استقصاء للطلاب بعد انتهاء التدريب للوقوف على مشاكل التدريب في كل مستوى وتناقش نتيجة الاستقصاء في حضور الشركات وممثلي الأقسام العلمية ومجموعة من الطلاب.

مادة [٨]

يجب على الطلاب حضور ومتابعة الدروس والتمرينات العملية وأعمال الورش والتدريب طبقاً لأحكام اللائحة الداخلية للأكاديمية ويجوز لمجلس إدارة الأكاديمية أن يوقف قيد الطالب لمدة سنة دراسية ولا تزيد عن سنتين إذا تقدم بعذر مقبول يمنعه من الانتظام في الدراسة بعد موافقة رئيس الإدارة المركزية للتعليم الخاص بوزارة التعليم العالي. ويجوز لرئيس الإدارة المركزية مد هذه المدة بحد أقصى ضعف مدة الدراسة بالأكاديمية عند الضرورة القصوى.

الباب الثالث: قبول الطلاب

مادة [٩]

يحدد وزير التعليم العالي بعد اخذ رأى المجلس الأعلى لشئون المعاهد في نهاية كل عام جامعي عدد الطلاب من أبناء جمهورية مصر العربية أو غيرهم الذين يقبلون في الأكاديمية في ضوء احتياجاته في العام الجامعي التالي من الحاصلين على شهادة الثانوية العامة أو شهادة الثانوية الأزهرية أو الدبلومات الفنية نظام الخمس سنوات أو على الشهادات المعادلة ونظام قبولهم.

مادة [١٠]

يكون ترشيح الطلاب للأكاديمية عن طريق مكتب تنسيق القبول ما لم يصدر قراراً من وزير التعليم العالي بغير ذلك.

مادة [١١] شروط القبول وقيد الطلاب

- (أ) يسمح بالقيد بالأكاديمية للطلاب الحاصلين على شهادة الثانوية العامة شعبة رياضيات أو ما يعادلها، ممن يتم توزيعهم على الأكاديمية عن طريق مكتب التنسيق، أو من المحولين من كليات أو معاهد أخرى طبقاً للشروط التي يضعها المجلس الأعلى للجامعات. ولا يجوز تجاوز شروط مكتب التنسيق فيما يخص التوزيع أو التحويلات.
- (ب) أن يثبت الكشف الطبي خلوه من الأمراض المعدية وصلاحيته لمتابعة الدراسة وفقاً للقواعد التي يحددها المجلس الأعلى لشئون المعاهد العليا الخاصة.

مادة [١٢]

يعطى كل طالب بطاقة شخصية خاصة تلصق عليها صورته ويوقعها عميد الأكاديمية وتختم بخاتم الأكاديمية ويجب تقديم هذه البطاقة في كل شأن دراسي ولا يسمح لأي طالب بحضور الدروس والمحاضرات والتمرينات العلمية وبتأدية الامتحانات إلا إذا كان يحمل بطاقته.

مادة [١٣]

على كل طالب مقيد بالأكاديمية أن يثبت حضوره بالطريق الذي تحدده الأكاديمية.

مادة [١٤]

لا يجوز للطلاب أن يقيد اسمه في أكثر من معهد في وقت واحد ولا يجوز له أن يجمع بين القيد في معهد غير تابع للوزارة أو أي كلية جامعية ولا يجوز إعادة قيد الطالب بأي معهد للحصول على شهادة سبق له الحصول عليها كما لا يجوز إعادة قيده للحصول على شهادة أخرى من معهد مماثل.

