Modern Academy for Engineering and Technology in Maadi
Mechanical Engineering Department

Manufacturing Engineering and Production Technology
B.Sc. Program Specification
(By Law 2012)

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مقدمة

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

ويختص المهندسون بحل المشاكل الواقعيّة، 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 أمانًا وملائمة للاستعمال اليومى. كما يسعون إلى التطوير من خلال الاختراع والتصميم والتصنيع والبناء. كما تهدف مجمل الأنشطة الهندسية إلى الحصول على نتائج إيجابية لتحسين المعيشة بيد ان هناك عوائق تصاحب هذه الأنشطة مثل تلوث المياه والهواء والبيئة والتلوث الصوتي الناتج عن الإنجازات الهندسية المبهرة خلال العقود الماضية. كذلك يصطدم عمل المهندس أثناء مواجهة المشكلات بقيود متنامية نتيجة تشابك وتقارب المشكلات الاجتماعية والتقنية. وعلى سبيل المثال فإن مشكلة تلوّث الهواء لا يمكن أن تُحَلّ بدون اعتبار التناقضات الأخلاقيّة والسّياسيّة والقانونيّة والاجتماعيّة. علاوة على ذلك، يجب أن يأخذ فى الاعتبار تأثير الحلول الهندسية المتاحة على مصالح الأفراد والمجموعات.

وتقدم دراسة الهندسة للطلاب تعليما فعالا ومبنيا على أسس تكنولوجية، آخذا فى الاعتبار التوقعات المستقبلية للعلم والتكنولوجيا. وهى أيضا توفر المعارف التقنية والمهارات الضرورية لحل المشاكل التي تسمح بمواجهة التحديات المستقبلية. وتحدد المعايير الأكاديمية المرجعية القومية (NARS) للهندسة مفاهيما شاملة تمثل التوقعات والطموحات العامة بخصوص معايير درجة البكالوريوس في العلوم الهندسية، كما توضح هذه المفاهيم المواصفات والخصائص التى يتمتع بها خريج البرامج الدراسية الهندسية خاصة:

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

وقد تم تصميم برنامج هندسة التصنيع وتكنولوجيا الإنتاج لإعداد المهندسين المتميزين فى مجالات التصميم الميكانيكى وتكنولوجيا الإنتاج إضافة إلى هندسة التصنيع التى تدرس من خلال مجموعة من المواد التمييزية والتى تعطى لخريج البرنامج تأهيلا متميزا مقارنة بخريجى البرامج المثيلة لسد احتياجات سوق العمل.

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

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

والله ولى التوفيق،،،

د. عبد المجيد عبد اللطيف
رئيس قسم الهندسة الميكانيكية

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Content

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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:	Manufacturing Engineering and Production Technology Department
Coordinator:	Dr Abdelmagid Abdelatif
Assistant Co-ordinator:	
External Evaluators:	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 program adopts the National Academic Reference Standards (NARS) issued by the National Authority for Quality Assurance and Accreditation in Education, August 2009 edition. It fulfills the NARS requirements of mechanical design and production in addition to distinguished manufacturing engineering discretionary courses.
Program Started on:	2012-2013

Dates of program specifications approval: 16/02/2014

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 NARS requirements of mechanical design and production in addition to distinguished manufacturing engineering as discretionary courses.

A B.Sc. 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 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.

2.2. 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.

19 - Apply the principles of production processes with classic and up-to-date technologies in manufacturing and testing.
20 - Use advanced technologies and instrumentation in measurements and data analysis.
21 -Underlining the key roles of safety dimensions, sustainable technology, environmental friendliness, and cleaner production measures in manufacturing, materials, managerial and economic alternatives.
22 -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 engineering program should be able to:

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

2.4. Curriculum Structure and Content

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

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

2.4.1. Humanities and social science courses

a) Acquiring knowledge of non-engineering fields that strengthen the consciousness of the engineer of the society and its culture, including business, marketing, wellness, ethics, law, arts, etc.
b) The ability to consider and evaluate the impact of the technology on the society, public health and safety.
c) The ability to appreciate and engage in social and entrepreneurial activities essential to the engineering practice and reflect on the management of the economics and social science
d) The ability to engage in life-long learning and respond effectively to the needs of the society.

Table 1 Humanitarian Courses

Code	Course	Hours				Prerequisite	Subject Area According to NARS						
		Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
GEN 141	Contemporary Social Issues	2	2	-	-	None	2						
GEN 143	History of Engineering and Technology	2	2	-	-	None	2						
GEN 142	English Language	2	2	-	-	None	2						
GEN 242	Technical Report Writing	3	2	2	-	None	3						
GEN 241	presentation skills	2	2	-	-	None	2						
GEN 354 GEN 353 GEN 351	Elective-2: a) Sound systems and Noise Pollution b) Management and International Business and total quality management c) Engineering Economy	2	2	-	-	None	2						
MNF 551	Elective-3: a) Environmental Studies	2	2	-	-	None	2						

MNF 552 GEN 453	b) Industrial Project Management c) Industrial Psychology												
 MNF 553 GEN 454 GEN 352	Elective-5: a) Industrial Social Impact b) Basics of Engineering Syndicate Works c) Engineering Laws and Regulations	2	2	-	-	None	2						
Total	**8courses**	**17**	**16**	**2**	**-**	**9.5%**	**17**						

2.4.2. Mathematics and Basic Sciences

Mathematics

Mathematical Courses give the following knowledge and understanding and skills:

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

Basic Sciences

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

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

Table 2: Mathematics and Basic Science Courses

Code	Course	Hours				Prerequisite	Subject Area According to NARS						
		Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MTH 101	Math-1 (Algebra and Calculus)	3	2	2	-	None		3					
PHY 101	Physics-1	3	2	1	2	None		3					
CHE 100	Chemistry	3	2	1	2	None		3					
MEC 101	Mechanics-1	2	1	3	-	None		2					
MTH 102	Math-2 (Integration and Analytic Geometry)	3	2	3	-	MTH 101		3					
PHY 102	Physics-2	3	2	1	2	PHY 101		3					
MEC 102	Mechanics-2	2	1	3	-	MEC 101		2					
CMP 110	Program Design and Computer Language	4	2	3	2	None		4					
MTH 203	Math-3 (Differential Equations and Transforms)	3	2	3	-	MTH 102		3					
MTH 207	Math-7 (Numerical Analysis)	3	2	2	-	MTH 203		3					
MTH 305	Math-5 (Introduction to Probability and Statistics)	3	2	2	-	MTH 102		3					
Total	**11 courses**	**32**	**20**	**24**	**8**	**17.88 %**		**32**					

2.4.3. Basic Engineering Courses

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

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

Table 3: Basic Engineering Courses

Code	Course	Hours				Prerequisite	Subject Area						
		Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MNF 101	Eng. Graphics	3	1	6	-	None			3				
MNF 102	Principles of Production Engineering	3	1	-	4	MNF 101			3				
MNF 100	Introduction to Engineering Materials	1	1	-	-	None			1				
MNF 211	Mechanics of materials	3	2	3	-	MEC 101			3				
MNF 212	Fundamentals of materials Science	3	2	1	2	MNF 100			3				
MNF 213	Mechanics of Machines-1	3	2	3	-	MEC 102			3				
MNF 214	Machine Drawing-1	3	2	3	-	MNF 101			3				
MNF 215	Mechanics of Machines-2	3	2	3	-	MNF 213			3				
MNF 216	Machine Drawing-2	3	1	6	-	MNF 214			2		1		
MNF 311	Fluid Mechanics	3	2	1	2	MTH 102			2		1		
MNF 312	Computer Applications-1	3	-	6	-	CMP 110					3		
MNF 313	Computer Applications-2	2	-	6	-	MNF 312					2		
MNF 314	Thermodynamics	3	2	1	2	PHY 102			3				
ELC 316	Electro Engineering	3	2	1	2	PHY 102			3				
ELC 317	Electric Machines	3	2	1	2	ELC 316			3				
MNF 411	Mechanical Measurements	3	2	-	2	MNF 211			2			1	
MNF 412	Industrial Operations Research	3	2	2	-	None			2		1		
MNF 413	Automatic Control	3	2	1	2	MTH 203			2		1		
MNF 511	Quality Control and Quality Management	3	2	1	2	MTH 305							3
MNF 433 MNF 431 MNF 432	Elective-1: a) Production and Operations Management. b) Heat Transfer c) Mechanical Vibrations	3	2	1	2	 MNF 314 MNF 215			3				
Total	**20 Courses**	**57**	**32**	**46**	**22**	**31.28 %**			**44**		**9**	**1**	**3**

2.4.4. Applied Engineering and design Courses and Projects

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

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

Table 4: Applied Engineering Courses and Projects

Code	Course	Hours				Prerequisite	Subject Area						
		Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MNF 221	Metal Cutting Processes	3	2	1	2	MNF 102				3			
MNF 222	Materials Technology and Testing	3	2	1	2	MNF 211, MNF 212				3			
MNF 321	Metals Cutting Theory	3	2	1	2	MNF 221				3			
MNF 322	Machine Design-1	3	2	3	-	MNF 216				3			
MNF 323	Foundry Technology	3	2	1	2	MNF 212							3
MNF 324	Machine Design-2	3	2	3	-	MNF 322				3			
MNF 325	Engineering Metrology	3	2	1	2	MNF 221				3			
MNF 421	Joining Processes	3	2	1	2	MNF 212							3
MNF 422	Computer Numerical Control, CNC MACHINES	3	2	1	2	MNF 313, MNF 221				1	2		
MNF 423	Computer Aided Design (CAD)	3	2	1	2	MNF 324				1	2		
MNF 424	Advanced Materials and Composite	3	2	1	2	MNF 222				3			
MNF 425	Modern Manufacturing Methods	3	2	1	2	MNF 321							3
MNF 521	Computer Aided Manufacturing (CAM)	3	2	-	2	MNF 422				1	2		
MNF 522	Hydraulic Power Systems	3	2	1	2	MNF 311				2	1		
MNF 523	Production Aids Design	3	2	1	2	MNF 321				2	1		
MNF 524	Industrial Thermal Systems	3	2	1	2	MNF 314				2	1		
MNF 531 MNF 538 MNF 532	Elective-4: a) Modeling and Simulation b) Advanced casting techniques. c) Failure Analysis and Fracture	3	2	1	2	MNF 313 MNF 323 MNF 211				2	1		
MNF 536 MNF 533 MNF 534	Elective-6: a) Industrial Robotics b) Rapid Prototyping c) Automation in Production and CIM	3	2	1	2	MNF 215 MNF 312 MNF 521				3			
MNF 530 MNF 535 MNF 537	Elective-7: a) Advanced Forming Techniques b) Advanced Facility Planning c) Electro- Hyd. and Pneumatic Systems	3	2	1	2	MNF 222 MNF 412 MNF 522				**3**	**0**		**0**
Total	**15 courses**	**57**	**30**	**19**	**26**	**31.66 %**				**38**	**10**		**9**

2.4.5. Projects & Training

The projects give the following knowledge and understanding and skills:

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

Table 5: Projects and Training Courses

Code	Course	Hours				Prerequisite	Subject Area						
		Cred	Lec	Tut	Lab		Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
MNF 361	Seminar-1.	1	-	2	-	-						1	
MNF 362	Seminar-2.	1	-	2	-	-						1	
MNF 461	Project-1	3	1	-	6	-						3	
MNF 462	Industrial Training(1)	3	1	-	4	-						3	
MNF 561	Project-2a	2	1	-	3	-						2	
MNF 562	Industrial Training(2)	3	1	-	4	-						3	
MNF 563	Project-2b	4	2	-	6	-						4	
Total	**7 courses**	**17**	**6**	**4**	**22**	**9.44 %**						**17**	

Table 6: Credit hours distribution

	Subject Area							Total Credit Hours	Percentage	Requirements of the Engineering Sector Committee
	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary			
Humanitarian Courses	17							**17**	**9.44**	**8-10%**
Mathematics and Basic Science Courses		32						**32**	**17.78**	**15-20%**
Basic Engineering Courses			46		7	1	3	**57**	**31.67**	**30-35%**
Applied Engineering Courses Including Projects & Training				38	10	17	9	**74**	**41.11**	**35-40%**
Total Credit Hours	**17**	**32**	**46**	**38**	**17**	**18**	**12**			
Percentage	**9.44**	**17.78**	**25.56**	**21.11**	**9.44**	**10**	**6.67**			
NARS Engineering Requirements	**9-12%**	**20-26%**	**20-23%**	**20-22%**	**9-11%**	**8-10%**	**6-8%**			

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

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

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

2.4.6. Sample study plan

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

Table 7 Freshman, First Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MTH 101	Math-1 (Algebra and Calculus)	3	2	2	-
PHY 101	Physics-1	3	2	1	2
MNF 101	Eng. Graphics	3	1	6	-
CHE 100	Chemistry	3	2	1	2
MEC 101	Mechanics-1	2	1	3	-
GEN 141	Contemporary Social Issues	2	2	-	-
GEN 143	History of Engineering and Technology	2	2	-	-
Total		18	12	13	4

Table 8 Freshman, Second Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MTH 102	Math-2 (Integration and Analytic Geometry)	3	2	3	-
PHY102	Physics-2	3	2	1	2
MEC 102	Mechanics-2	2	1	3	-
MNF102	Principles of Production Engineering	3	1	-	4
CMP110	Program Design and Computer Language	4	2	3	2
GEN 142	English Language	2	2	-	-
MNF100	Introduction to Engineering Materials	1	1	-	-
	Total	18	11	10	8

Table 9 Sophomore, Third Semester

Code	**Course**	**Hours**			
		Cred	**Lec**	**Tut**	**Lab**
MTH 203	Math-3 (Differential Equations and Transforms)	3	2	3	-
MNF 211	Mechanics of materials	3	2	3	-
MNF 212	Fundamentals of materials Science	3	2	1	2
MNF 213	Mechanics of Machines-1	3	2	3	-
GEN 241	Presentation Skills	2	2	-	-
MNF 214	Machine Drawing-1	3	2	3	-
	Total	17	12	13	2

Table 10 Sophomore, Fourth Semester

Code	**Course**	**Hours**			
		Cred	**Lec**	**Tut**	**Lab**
MTH 207	Math-7 (Numerical Analysis)	3	2	2	-
MNF 215	Mechanics of Machines-2	3	2	3	-
MNF 222	Materials Technology and Testing	3	2	1	2
MNF 221	Metal Cutting Processes	3	2	1	2
GEN 242	Technical Report Writing	3	2	2	-
MNF 216	Machine Drawing-2	3	1	6	-
	Total	18	11	15	4

Table 11 Junior, Fifth Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MTH 305	Math-5 (Introduction to Probability and Statistics)	3	2	2	-
MNF 311	Fluid Mechanics	3	2	1	2
MNF 321	Metal Cutting Theory	3	2	1	2
MNF 312	Computer Applications-1	3	-	6	-
MNF 322	Machine Design-1	3	2	3	-
ELC 316	Electro Engineering	3	2	1	2
MNF 361	Seminar-1.	1	-	2	-
	Total	19	10	16	6

Table 12 Junior, Sixth Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MNF 323	Foundry Technology	3	2	1	2
MNF 313	Computer Applications-2	2	-	6	-
MNF 324	Machine Design-2	3	2	3	-
MNF 325	Engineering Metrology	3	2	1	2
MNF 314	Thermodynamics	3	2	1	2
ELC 317	Electric Machines	3	2	1	2
MNF 362	Seminar-2.	1	-	2	-
	Total	18	10	15	8

Table 13 Senior 1, Seventh Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MNF 411	Mechanical Measurements	3	2	-	2
MNF 421	Joining Processes	3	2	1	2
MNF 412	Industrial Operations Research	3	2	2	-
MNF 462	Industrial Training (1)	3	1	-	4
MNF 422	Computer Numerical Control, CNC, MACHINES	3	2	1	2
MNF 433 MNF 431 MNF 432	Elective-1: a) Production and Operations Management. b) Heat Transfer c) Mechanical Vibrations	3	2	1	2
Total		18	11	5	12

Table 14 Senior 1, Eighth Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MNF 423	Computer Aided Design (CAD)	3	2	1	2
MNF424	Advanced Materials and Composite	3	2	1	2
MNF413	Automatic Control	3	2	1	2
MNF425	Modern Manufacturing Methods	3	2	1	2
GEN354 GEN 353 GEN351	Elective-2: a) Sound systems and Noise Pollution b) Management and International Business, and total quality management. c) Engineering Economy	2	2	-	-
MNF461	Project-1	3	1	-	6
	Total	17	11	4	14

Table 15 Senior 2, Ninth Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MNF521	Computer Aided Manufacturing (CAM)	3	2	-	2
MNF511	Quality Control and Quality Management	3	2	1	2
MNF561	Project-2a	2	1	-	3
MNF522	Hydraulic Power Systems	3	2	1	2
MNF523	Production Aids Design	3	2	1	2
MNF 551 MNF 552 GEN 453	Elective-3: a) Environmental Studies b) Industrial Project Management c) Industrial Psychology	2	2	-	-
MNF 531 MNF 538 MNF 532	Elective-4: a) Modeling and Simulation. b) Advanced Casting Techniques. c) Failure Analysis and Fracture	3	2	1	2
	Total	19	13	4	12