مادة [١٥]

يتم قبول تحويل ونقل قيد الطلاب فيما بين المعاهد وفق القواعد الآتية:

- (أ) لا يجوز النظر في تحويل الطلاب المقيدين بالمستوى صفر بين المعاهد المتناظرة إلا إذا كان الطالب حاصلاً على الحد الأدنى للمجموع الذي وصل إليه القبول في المعهد المطلوب التحويل إليه، ويتم التحويل بموافقة عميدي المعهدين، أما إذا كان الطالب غير حاصل على الحد الأدنى للمجموع الذي وصل إليه القبول في المعهد المطلوب التحويل إليه فيجوز تحويله لأسباب مرضية معتمدة من القومسيون الطبي العام أو لأي ظروف أخرى يقرها مجلس إدارة الأكاديمية.
- (ب) يجوز النظر في تحويل الطلاب المقيدين بمستوى أعلى من المستوى صفر بين المعاهد المتناظرة إذا وجدت ظروف اجتماعية أو صحية تقتضي التحويل وذلك بموافقة عميدي المعهدين، ويجوز في هذه الحالة قيد الطالب في فرقة مُناظرة للفرقة التي كان مقيداً بها مع تأدية الامتحانات اللازمة في بعض المقررات أو الإعفاء في مقررات أخرى طبقاً لحالته وطبقاً لخطة الدراسة، وتحتسب المدة التي قضاها الطالب الراسب في الفرقة التي ينقل إلى نظيرها ضمن مدة الدراسة المتاحة له للحصول على درجة البكالوريوس.
- (ج) يجوز نقل قيد الطالب المنقول إلى مستوى أعلى من المستوى صفر بأي من الكليات الجامعية أو من معهد إلى معهد غير مناظر بشرط أن يكون حاصلاً على الحد الأدنى لمجموع الدرجات الذي وصل إليه القبول في المعهد المطلوب النقل إليه سنة حصوله على

الشهادة الثانوية أو السنة الجارية أيهما أفضل للطالب وذلك بموافقة عميدي المعهدين. وفي هذه الحالة يكون قيد الطالب في أول مستوى للدراسة بالأكاديمية.

(د) يشترط في جميع الحالات السابقة ألا يكون الطالب المطلوب تحويله أو نقل قيده قد استنفذ فرص الرسوب، وألا يكون الطالب قد فصل لسبب تأديبي، كما يشترط تقديم طلب التحويل بالأكاديمية قبل بدء الدراسة، ويجوز لمجلس إدارة الأكاديمية عند الضرورة القسوى قبول التحويل خلال الشهر التالي لبدء الدراسة، وفي جميع الحالات يشترط مراجعة وموافقة رئيس الإدارة المركزية المختص.

مادة [١٦]

يجوز أن يقبل بالأكاديمية الطلاب الذين استنفذوا مرات الرسوب في الكليات والمعاهد العالية الغير مناظرة وفقاً للقواعد الآتية:

(أ) أن يكون الطالب مقبداً في الكلية أو المعهد العالي في السنة الدراسية السابقة على السنة التي يلتحق فيها بالأكاديمية.

(ب) أن يكون قبولهم بموافقة مجلس الأكاديمية.

(ج) أن يكون حاصلاً في الشهادة الثانوية العامة شعبة رياضيات أو ما يعادلها على مجموع يؤهله للالتحاق بالأكاديمية في عام حصوله على تلك الشهادة أو في عام إلتحاقه بالأكاديمية أيهما أفضل للطالب.

ويكون التحاق هؤلاء الطلاب بالمستوى صفر مستجدين، وتقدم أوراقهم إلى الأكاديمية لإرسالها للإدارة المركزية المختصة بالوزارة للموافقة.

مادة [١٧]

يجوز قيد وإعادة قيد الطالب في الحالات الآتية:

(أ) الطالب المستجد الذي لم يستكمل إجراءات قيده لعذر مقبول.

(ب) الطالب الذي سحب أوراقه وهو مقيد بالأكاديمية وقدم عذراً.

(ج) الطالب الذي لم يتقدم لمكتب التنسيق في سنة حصوله على الثانوية العامة لعذر مقبول.

وفي جميع هذه الحالات تعتبر السنة التي تنقضي دون أن يقيد فيها الطالب نفسه عام رسوب اعتباري. ويكون القيد أو إعادة القيد بقرار من رئيس الإدارة المركزية المختص بعد موافقة مجلس إدارة الأكاديمية على إعادة القيد طبقاً لحالة الطالب.