Table 16 Senior 2, Tenth Semester

Code	Course	Hours			
		Cred	Lec	Tut	Lab
MNF 524	Industrial Thermal Systems	3	2	1	2
MNF 553 GEN 454 GEN 352	Elective-5: a) Industrial social impact. b) Basics of Engineering Syndicate Works c) Engineering Laws and Regulations	2	2	-	-
MNF 562	Industrial Training (2)	3	1	-	4
MNF 563	Project-2b	4	1	-	6
MNF 536 MNF 533 MNF 534	Elective-6: a) Industrial Robotics b) Rapid Prototyping c) Automation in Production and CIM	3	2	1	2
MNF 530 MNF 535 MNF 537	Elective-7: a) Advanced Forming Techniques. b) Advanced Facility Planning c) Electro- Hyd.& pneumatic Systems	3	2	1	2
	Total	18	10	3	16

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 **February 2014**. 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	Subject	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
GEN 141	Contemporary Social Issues									1	1														
GEN 142	English Language									1	1														
GEN 143	History of Engineering and Technology	1				1			1	1		1			1										
GEN 241	presentation skills									1	1		1												
GEN 242	Technical Report Writing				1						1	1													
GEN 351	Elective 2	1	1			1		1							1				1						
GEN 453	Elective 3				1					1		1							1	1					
GEN 352	Elective 5					1	1			1	1	1													
GEN 353	Management & International Business						1	1			1		1								1				
GEN 354	Sound System and Noise Pollution	1							1			1													
GEN 454	Basics of Engineering Syndicate Works							1	1	1	1	1		1											
CHE 100	Chemistry	1		1	1	1			1			1	1												
CMP 110	Program Design and Computer Language	1	1		1	1			1					1			1								
MEC 101	Mechanics-1	1	1	1	1																				
MEC 102	Mechanics-2	1	1	1	1	1																			
MTH 101	Math-1 (Algebra and Calculus)	1	1			1																			
MTH 102	Math-2 (Integration and Analytic Geometry)	1		1		1																			
MTH 203	Math-3 (Differential Equations and Transforms)	1	1			1																			
MTH 207	Math-7 (Numerical Analysis)	1				1																			
MTH 305M	Math-5 (Introduction to Probability and Statistics)	1	1			1																			
PHY 101	Physics-1	1	1	1		1	1		1				1												
PHY 102	Physics-2	1		1	1	1								1	1	1									
ELC 316	Electro Engineering	1	1	1	1	1																			
ELC 317	Electric Machines	1	1	1	1	1									1	1	1								
MNF 100	Introduction to Engineering Materials		1	1	1														1						
MNF 101	Eng. Graphics		1		1	1			1		1														
MNF 102	Principles of Production Engineering	1	1		1																				
MNF 211	Mechanics of materials			1	1	1					1			1					1						
MNF 212	Fundamentals of materials Science		1	1	1														1						
MNF 213	Mechanics of Machines-1	1												1											
MNF 214	Machine Drawing-1		1	1	1		1				1			1					1						
MNF 215	Mechanics of Machines-2	1		1	1																				
MNF 216	Machine Drawing-2		1			1	1												1	1					
MNF 311	Fluid Mechanics	1	1	1	1	1								1	1				1	1					
MNF 312	Computer Applications-1			1	1																				
MNF 313	Computer Applications-2	1				1	1		1					1		1	1		1				1		
MNF 314	Thermodynamics	1	1	1	1	1			1				1	1					1						
MNF 411	Mechanical Measurements			1	1																				
MNF 412	Industrial Operations Research	1	1			1							1		1		1								
MNF 413	Automatic Control	1		1	1	1										1									
MNF 511	Quality Control and Quality Management						1								1						1	1			1
MNF 431	Elective 1	1	1	1	1																				
MNF 432	Elective 1	1		1	1	1								1					1						
MNF 433	Elective 1	1				1		1	1											1	1				
MNF 221	Metal Cutting Processes			1					1		1		1	1											
MNF 222	Materials Technology and Testing		1	1	1														1						
MNF 321	Metals Cutting Theory	1		1		1			1		1		1		1										
MNF 322	Machine Design-1		1	1	1														1						
MNF 323	Foundry Technology	1			1				1			1		1					1	1					
MNF 324	Machine Design-2		1	1	1														1						
MNF 325	Engineering Metrology			1	1											1									
MNF 421	Joining Processes	1			1				1					1					1	1					
MNF 422	Computer Numerical Control, CNC Machines	1							1					1		1	1	1				1	1	1	
MNF 423	Computer Aided Design (CAD)	1	1		1				1				1	1	1	1		1	1						
MNF 424	Advanced Materials and Composite			1					1				1	1											1
MNF 425	Modern Manufacturing Methods	1	1	1	1										1	1						1			
MNF 521	Computer Aided Manufacturing (CAM)	1			1	1			1				1	1		1						1	1		
MNF 522	Hydraulic Power Systems	1	1	1	1	1			1																
MNF 523	Production Aids Design	1			1											1			1						
MNF 524	Industrial Thermal Systems				1									1					1						
MNF 531	Elective 4	1		1		1			1							1		1	1						
MNF 532	Elective 4	1		1	1									1					1						1
MNF 533	Elective 6				1				1				1	1				1	1			1			1
MNF 534	Elective 6					1			1			1	1				1					1		1	
MNF 535	Elective 7		1	1	1									1											
MNF 536	Elective 6	1	1	1	1																				

MNF538	Elective 4	1		1	1				1									1	1		1				
MNF 530	Elective 7			1					1				1	1	1						1				
MNF 537	Elective 7	1		1					1				1	1				1			1				
MNF 361	Seminar-1.									1		1		1											
MNF 362	Seminar-2.									1		1		1											
MNF 461	Project-1														1					1					
MNF 462	Industrial Training(1)																	1	1						
MNF 551	Elective 3	1		1	1		1		1	1		1	1						1						
MNF 552	Elective 3	1		1	1						1														
MNF 553	Elective 5					1				1		1			1			1		1					
MNF 561	Project-2a														1					1					
MNF 562	Industrial Training(2)																	1	1						
MNF 563	Project-2b														1					1					

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

Code	Subject	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
GEN 141	Contemporary Social Issues				1					1			1										
GEN 142	English Language				1																		
GEN 143	History of Engineering and Technology	1	1				1	1															
GEN 241	presentation skills													1									
GEN 242	Technical Report Writing				1																		
GEN 351	Elective 2	1	1					1	1					1									
GEN 453	Elective 3			1		1				1													
GEN 352	Elective 5			1	1					1			1										
GEN 353	Management & International Business			1	1	1				1	1												
GEN 354	Sound System and Noise Pollution				1									1		1							
GEN 454	Basics of Engineering Syndicate Works								1	1		1		1									
CHE 100	Chemistry	1	1	1	1		1		1		1		1										
CMP 110	Program Design and Computer Language	1	1	1	1			1					1	1	1			1	1				
MEC 101	Mechanics-1	1	1																				
MEC 102	Mechanics-2	1	1			1								1		1							
MTH 101	Math-1 (Algebra and Calculus)	1	1	1				1															
MTH 102	Math-2 (Integration and Analytic Geometry)	1	1	1	1			1				1											
MTH 203	Math-3 (Differential Equations and Transforms)	1	1	1				1															
MTH 207	Math-7 (Numerical Analysis)	1	1	1								1											
MTH 305M	Math-5 (Introduction to Probability and Statistics)	1	1	1				1				1											
PHY 101	Physics-1	1	1	1				1															
PHY 102	Physics-2		1	1	1	1	1							1		1							
ELC 316	Electro Engineering	1	1			1				1				1	1	1							
ELC 317	Electric Machines		1	1			1			1		1											
MNF 100	Introduction to Engineering Materials	1	1			1								1		1		1					
MNF 101	Eng. Graphics			1		1		1	1	1													
MNF 102	Principles of Production Engineering		1	1							1								1				
MNF 211	Mechanics of materials					1	1	1						1	1			1					
MNF 212	Fundamentals of materials Science	1	1			1								1		1		1					
MNF 213	Mechanics of Machines-1	1												1									
MNF 214	Machine Drawing-1			1	1				1									1					
MNF 215	Mechanics of Machines-2	1				1								1	1	1							
MNF 216	Machine Drawing-2			1	1				1									1					
MNF 311	Fluid Mechanics	1	1					1						1				1					
MNF 312	Computer Applications-1			1	1				1									1					
MNF 313	Computer Applications-2							1						1					1				1
MNF 314	Thermodynamics	1	1	1		1								1				1					
MNF 411	Mechanical Measurements				1	1			1		1						1				1		
MNF 412	Industrial Operations Research	1	1	1				1	1			1		1				1					
MNF 413	Automatic Control	1				1								1		1							
MNF 511	Quality Control and Quality Management				1	1						1											
MNF 431	Elective 1	1	1			1								1			1						
MNF 432	Elective 1	1	1											1									
MNF 433	Elective 1							1	1							1			1				
MNF 221	Metal Cutting Processes			1						1			1			1							
MNF 222	Materials Technology and Testing	1	1			1								1		1		1		1			
MNF 321	Metals Cutting Theory	1		1						1			1					1	1				
MNF 322	Machine Design-1		1			1	1							1									
MNF 323	Foundry Technology	1	1	1		1	1							1		1							
MNF 324	Machine Design-2		1			1	1							1									
MNF 325	Engineering Metrology				1	1			1			1			1		1				1		
MNF 421	Joining Processes		1	1		1	1							1			1					1	1
MNF 422	Computer Numerical Control, CNC MACHINES	1	1	1															1				
MNF 423	Computer Aided Design (CAD)	1	1	1		1			1			1		1		1							
MNF 424	Advanced Materials and Composite		1	1				1					1					1	1	1			
MNF 425	Modern Manufacturing Methods		1							1	1				1				1				
MNF 521	Computer Aided Manufacturing (CAM)	1	1	1		1			1					1				1					
MNF 522	Hydraulic Power Systems	1	1			1				1				1	1	1							
MNF 523	Production Aids Design	1	1	1															1				
MNF 524	Industrial Thermal Systems	1	1				1							1									
MNF 535	Elective 7	1		1		1																	1
MNF 538	Elective 4	1		1	1	1	1		1	1			1		1				1				1
MNF537	Elective 7	1				1				1				1	1			1					