الباب الرابع: الامتحانات

مادة [١٨]

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 أعيد قيده فيه.

مادة [١٩]

يصدر سنوياً قرار من وزير التعليم العالي - بناء على عرض رئيس قطاع التعليم - بتعيين رئيس عام الامتحان في الامتحانات النهائية في الأكاديمية.

ويعتبر عميد الأكاديمية رئيساً عاماً لامتحان النقل بها.

ويكون رئيس عام الامتحان مسؤولاً مسئولية كاملة عن تنظيم جميع الأعمال المتعلقة بالامتحان.

مادة [٢٠]

ترسل الأكاديمية إلى الإدارة المختصة بوزارة التعليم العالي قبل بدء موعد الامتحان بشهر على الأقل كشوفاً من ثلاث صور بأسماء الطلاب الذين سوف يتقدمون للامتحان سواء في امتحان النقل أو الامتحان النهائي، وتقوم الإدارة المختصة بمراجعة هذه الكشوف للتأكد من صحة قيد الطلاب بالأكاديمية واحقيتهم في تأدية الامتحان ويستبعد الطلاب الذين لا حق لهم في تأدية الامتحان ثم تعتمد هذه الكشوف وتحفظ صورة منها بالإدارة العامة لشئون الطلاب والامتحانات وترسل صورة للأكاديمية وتسلم الصورة الثالثة لرئيس عام الامتحان للعمل بمقتضاها في امتحان نهاية العام الدراسي.

مادة [٢١]

تعلن نتيجة امتحان النقل بعد مراجعتها من الإدارة المختصة بوزارة التعليم العالي واعتمادها من مجلس إدارة الأكاديمية كما تعلن نتيجة امتحان البكالوريوس بعد مراجعتها من الإدارة المختصة واعتمادها من وزير التعليم العالي ولا تعلن نتيجة الطلاب ولا يخلى طرفهم إلا بعد سداد جميع الرسوم والمصروفات المستحقة عليهم.

مادة [٢٢]

(أ) تقوم الأكاديمية بتحرير شهادات مؤقته لخريجي السنوات النهائية بوقعها عميد الأكاديمية موضحاً بها (الاسم - تاريخ الميلاد - جهة الميلاد - دور التخرج - تقدير مشروع التخرج - المعدل التراكمي - النسبة المئوية - التقدير العام) كما تقوم أيضاً بتحرير شهادات تقديرات النجاح في كل مادة.

(ب) كما تقوم الأكاديمية بتحرير الشهادات النهائية للخريجين محرراً بها تاريخ منح المؤهل من تاريخ اعتماد وزير التعليم العالي لنتيجة الامتحان وترسل إلى وزارة التعليم العالي لمراجعتها واعتمادها من الأستاذ الدكتور الوزير.

الباب الخامس: نظام الدراسة والتسجيل وتقديرات النجاح

مادة [٢٣]

يختص كل قسم من أقسام الأكاديمية بالتدريس وإجراء البحوث التي تخص مقرراته طبقاً لبرامج الساعات المعتمدة وجدول النظام الكودي للمقررات الدراسية وتفصيلها. وللأقسام العلمية الحق في اقتراح شروط وضوابط الالتحاق بها طبقاً لطبيعة كل قسم والإمكانات المادية والبشرية المتاحة بالقسم وذلك بعد موافقة مجلس الأكاديمية.

مادة [٢٤] المقررات العامة:

يعهد مجلس الأكاديمية إلى قسم أو أكثر بتدريس المقررات العامة ذات الكود (عام) تحت الإشراف المباشر لوكيل الأكاديمية.

مادة [٢٥]

تتم الدراسة باللغة الانجليزية، وتضع الأكاديمية نظاماً للتأكد من مستوى الطالب في اللغة الانجليزية، ويستثنى من ذلك بعض المقررات الإنسانية (متطلبات المقررات الثقافية العامة) وبعض مقررات الهندسة المعمارية والمدنية، ويكون الامتحان بنفس اللغة التي يدرس بها المقرر. وتحتسب الساعات كما يلي:

- ساعات المحاضرات: ١ ساعة محاضرة تساوي ١ ساعة معتمدة.
- ساعات التمارين: تمرين مدته ١ ساعة يساوي صفر.
- تمرين مدته من ٢ إلى ٣ ساعات يساوي ١ ساعة معتمدة.
- ساعات المعمل والتطبيقات العملية: ساعتين معمل وتطبيقات تساوي ١ ساعة معتمدة.

مادة [٢٦]: مواعيد الدراسة والقيد

يقسم العام الدراسي بالأكاديمية إلى ثلاثة فصول دراسية على النحو التالي:

- الفصل الدراسي الرئيسي الأول (الخريف): يبدأ في بداية العام الدراسي في شهر سبتمبر ولمدة لا تقل عن ١٤ أسبوع.
- الفصل الدراسي الرئيسي الثاني (الربيع): يبدأ عقب إجازة منتصف العام في شهر فبراير ولمدة لا تقل عن ١٤ أسبوع.
- الفصل الصيفي: يبدأ أواخر شهر بعد انتهاء الفصل الدراسي الثاني ولمدة لا تقل عن ٧ أسابيع.

مادة [٢٧]

شروط التسجيل للدراسة بنظام الساعات المعتمدة:

- حتى ١٨ ساعة معتمدة في الفصل الدراسي الرئيسي للطالب الحاصل على معدل تراكمي ≥ 2.0 .
- حتى ١٤ ساعة معتمدة في الفصل الدراسي الرئيسي للطالب الحاصل على معدل تراكمي > 2.0 .
- حتى ٢١ ساعة معتمدة في الفصل الدراسي الرئيسي للطالب الحاصل على معدل تراكمي ≤ 3.0 .
- حتى ٦ ساعات معتمدة لأي طالب في الفصل الصيفي ويمكن التسجيل حتى ٩ ساعات بموافقة المرشد الأكاديمي إذا استدعت متطلبات التخرج ذلك.

ويتم إعداد خريطة للمقررات مع تقسيم المقررات على المستويات الدراسية التصاعديّة المحددة بالمادة [٢٨]. 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، وبعد أدنى ما يقابل رسوم خدمة تعليمية لعدد ١٢ 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 [٢٨]: مستويات الدراسة

يوضح الجدول التالي موقع الطالب ومستويات الدراسة معتمداً على عدد الساعات المعتمدة التي ينتهي الطالب من دراستها.

المستوى الدراسي	تعريف موقع الطالب بنظام الدراسة	نسبة عدد الساعات المعتمدة التي اجتازها الطالب
صفر	Freshman	من ٠% حتى ٢٠%
الأول	Sophomore	أكثر من ٢٠% حتى ٤٠%
الثاني	Junior	أكثر من ٤٠% حتى ٦٠%
الثالث	Senior 1	أكثر من ٦٠% حتى ٨٠%
الرابع	Senior 2	أكثر من ٨٠% حتى ١٠٠%

مادة [٢٩]

متطلبات الحصول على درجة البكالوريوس:

- الاجتياز بنجاح لمقررات مكافئة لعدد (١٨٠) ساعة معتمدة وبمعدل تراكمي لا يقل عن (٢).
- النجاح في مشروع التخرج.
- اجتياز المقررات التي يكون التقييم فيها ناجح / راسب (Pass/Fail) ولا تحتسب ضمن المعدل التراكمي مثل مقررات التدريب الصيفي للمستوي صفر والمستوي الأول.

مادة [٣٠] المرشد الأكاديمي للدارسين

يتم تعيين مرشد أكاديمي لكل (٥٠) طالب على الأكثر من بين أعضاء هيئة التدريس بالأقسام التخصصية ويقوم بمعاونة الطلاب في وضع الخطة الدراسية لهم.

مادة [٣١]

شروط التعديل والإلغاء والانسحاب وإيقاف القيد:

- (أ) يحق للطلاب 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 للطلاب 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 سداؤه 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 رسوم.