MNF 531	Elective 4	1	1	1		1		1				1		1				1					
MNF 532	Elective 4						1					1											
MNF 533	Elective 6		1	1		1																	
MNF 530	Elective 7	1			1				1						1	1			1				
MNF 551	Elective 3	1	1		1							1				1	1	1					
MNF 552	Elective 3									1													
MNF 553	Elective 5	1	1							1	1			1	1		1						
MNF 361	Seminar-1.		1					1		1	1												
MNF 362	Seminar-2.		1					1		1	1												
MNF 461	Project-1	1		1									1						1				
MNF 462	Industrial Training(1)				1							1											
MNF 561	Project-2a	1		1									1						1				
MNF 562	Industrial Training(2)				1							1											
MNF 563	Project-2b	1		1									1						1				
MNF 534	Elective 6	1	1											1	1		1		1				1
MNF 536	Elective 6	1	1			1								1			1			1			

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

Code	Subject	Professional and practical skills **C's**																					
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
GEN 141	Contemporary Social Issues	1				1																	
GEN 142	English Language											1	1										
GEN 143	History of Engineering and Technology	1				1																	
GEN 241	presentation skills											1											
GEN 242	Technical Report Writing		1		1								1	1									
GEN 351	Elective 2	1				1		1		1													
GEN 453	Elective 3		1		1				1														
GEN 352	Elective 5	1				1				1													
GEN 353	Management & International Business	1				1																	
GEN 354	Sound System and Noise Pollution			3													1						
GEN 454	Basics of Engineering Syndicate Works										1	1	1	1									
CHE 100	Chemistry	1	1	1		1			1				1										
CMP 110	Program Design and Computer Language	1	1	1	1	1	1	1							1	1							
MEC 101	Mechanics-1	1	1																				
MEC 102	Mechanics-2	1		1		1																	
MTH 101	Math-1 (Algebra and Calculus)	1											1										
MTH 102	Math-2 (Integration and Analytic Geometry)	1						1															
MTH 203	Math-3 (Differential Equations and Transforms)	1											1										
MTH 207	Math-7 (Numerical Analysis)	1				1		1															
MTH 305M	Math-5 (Introduction to Probability and Statistics)	1	1										1										
PHY 101	Physics-1	1	1			1						1											
PHY 102	Physics-2	1				1			1			1			1								
ELC 316	Electro Engineering	1		1		1	1						1				1	1					
ELC 317	Electric Machines	1			1	1			1														
MNF 100	Introduction to Engineering Materials	1	1																	1			
MNF 101	Eng. Graphics		1	1	1							1		1									
MNF 102	Principles of Production Engineering	1		1				1															
MNF 211	Mechanics of materials	1		1		1			1				1										
MNF 212	Fundamentals of materials Science	1	1																	1			
MNF 213	Mechanics of Machines-1	1																					
MNF 214	Machine Drawing-1	1	1	1							1				1								
MNF 215	Mechanics of Machines-2	1		1		1	1		1			1											
MNF 216	Machine Drawing-2	1	1								1			1	1								
MNF 311	Fluid Mechanics		1	1		1							1				1	1					
MNF 312	Computer Applications-1	1	1	1							1				1		1						1
MNF 313	Computer Applications-2	1	1			1			1		1				1	1		1				1	1
MNF 314	Thermodynamics	1	1			1						1	1				1	1		1			
MNF 411	Mechanical Measurements		1	1		1											1						
MNF 412	Industrial Operations Research	1	1					1	1				1					1					
MNF 413	Automatic Control	1				1											1	1					
MNF 511	Quality Control and Quality Management										1							1					
MNF 431	Elective 1	1				1	1	1									1						
MNF 432	Elective 1	1	1	1														1					
MNF 433	Elective 1	1	1																	1			
MNF 221	Metal Cutting Processes						1		1			1				1				1			
MNF 222	Materials Technology and Testing	1	1																	1			
MNF 321	Metals Cutting Theory	1	1			1	1		1				1					1					
MNF 322	Machine Design-1	1		1									1	1									
MNF 323	Foundry Technology	1		1		1	1						1	1			1	1					
MNF 324	Machine Design-2	1		1									1	1									
MNF 325	Engineering Metrology		1	1		1											1						
MNF 421	Joining Processes	1		1		1	1						1	1			1	1					1
MNF 422	Computer Numerical Control, CNC MACHINES					1									1	1		1	1				
MNF 423	Computer Aided Design (CAD)	1	1																				
MNF 424	Advanced Materials and Composite			1		1			1							1		1		1		1	1
MNF 425	Modern Manufacturing Methods														1	1	1	1	1				
MNF 521	Computer Aided Manufacturing (CAM)	1	1			1	1			1	1		1		1			1					
MNF 522	Hydraulic Power Systems	1		1		1	1						1				1	1					
MNF 523	Production Aids Design	1		1																			
MNF 524	Industrial Thermal Systems	1	1	1														1					
MNF 531	Elective 4	1				1	1	1										1		1			
MNF 532	Elective 4				1												1	1					
MNF 533	Elective 6		1	1						1		1			1							1	
MNF 534	Elective 6					1	1	1							1								1
MNF 535	Elective 7	1	1	1		1	1														1		
MNF 536	Elective 6	1				1	1	1									1						

MNF 537	Elective 7	1	1	1		1	1						1	1				1					
MNF 538	Elective 4	1		1		1	1						1	1			1	1				1	
MNF 530	Elective 7		1	1			1										1	1			1		
MNF 361	Seminar-1.	1	1							1													
MNF 362	Seminar-2.	1	1							1													
MNF 461	Project-1	1	1			1				1			1	1			1		1				
MNF 462	Industrial Training(1)	1														1			1	1			
MNF 551	Elective 3									1		1	1										
MNF 552	Elective 3									1													
MNF 553	Elective 5	1	1	1		1	1	1					1										
MNF 561	Project-2a	1	1			1				1			1	1			1		1				
MNF 562	Industrial Training(2)	1														1			1	1			
MNF 563	Project-2b	1	1			1				1			1	1			1		1				

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

Code	Subject	General and transferable skills **(D)**								
		01	02	03	04	05	06	07	08	09
GEN 141	Contemporary Social Issues	1		1				1		1
GEN 142	English Language	1	1	1	1		1	1	1	
GEN 143	History of Engineering and Technology	1						1	1	
GEN 241	presentation skills	1	1	1		1		1		
GEN 242	Technical Report Writing						1		1	
GEN 351	Elective 2	1	1	1				1		1
GEN 453	Elective 3	1	1				1			1
GEN 352	Elective 5	1		1				1		1
GEN 353	Management & International Business	1		1				1		1
GEN 354	Sound System and Noise Pollution	1		1					1	
GEN 454	Basics of Engineering Syndicate Works	1	1	1			1	1		
CHE 100	Chemistry	1	1	1	1	1		1		
CMP 110	Program Design and Computer Language	1		1	1	1		1		1
MEC 101	Mechanics-1	1	1							
MEC 102	Mechanics-2	1	1							
MTH 101	Math-1 (Algebra and Calculus)			1				1		
MTH 102	Math-2 (Integration and Analytic Geometry)	1		1				1		
MTH 203	Math-3 (Differential Equations and Transforms)			1				1		
MTH 207	Math-7 (Numerical Analysis)			1	1			1		
MTH 305M	Math-5 (Introduction to Probability and Statistics)			1				1		
PHY 101	Physics-1	1	1	1	1		1			1
PHY 102	Physics-2	1		1	1	1		1		
ELC 316	Electro Engineering	1		1				1		1
ELC 317	Electric Machines		1	1			1	1		
MNF 100	Introduction to Engineering Materials	1		1				1		1
MNF 101	Eng. Graphics	1		1						1
MNF 102	Principles of Production Engineering	1		1				1		1
MNF 211	Mechanics of materials	1		1						1
MNF 212	Fundamentals of materials Science	1		1				1		1
MNF 213	Mechanics of Machines-1	1		1				1		1
MNF 214	Machine Drawing-1	1		1						1
MNF 215	Mechanics of Machines-2	1		1				1		
MNF 216	Machine Drawing-2	1				1				1
MNF 221	Metal Cutting Processes	1		1				1		1
MNF 222	Materials Technology and Testing	1		1				1		1
MNF 311	Fluid Mechanics	1	1	1		1				
MNF 312	Computer Applications-1	1		1						1
MNF 313	Computer Applications-2	1			1					
MNF 314	Thermodynamics	1		1				1	1	
MNF 321	Metals Cutting Theory	1		1				1		1
MNF 322	Machine Design-1		1	1				1		1
MNF 323	Foundry Technology	1		1				1		1
MNF 324	Machine Design-2		1	1				1		1
MNF 325	Engineering Metrology		1							
MNF 361	Seminar-1.			1			1	1		
MNF 362	Seminar-2.			1			1	1		
MNF 411	Mechanical Measurements		1							
MNF 412	Industrial Operations Research	1		1			1	1		1
MNF 413	Automatic Control			1	1			1		
MNF 421	Joining Processes	1		1				1		1
MNF 422	Computer Numerical Control, CNC MACHINES	1		1			1			
MNF 423	Computer Aided Design (CAD)				1	1				
MNF 424	Advanced Materials and Composite			1	1			1	1	1
MNF 425	Modern Manufacturing Methods	1		1	1			1		1
MNF 431	Elective 1	1		1				1		1
MNF 432	Elective 1	1		1				1		1
MNF 433	Elective 1	1		1				1		1
MNF 461	Project-1			1			1	1		
MNF 462	Industrial Training(1)			1			1	1		
MNF 511	Quality Control and Quality Management	1		1				1		
MNF 521	Computer Aided Manufacturing (CAM)	1			1					
MNF 522	Hydraulic Power Systems	1		1	1			1		1
MNF 523	Production Aids Design	1		1				1		1
MNF 524	Industrial Thermal Systems	1		1				1		1
MNF 530	Elective 7	1		1				1		
MNF 531	Elective 4	1		1	1		1			
MNF 532	Elective 4	1						1		1
MNF 533	Elective 6	1		1	1					
MNF 534	Elective 6	1		1	1			1		1
MNF 535	Elective 7		1	1	1					1

MNF 536	Elective 6	1		1				1		1
MNF 537	Elective 7	1		1	1			1		1
MNF 538	Elective 4	1		1				1		1
MNF 551	Elective 3	1	1	1			1			
MNF 552	Elective 3	1		1			1	1		1
MNF 553	Elective 5	1		1	1			1		1
MNF 561	Project-2a			1			1	1		
MNF 562	Industrial Training(2)			1			1	1		
MNF 563	Project-2b			1			1	1		

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

Appendix 2

Courses Specifications

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

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

SN	Course Code	Course Title
1.	CHE 100	Chemistry
2.	CMP 110	Program Design and Computer Language
3.	GEN 141	Contemporary Social Issues
4.	GEN 142	English Language
5.	GEN 143	History of Engineering and Technology
6.	MEC 101	Mechanics-1
7.	MEC 102	Mechanics-2
8.	MNF 100	Introduction to Engineering Materials
9.	MNF 101	Eng. Graphics
10.	MNF 102	Principles of Production Engineering
11.	MTH 101	Math-1 (Algebra and Calculus)
12.	MTH 102	Math-2 (Integration and Analytic Geometry)
13.	PHY 101	Physics-1
14.	PHY 102	Physics-2
15.	GEN 241	presentation skills
16.	GEN 242	Technical Report Writing
17.	MNF 211	Mechanics of materials
18.	MNF 212	Fundamentals of materials Science
19.	MNF 213	Mechanics of Machines-1
20.	MNF 214	Machine Drawing-1
21.	MNF 215	Mechanics of Machines-2
22.	MNF 216	Machine Drawing-2
23.	MNF 221	Metal Cutting Processes
24.	MNF 222	Materials Technology and Testing
25.	MTH 203	Math-3 (Differential Equations and Transforms)
26.	MTH 207	Math-7 (Numerical Analysis)
27.	ELC 316	Electro Engineering
28.	ELC 317	Electric Machines
29.	GEN 351	Engineering Economy
30.	GEN 352	Engineering Laws and Regulations
31.	GEN 353	Management and International Business and total quality management
32.	GEN 354	Sound systems and Noise Pollution
33.	MNF 311	Fluid Mechanics
34.	MNF 312	Computer Applications-1
35.	MNF 313	Computer Applications-2
36.	MNF 314	Thermodynamics
37.	MNF 321	Metals Cutting Theory
38.	MNF 322	Machine Design-1
39.	MNF 323	Foundry Technology
40.	MNF 324	Machine Design-2
41.	MNF 325	Engineering Metrology
42.	MNF 361	Seminar-1.
43.	MNF 362	Seminar-2.
44.	MTH 305M	Math-5 (Introduction to Probability and Statistics)
45.	GEN 453	Industrial Psychology
46.	GEN 454	Basics of Engineering Syndicate Works
47.	MNF 411	Mechanical Measurements
48.	MNF 412	Industrial Operations Research

49.	MNF 413	Automatic Control
50.	MNF 421	Joining Processes
51.	MNF 422	Computer Numerical Control, CNC MACHINES
52.	MNF 423	Computer Aided Design (CAD)
53.	MNF 424	Advanced Materials and Composite
54.	MNF 425	Modern Manufacturing Methods
55.	MNF 431	Heat Transfer
56.	MNF 432	Mechanical Vibrations
57.	MNF 433	Production and Operations Management.
58.	MNF 461	Project-1
59.	MNF 462	Industrial Training(1)
60.	MNF 511	Quality Control and Quality Management
61.	MNF 521	Computer Aided Manufacturing (CAM)
62.	MNF 522	Hydraulic Power Systems
63.	MNF 523	Production Aids Design
64.	MNF 524	Industrial Thermal Systems
65.	MNF 530	Advanced Forming Techniques
66.	MNF 531	Modeling and Simulation
67.	MNF 532	Failure Analysis and Fracture
68.	MNF 533	Rapid Prototyping
69.	MNF 534	Automation in Production and CIM
70.	MNF 535	Advanced Facility Planning
71.	MNF 536	Industrial Robotics
72.	MNF 537	Electro- Hyd. and Pneumatic Systems
73.	MNF 538	Advanced casting techniques.
74.	MNF 551	Environmental Studies
75.	MNF 552	Industrial Project Management
76.	MNF 553	Industrial Social Impact
77.	MNF 561	Project-2a
78.	MNF 562	Industrial Training(2)
79.	MNF 563	Project-2b

Modern Academy for Engineering and Technology in Maadi

Course Specification
CHE 100: Chemistry

A- Affiliation

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

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

Department offering the course: Basic Science Department.