مادة [٣٢]

تقديرات المقررات الدراسية:

- (أ) تقدر نقاط كل مقرر على النحو الموضح بالجدول رقم (٢):

جدول رقم (٢)

التقدير	عدد النقاط	النسبة المئوية المناظرة
A+	4.0	٩٧% وأعلى
A	4.0	٩٣% حتى أقل من ٩٧%
A-	3.7	٨٩% حتى أقل من ٩٣%
B+	3.3	٨٤% حتى أقل من ٨٩%
B	3.0	٨٠% حتى أقل من ٨٤%
B-	2.7	٧٦% حتى أقل من ٨٠%
C+	2.3	٧٣% حتى أقل من ٧٦%
C	2.0	٧٠% حتى أقل من ٧٣%
C-	1.7	٦٧% حتى أقل من ٧٠%
D+	1.3	٦٤% حتى أقل من ٦٧%
D	1.0	٦٠% حتى أقل من ٦٤%
F	صفر	أقل من ٦٠%

- (ب) المقررات التي يسجل فيها الطالب كمستمع، أو التي يُطلب فيها النجاح فقط، أو لم يكملها بسبب قِبلته الأكاديمية، ولا تدخل في حساب متوسط النقاط، يرصد له أحد التقديرات التالية:

التقدير	المدرول
AU	Audit مستمع
P	Pass ناجح
F	Fail راسب
W	Withdrawn منسحب

مادة [٣٣]

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 [٣٢].
- (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 [٣٤]

مراتب الشرف ومنح التفوق:

- أ) تمنح مرتبة الشرف للطالب الذي لا يقل المعدل التراكمي عن ٣,٣ 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 مقاصه ويشترط لمنح مرتبة الشرف ألا يكون الطالب قد حصل على تقدير (F) في أي مقرر خلال دراسته الجامعية.
- ب) عند التحاق أي من الطلاب الثلاثين الأوائل في الثانوية العامة المصرية – تخصص رياضيات ببرامج الساعات المعتمدة يعفي من كافة الرسوم والمصروفات الدراسية خلال الفصل الدراسي الأول لدرسته في الأكاديمية ويظل هذا الإعفاء سارياً طالما حصل الطالب على معدل تراكمي يساوي ٣,٦ أو أكثر.
- ت) تضع الأكاديمية نظاماً لتشجيع المتفوقين عن طريق تخفيض المصروفات بنسب متدرجه مع المعدل التراكمي وتعلن في بداية كل فصل دراسي قائمة الطلاب المتفوقين ونسب تخفيض المصروفات لكل طالب.

مادة [٣٥]

الإنذار الأكاديمي - الفصل من الدراسة - آليات رفع المعدل التراكمي:

- أ) إذا انخفض المعدل التراكمي للطالب إلى أقل من (٢) في أي فصل دراسي يوجه له إنذار أكاديمي يقضي بضرورة رفع الطالب لمعدله التراكمي إلى (٢) على الأقل.
- ب) يُفصل الطالب المنذر أكاديمياً من الدراسة ببرامج الساعات المعتمدة إذا تكرر انخفاض معدله التراكمي عن (٢) 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 (٢) على الأقل فرصة واحدة وأخيره مدتها فصلين دراسيين رئيسيين لرفع معدله التراكمي إلى (٢) وتحقيق متطلبات التخرج إذا كان قد أتم بنجاح دراسة ٨٠% من الساعات المعتمدة المطلوبة للتخرج على الأقل.
- ج) يجوز للطالب إعادة دراسة المقررات التي سبق نجاحه فيها بغرض تحسين المعدل التراكمي وتكون إعادة دراسة وامتحاناً ويُحتسب له التقدير الأعلى وذلك بعد أقصى ٥ مقررات إلا إذا كان التحسين لغرض رفع الإنذار الأكاديمي أو تحقيق متطلبات التخرج وفي جميع الأحوال يُذكر كلا التقديرين في سجله الأكاديمي.