Date of specifications approval: September 2015

B - Basic information

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

C - Professional information

1 - Course Learning Objectives:

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

2 - Intended Learning Outcome

a - Knowledge and understanding:

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

a1- Theoretical background to identify the difference between gas and liquids states of matter . (A1,A3)
a2- Construction, operation and characteristics of basic component of refrigerator and heat pump.(A1,A4)
a3- Theoretical back ground of electrochemistry needed to know construction , operation and characteristics of different batteries and its problems . (A5,A4,A8,A11,A12)
a4-The aspects lead to corrosion of metal and knowing how it can controlled. (A5,A6,A11,A12)
a5- Theoretical back ground of solutions and their applications . (A1,A3)
a6- Theories relevant to thermochemistry and its application in solar heating system and Rocket propulsion . (A1,A4,A8,A11,A12)
a7- Basic principles for fuel classification and knowing its optimum characteristics , also identify advantage and disadvantage of them (A1,A5,A6,A11,A12)
a8- Scientific principle of petroleum extraction and refining . (A1,A3,A4,A7)
a9- The impacts of environmental pollution, knowing sources of pollutant and how it can be controlled. (A6,A11,A12)
a10- Technology supporting water treatments and desalination techniques (A4,A6,A11)
a11- New trends in energy resources ,identify the advantage and disadvantage of each of them . (A1,A4,A5,A6,A8,A11,A12)
a12- Some chemical industries in different fields such as eng. practices and regulatory farm works in chem. Eng. Industry. (A3,A4,A5,A6 ,A8,A11,A12)

b - Intellectual skills:

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

b1- Apply chemistry principles and analytical thinking to problems of gases , liquids , solutions, fuels ,thermochemistry ,electrochemistry , water treatment 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- Incorporate different scientific subjects to reach a new scientific system with a better quality . (B1,B3,B4,B12,B10)
b5- Think in a creative new scientific 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 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- Apply knowledge of 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 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 . (D5)
d4-Use library information in subjects . (D1)
d5- Use the E-mail for communication . (D3,D4,D7)

Course Contribution in the Program ILO's

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

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentation	Discussions	Tutorials	Problem	Laboratory &					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			
	a6	1										1				1			1	1			
	a7	1		1	1	1						1	1			1			1				
	a8	1														1							
	a9	1		1								1				1							
	a10	1		1												1							
	a11	1											1			1							
	a12	1	1									1				1							
Intellectual Skills	b1	1			1											1		1		1			
	b2	1			1	1										1		1	1	1			
	b3	1	1	1	1		1					1				1	1		1				
	b4	1	1		1		1					1				1	1	1	1	1			
	b5	1																					
	b6	1																					
	b7	1																					
	b8	1										**1**				1							
Applied Professional Skills	c1	1	1		1	1	1									1	1	1	1	1			
	c2	1			1											1		1	1	1			
	c3	1		1		1						1	1						1	1			
	c4	1			1	1											1		1	1			
	c5						1										1						
	c6						1										1	1					
	c7																1	1					
	c8																						
	c9																1	1					
	c10																						
General Tran. Skills	d1			1		1						1							1				
	d2		1	1								1	1						1				
	d3	1	1									1							1	1			
	d4	1	1	1								1											
	d5																						

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

- Chemistry for engineering & applied sciences.
- Chemistry for engineering & applied sciences.

6-2 Required books:

1- Frank R. Foulkes,"Physical Chemistry for Engineering and Applied Sciences", CRC Press, 2012

2- W. Steedman, R. B. Snadden, Iain Howe Anderson, Chemistry for the engineering and applied sciences,

Pergamon Press, 1980

6-4 Recommended books: Non

6-4 Periodicals, Web sites, etc

7- Facilities required for teaching and learning:

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

Course coordinator: Assist. Prof. Shaaban Ragab Gouda
Head of the Department: **Prof.** Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
CMP 110:Program Design and Computer Languages

A- Affiliation

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

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

Department offering the course: Computer Engineering and Information Technology Department

Date of specifications approval: September 2015

B - Basic Information

Title: Program Design and Computer Languages **Code:** CMP110 **Year/level:** Freshman, First Semester

Credit Hours: **Lectures:** 2 **Tutorial:** 3
Practical: 2 **Total:** 4

C - Professional Information

1 – Course Learning Objectives:

The objective of this course is to enable the students to understand the concepts of programming, the steps of how to solve a problem either using flowcharts or using the C++ programming language, aiming to teach the students how to develop and enhance programming concepts and skills 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,A5).
a2- Program structure in C++ (A4).
a3- Data types, Data declaration(Variables and Constants) in C++ (A16).
a4- Different Categories of Operators and their precedence in C++ (A1, A13).
a5- Control Structures in C++ (Decision and Loop Constructs) (A5).
a6- Arrays, Pointers, References, and dynamic allocation (A16).
a7- Functions and types of calling (by value, by reference) in C++ (A4, A16).
a8- Structures, Unions, Enumeration, User-defined data types and ADT (Abstract Data Types) (A4,A16).
a9- Object-Oriented Programming (OOP) concepts and terminologies (A4, A5, A8, A13, A16).
a10- Input and Output Files (File I/O s), I/O stream, strings and recursion(A5, A16).

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,B2,B3,B4).
b2-**Manipulate** different data types (B7,B14).
b3- **Analyze** the problem required to be solved and **design** the appropriate C++ program to solve this problem (B13)
b4-**Manipulate** the different control structures, **investigate** decisions and loops suitable for solving the problem
b5- **Manipulate** different C++ structures (Arrays, Structures, Unions and Classes) for different problems(B3,B12
b6-**Investigate** on the new programming interface and **develop** to the Object- Oriented Programming concep (B17, B18).
b7-**Manipulate** input and output files (for reading from and writing into these files respectively) (B4).

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).
c3-**Solve** different engineering problems related to the artificial intelligent systems, microcontroller systems, operating systems and their basic elements(C1,C5,C6,C7,C15).
c4- **Design** and **implement** C++different structures (C2,C4).
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, 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, A16
B	Intellectual skills	B1, B2, B3,B4,B7,B12, B13, B14, B17,B18
C	Professional and practical skills	C1, C2,C3,C4,C5, C6, C7,C14,C15
D	General and transferable skills	D1, D3, D4, D5,D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Steps for solving programs by computer programs	**2**	**3**	**2**
➢ Program documentation and flow charts	**2**	**3**	**2**
➢ Program structure in C++	**1**	**2**	**1**
➢ Data types and declaration in C++	**2**	**2**	**2**
➢ Input/output in C++ and I/O stream class	**1**	**2**	**1**
➢ I/O manipulation	**1**	**2**	**1**
➢ Operators and precedence in C++	**2**	**3**	**2**
➢ Decision (selection) constructs in C++	**2**	**3**	**2**
➢ Loops (iterations) in C++	**2**	**3**	**2**
➢ Arrays, Pointers, References, and dynamic allocation	**2**	**3**	**2**
➢ Functions in C++, calling functions (by value, by reference)	**2**	**3**	**2**
➢ Structures, Unions, Enumeration, and user-defined data types	**2**	**3**	**2**
➢ Abstract data types (ADT)	**1**	**2**	**1**
➢ Concepts and Terminologies of Object-Oriented Programming (OOP)	**2**	**2**	**2**
➢ Classes and objects	**2**	**2**	**2**
➢ Constructors, destructors, friend functions	**1**	**2**	**1**
➢ Polymorphism, encapsulation, inheritance	**1**	**2**	**1**
➢ File I/O, I/O stream, strings, recursion	**2**	**3**	**2**
Total hours	**30**	**45**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations	Discussions and	Tutorials	Problem solving	Laboratory &					Researches and	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	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						1				1	1	1	1			
	c2	1	1	1	1	1						1				1		1	1	1			
	c3	1	1	1	1	1						1	1			1		1	1	1			
	c4	1	1	1	1		1					1	1			1	1	1	1	1			
	c5	1	1	1	1		1					1	1			1	1	1	1	1			
General Transf. Skills	d1	1	1	1	1	1						1	1					1	1	1			
	d2	1	1	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	1	1	1			
	d5		1	1			1						1			1	1	1	1	1			

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

Lecture notes and handouts

6-2 Required books

- Walter Savitch, "Problem Solving With C++", Pearson Education Inc., 2006.
- Deitel & Deitel, "C++ How To program", Prentice Hall, 2001.
- Al Stevens, "C++ Programming Bible", IDG, 2000.

6-3 Recommended books:

- C++ Essentials, Sharam Hekmat, PragSoft Corporation,www.pragsoft.com, 2005

6-4 Periodicals, Web sites, etc.:

http://www.cplusplus.com/ .

7- Facilities required for teaching and learning:

- Computer Lab.
- Computer, Data show and Computer package (Microsoft Visual Studio 2010 or 2012).

Course coordinator: Dr. Ehab ElShimy
Head of the Department: Dr. Said Gawish
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
قضايا اجتماعية معاصرة :GEN 141

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 2015

B - Basic Information

Title:قضايا اجتماعية معاصرة **Code: GEN 141** **Level:** freshman, First Semester

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

Pre-requisite: non

C - Professional information

1 – Course Learning Objectives:

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

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- الانتماء و أهميته و أصول المجتمع و العادات والتقاليد المرعية (A9, A10)

a2- بناء الأسرة و تكوينه او التنشئة الاجتماعية (A9, A10)

a3- العمل الجماعي و أهمية عمل الفريق و الفارق بين العمل الجماعي والفريقى و كيفية إعداد القادة (A9, A10)

b - Intellectual skills:

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

b1- ان يتعلم الطالب مفهوم الانتماء والعادات والتقاليد واصول المجتمع (B4, B9, B12)

b2- ان يدرك الطالب علي اهمية الاسره والتنشئه الاجتماعيه (B4, B9)

b3- ان يتعلم مهارات العمل الجماعي واهمية عمل الفريق والفرق بين العمل الجماعي والفردي (B4, B12)

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).

c - Professional and practical skills:

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

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

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method								
		Lecture	Presentations	Discussions	Tutorials	Problem	Laboratory &					Researches	Modeling and			Written Exam	Practical	Quizzes	Term papers	Assignments				
Knowledge &	a1	1	1	1								1				1		1						
	a2	1				1										1		1		1				
	a3	1														1		1		1				
Intellectual Skills	b1	**1**														1		1		**1**				
	b2	**1**				**1**										1		1		**1**				
	b3	**1**	**1**	**1**								**1**				1								
Professional skills	c1	1	1		1							1				1		1		1				
General Tran	d1	1		1		1						1												
	d2	1	1	1																				
	d3	1	1																	1				

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Non

6-2 Required books

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

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. Shimaa Nabih Ebrahim Esmail
Head of the Department: Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 142: English Language

A- Affiliation

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

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 2015

B - BASIC INFORMATION

Title: English Language **Code:** GEN 142 **Level:** Freshmen, Fist Term
Credit Hours: 2 **Lectures:** 2 **Tutorial/Exercise:** **Practical:**
Pre-requisite: -

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

b - Intellectual skills:

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

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c 1) Write paragraphs and peer edit them using error detection. (C12)
c 2) communicate with each other and with the professor. (C11)
c 3) Use different tenses in conversation. (C11)
c 4) Brainstorm ideas for homework writing. (C12)

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1- Work in a team and involve in group discussion. (D1), (D2), (D3)
d2- Communicate effectively and present data and results orally and in written form. (D1), (D2), (D3), (D6)
d3- communicate effectively in written and oral forms. (D3), (D7)
d4- Search for information's in references and in internet. (D4), (D7)
d5- Practice self-learning. (D4), (D7), (D8)

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Computer Hackers	2		
At the Doctor's Reviewing tenses Reading Speaking: role play Assignment: Write 5 lines giving advice on how to improve your English/study skills/social life.	2		
At the Doctor's(to be continued) Grammar: perfect tenses& prefixes Speaking: role play Assignment: Write a letter to your friend advising him/ her about healthy habits.&pp.	2		
Global Warming Reading Speaking : English communication skills Suffixes & adj.&adv. Peer editing	2		
Computer Addiction Reading: 53-55 Seaking: discussing the topic Grammar: adjectives Assignment:	2		
Earthquake Reading: 59-61 Grammar: Suffixes Speaking: role play Assignment:	2		
Words and their Stories Reading Grammar: wh-questions and negatives Speaking: practice making questions Assignment:	2		
Revision **7th week Exam**	2		
Describing People &Things **Reading :** **Grammar:** adj.& adv. Speaking : English communication skills	2		
Describing People &Things (to be contiued) **Reading :** **Grammar : relative clauses** Speaking : English communication skills	2		
Qualities and Flaws Speak**:** discussing qualities and flaws of each one (pair work **Grammar:** Possession Pronouns+ Adjectives	2		
Qualities and Flaws (to be continued)	2		

List. & Speak: discussing the topic Speaking : English communication skills **Grammar:** Comparative & superlative			
People Idioms **Grammar:** gerund "& to infinitive & adjectives with prepositions Speaking : English communication skills	2		
English proverbs **Grammar: problem verbs** Speaking : English communication skills	2		
Revision	2		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method								
		Lecture	Warming up	Discussions	Tutorials	Problem						Researches	Modeling			Written		Quizzes	Class	Assignments				
Knowledge & Understanding	a1	1	1	1								1	1			1	1	1	1	1				
	a2	1	1	1								1	1			1	1	1	1	1				
	a3	1	1	1								1	1			1	1	1	1	1				
Intellectual Skills	b1	1	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 Prof. Skills	c1	1	1	1								1	1			1	1	1	1	1				
	c2	1	1	1								1	1			1	1	1	1	1				
	c3	1	1	1								1	1			1	1	1	1	1				
	c4	1	1	1								1	1			1	1	1	1	1				
General Tran. Skills	d1	1	1	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					

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

The English Language Book by Dr Neveen Samir , 2013

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.: Non

7- Facilities required for teaching and learning:

Library and Internet

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 143: History of Engineering and Technology

A- Affiliation

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

B - Basic Information

Title: : History of Engineering and Technology **Code:** GEN143 **Level:** Level 1 , First Semester

Credit Hours: 2 **Lectures:** 2 **Tutorial/Exercise:** 0 **Practical:** 0

Pre-requisite: --

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

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

a3مفهوم التعليم الهندسى ومجالات العمل للمهندسين وكيفيه القيد والتسجيل بنقابه المهندسين وكذا حقوق وواجبات المهندس(A9, A1)

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

b - Intellectual skills:

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

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

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

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

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

c - Professional and practical skills:

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

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

d - General and transferable skills:

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

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

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

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

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

Course Contribution in the Program ILO's

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

3 – Contents

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

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

5- Assessment Timing and Grading:

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

6- List of references:

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

تاريخ علم الهندسة الرياضية العربية الاسلامية، مؤسسة الرسالة، القاهرة ، ٢٠٠٧

6-1 Course notes: non

6-2 Required books: non

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning: Data show – computer

Course coordinator: **ا.م.د/ شعبان رجب**
Head of the Department: **ا. د/ ليلى ابراهيم سليمان**
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MEC 101: Mechanics-1

A- Affiliation

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

Department offering the program: 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 2015

B - Basic Information

Title: Mechanics-1 **Code:** MEC 101 **Level:** Freshman, First Semester
Credit Hours: 3 **Lectures:** 1 **Tutorial/Exercise:** 3
Pre-requisite: non

C - Professional Information

1 – Course Learning Objectives:

A study of this course will enable the student to gain and apply the basic concepts of statics in plane and space (force resultant equilibrium analysis of structures) and recognize their application in engineering sciences.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- basic of statics in plane and space. (A1, A2, A3)
a2- the difference between the moment of force in plane and space. . (A2, A3, A4)
a3- Classification of support reaction in plane and in space. . (A3, A4)
a4- the structural analysis in plane. . (A3, A4)

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Analyze and classify between equilibrium in plane and equilibrium in space. (B1, B2)
b2- Classify and compare the different between equilibrium of a single rigid body and all forces involved were external to the rigid body. (B1, B2)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Solve the equations of equilibrium to get three unknowns. (C1, 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)
d2- Search for information in references and in internet. (D1, D2)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4
B	Intellectual skills	B1, B2
C	Professional and Practical 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)	2	4
Different types of support in plane	1	3
Distributed loads	1	3
Equilibrium of rigid body in plane	1	2
Different types of supports in space	1	4
Equilibrium of rigid body in space	2	4
Special cases of two, three and four force members	1	4
Analysis of Trusses by the method of joints	1	4
Analysis of Trusses by the method of section	1	4
Final revision	1	4
Total hours	**15**	**45**

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: found

6-2 Required books :

Beer and Johnston, Vector Mechanics for Engineers- Statics, 10th Edition, New York, 2015

.

6-3 Recommended books:

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

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

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MEC 102: Mechanics-2

A- Affiliation

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

Department offering the program: 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 2015

B - Basic Information

Title: Mechanics-2 **Code:** MEC 102 **Level:** Freshman, Second Semester

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

Pre-requisite: MEC 101

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Basic of dynamics like velocity, acceleration, total distance, average velocity and average speed.(A1, A2)
a2- definition of differentiation and integration (A3)
a3- Classification the particle's motion in straight line and in curved path and it's applications (A3)
a4- 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, B13)
b2- Classify and compare the different between the average velocity and average speed (B2,B5,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.(C5)

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.
d2- Search for information in references and in internet (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, B13, B15
C	Professional and Practical Skills	C1,C3, C5
D	General and transferable skills	D1, D2

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:
6-1 Course notes: found
6-2 Required books:
F. Beer and Johnston Vector mechanics for Engineers, Dynamics, McGraw-Hill, New York, 9th Ed. , 2009.
R.C. Hibbeler Engineering mechanics, Dynamics.
6-3 Recommended books: Non

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF100: Introduction to Engineering Materials

A- Affiliation

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

Department offering the program: 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 2015

B - Basic Information

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

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

Pre-requisite: -

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Basic information of atomic structure (A2)
a2- Characteristics of engineering materials related to the discipline (A3).
a3- Principles of ferrous and non-ferrous alloys (A4)
a4- Basic properties of copper and aluminum alloys (A3).
a5- Engineering design principles for selection of material (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	8		
3-1 Copper and its alloys			
3-2 Aluminum and its alloys			
4- Other engineering alloys	3		
5- Selection of Materials			
Total hours	**15**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method								
		Lecture	Presentations	Discussions	Tutorials	Problem	Laboratory &					Researches	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, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	8-th Week	10
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes: Introduction to Engineering Material (Lecture Notes)
6-2 Required books : David G. Rethwisch, "Fundamentals of Materials Science and Engineering", Wiley, Asia,2013
6-3 Recommended books: William D. Callister**, "**Fundamentals of Materials Science and Engineering", Wiley, USA, 2005

6-4 Periodicals, Web sites, etc.