مادة [٣٦]: تعريف حالة الطالب الدارس بنظام الساعات المعتمدة:

كلما أكمل الطالب ٢٠% من متطلبات التخرج اعتبر منتقلاً من مستوى إلى مستوى أعلى منه (المستويات من صفر إلى أربعة)، ولا يتطلب ذلك تحديد نوعية أو مستوى المقررات التي أكملها الطالب، ويعتبر ذلك نوعاً من التعريف بموقع الطالب بالأكاديمية.

مادة [٣٧]

أسلوب تقييم الطالب:

- أ) يعقد لكل مقرر امتحان تحريري في منتصف الفصل الدراسي لا تقل درجته عن ١٠% من مجموع درجات المقرر.
- ب) يجوز خفض درجات الامتحان التحريري بحيث لا تقل درجته عن ٤٠% من درجات المقرر، مع وضع القواعد والشروط المنظمة والتي تؤكد على وجوب حصول الطلاب على نسبة لا تقل عن ٤٠% 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 ٦٠% 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 للمستوي صفر والمستوي الأول 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 [٣٨]

نسبة الحضور والحرمان من الامتحان والأعذار:

- أ) الحد الأدنى لنسبة الحضور للمقرر لا تقل عن ٧٥% ليسمح للطالب بدخول الامتحان النهائي للمقرر. وفي حالة حرمانه من الامتحان يعتبر راسباً (يعطى درجة صفر في درجة الامتحان النهائي للمقرر).
- ب) إذا تقدم الطالب بعذر يقبله مجلس الأكاديمية عن عدم حضور الامتحان النهائي لأي مقرر قبل أو بعد يومين من إجراء الامتحان، يحتسب له تقدير "غير مكتمل" في هذا المقرر، بشرط أن يكون ناجحاً في أعمال السنة، وألا يكون قد تم حرمانه من دخول

الامتحانات النهائية. وفي هذه الحالة يتاح للطالب الحاصل على تقدير "غير مكتمل" فرصة أداء الامتحان النهائي لهذا المقرر في الموعد الذي يحدده مجلس الأكاديمية.

ت) 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.

مادة [٣٩]

- التحويل بين نظام الدراسة بالساعات المعتمدة وبالفصلين الدراسي:
- أ) يجوز تحويل الطالب المقيد بنظام الساعات المعتمدة إلى نظام الفصلين الدراسي طالما لم يجتاز ٦٠% من إجمالي الساعات المعتمدة اللازمة للتخرج ويتم إجراء مقاصة للمقررات التي اجتازها الطالب في نظام الساعات المعتمدة وتحدد المقررات المكافئة لها في البرنامج الدراسي المطلوب التحويل إليه.
- ب) لا يجوز تحويل طلاب نظام الفصلين الدراسي المفصولين لاستنفاد مرات الرسوب في السنة الإعدادي أو السنوات اللاحقة إلى نظام الدراسة بالساعات المعتمدة.
- ت) لا يجوز تحويل الطالب من نظام الساعات المعتمدة إلى نظام الفصلين الدراسي إذا لم يحقق شروط القبول لنظام الفصلين الدراسي عند التحاقه بالأكاديمية.
- ث) يستخدم الجدول التالي لحساب التقديرات المكافئة عند تحويل الطالب بين النظامين أو عند حساب التقدير المكافئ للخريجين المختارين للتعيين كمعدين.

جدول تكافؤ التقديرات عند التحويل من نظام الفصلين الدراسي إلى نظام الساعات المعتمدة

نظام الساعات المعتمدة	نظام الفصلين الدراسي
التقدير	النسبة المئوية التي حصل عليها
A+	95 % إلى 100%
A	90% إلى >95%
A-	85% إلى >90%
B+	80% إلى >85%
B	75% إلى >80%
B-	71% إلى >75%
C+	68% إلى >71%
C	65% إلى >68%
C-	60% إلى >65%
D+	55% إلى >60%
D	50% إلى >55%
F-	>50%

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