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

7- Facilities required for teaching and learning:

- Lecture Room
- Computer, Data show.

Course coordinator: Dr. Nasr Aref
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF101: 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 2015

B - Basic Information

Title: Engineering Graphics **Code:** MNF101 **Year/level:** freshman, first semester
Credit Hours:٣ **Lectures:** 1 **Tutorial:**6 **Practical:** -
Pre-requisite: Non

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

B - Intellectual skills

By the end of the course the student should be able to:
b1- Solve and communicate problems in orthographic views. [B7]
b2- Solve and communicate problems in isometric and oblique drawings. [B7]
b3- Consider the benefits of solving problems of developments and intersections. .[B5]
b4- Draw different problems in sectional views. [B7]
b5- Select the proper section for each component. [B8]
b6- Draw dimensions for components from production point of view. [B٣]

C - Professional and practical skills

By the end of the course the student should be able to:
c1- Produce orthographic views from 3D models. [C2]
c2- Read and understand orthographic drawing. [C3]
c3- Prepare and interpret engineering drawing. [C4]
c4- Read orthographic drawing with sectional views. [C4], [C11]
c5- Make necessary views using sections and dimensioning. [C4], [C13]
c6- Communicate by graphic language. [C4]

D - General and transferable skills

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

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours
Drawing instruments , Draw sheets ; Scales; Folding Lettering	1	6
Geometric Construction	1	6
Alphabet of lines	1	6
Theory of orthographic projection: Projection of point ; line and plane Projection of geometric solids	1	6
Multi view drawing (of Vertical and Horizontal Surfaces)	1	٦
Multi view drawing (of inclined Surfaces)	1	6
Multi view drawing (of cylindrical Surfaces)	1	6
Pictorial drawing (isometric) , Pictorial drawing (oblique)	1	٦
Isometric drawing (of Vertical, Horizontal & inclined Surfaces)	1	6
Isometric drawing (of cylindrical Surfaces)	1	6
Conventional practice in ED	١	٦
Importance of drawing sections ; Basic types of sections: Full sections : longitudinal ,cross – section	1	٦
Off set ; Aligned sections ; Half-section ;Partial S.; Revolved & Auxiliary sections.	1	٦
Dimensioning – Arrangements of dimensions – Rules for dimensions of circles ; radii ; angles ; plain holes	1	٦
Revision	١	٦
Total hours	**١5**	**90**

4 - Teaching and Learning and Assessment methods:

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

	b5	1			1	1										1		1				1
	b6	1			1	1										1		1				1
Applied Professional Skills	c1	1	1		1	1										1		1		1		1
	c2	1			1	1										1		1		1		1
	c3	1			1	1										1		1		1		1
	c4	1			1	1										1		1		1		1
	c5	1	1		1	1										1		1				1
	c6	1			1	1										1						1
General Tran. Skills	d1	1	1		1	1										1						
	d2	1	1		1	1										1				1		1
	d3	1			1	1										1						
	d4	1	1		1	1										1				1		1
	d5	1			1	1										1						

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes

Engineering Drawing by : Prof. Mamdouh Saber

6-2 Required books

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

6-3 Recommended books Non

6-4 Periodicals, Web sites etc . Non

7- Facilities required for teaching and learning:

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

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 102: Principle of Production Engineering

A- Affiliation

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

Department offering the course: Manufacturing Engineering and Production Technology Department

Date of specifications approval: September 2015

B - Basic Information

Title: Principle of Production Engineering
Credit Hours: 3
Code: MN 102
Lectures: 1
Practical: 4
Year/level: Fresh man Second Semester
Tutorial/Exercise:-
Total: 3
Pre-requisite: MNF 101

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- Basic production methods related to casting, metal forming processes, welding and metal cutting (A1)
a2- Design pattern, allowances in casting & solidification (A4).
a3- Fundamental of centrifugal casting process (A2)
a4- Classification o 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	Intellectual skills	B2,B3,B10,B18.
C	Professional and Practical Skills	C1, C3,C7.
D	General and transferable skills	D1,D3,D7,D9.

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course 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	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
	a6	1	1	1								1							1	1		1	1
Intellectual Skills	b1	1	1	1															1	1	1	1	1
	b2	1	1	1								1							1	1	1	1	1
	b3	1	1	1															1	1	1	1	1
	b4	1	1	1															1	1			1
Applied P. Skills	c1	1		1																	1	1	1
	c2	1	1																		1	1	1
	c3	1	1										1							1	1		1
General Tran. Skills	d1		1	1																			
	d2			1															1				
	d3																			1			
	d4												1									1	

5- Assessment Timing and Grading:

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

6- List of references:

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

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

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.:

7- Facilities required for teaching and learning:

- Lecture room , and workshops

Course coordinator: Prof. Ahmed Kohail
Dr Maher Khalifa

Head of the Department: Dr. Abdelmagid Abdelatif

Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MTH 101: Mathematics-1(Algebra and Calculus)

A- Affiliation

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

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

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

B - Basic Information

Title: Mathematics-1(Algebra and Calculus) **Code:** MTH 101 **Level:** Freshman, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 2 **Practical:** -
Pre-requisite: None

C - Professional Information

1 - Course Learning Objectives:

The main objective of this course is to investigate and learn 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 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 McLaurin 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	Intellectual skills	B1, B2, B3, B7
C	Professional and practical skills	C1, C12
D	General and transferable skills	D3, D7

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

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

6-2 Required books

John Bird,"Engineering Mathematics", Newnes, China, 2010

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: Non

6-4 Periodicals, Web sites, etc.

www.mathwords.com.

7- Facilities required for teaching and learning:

- Library
- Internet

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MTH102: 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 2015

B - Basic Information

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

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

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

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

b. Intellectual skills:

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

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

c - Professional and practical skills:

c1. Solve differential equations describing simple systems (C1, C7)

d - General and transferable skills:

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A5
B	Intellectual skills	B1, B2, B3, B4, B7, B11
C	Professional and Practical Skills	C1, C7
D	General and transferable skills	D1, D3, D7

3. Content

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

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

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

6-2 Required books

John Bird,"Engineering Mathematics", Newnes, China, 2010
W. Briggs, L. Cochran and B. Gillett,
E. W. Swokoski, Calculus, 6ed, PWS Publishing Company, Boston, 1994.
P. H. Selby, Analytic Geometry, 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. S. Shenawy
Head of the Department: Prof. Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
PHY101 : Physics I

A- Affiliation

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

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

Department offering the course: Basic Science Department.

Date of specifications approval: September 2015

B - Basic Information

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

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

Pre-requisite: None

C - Professional Information

1 – Course Learning Objectives:

By the end of this course any practicing engineer should be able to gain and apply the knowledge and understanding of the general properties of matter like rotational motion, gravitational law, elasticity, and understand the concept of fluid flow. The students should realize the mechanisms of heat transfer, kinetic theory of gases, ideal gases, translational kinetic energy and understand basics of Zeroth law of thermodynamics and first law of thermodynamic. They should be able to apply the first and second law of thermodynamics, learn about the properties, and types of waves and finally know the principle of superposition.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

After a successful completion of the course, the student will be able to know:

a1- the basic principles of rotational motion, application of rotational motion, the universal Gravitational law, Kepler's laws, Escape speed, and orbital energy. (A1,A3)

a2- basic properties of elastic materials and elastic moduli. (A3)

a3- outlines the Fundamental laws of fluid flow and fluid viscosity. (A3,A5)

a4- fundamental and basic principles including first law of thermodynamic, thermal expansion, heat, degrees of freedom and its relation with the specific heat. (A1,A3,A12)

a5- description of heat transfer, kinetic theory of gases. (A1,A5,A6,A8,A12)

a6- mathematical representation of waves, and the principle of superposition. (A2)

b - Intellectual skills:

Throughout the course, the student will 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,B7)

b2- predict the different laws that govern the motion of the body (Newton's laws, gravity law, and kepler's law). (B1,B2,B3,B7)

b3- analyze the characteristics of elastic materials and fluids. (B1,B2,B3,B7)

b4- differentiate and compare the different types of heat transfer in different walls. (B1,B2,B3,B7)

b5- differentiate and compare the different types of waves. (B1,B2,B3,B7)

c - Professional and practical skills:

Upon completion of the course, students will have the capability to:

c1 demonstrate knowledge and understanding of essential facts, concepts, principles and theories in solving of qualitative and quantitative problems of a familiar and unfamiliar nature.(C1,C2,C5,C11)
c2 analyze physical phenomena and solve problems depending on the gained background and concepts. (C1,C2,C5,C11)
c3 validate the concepts of some of the studied physical phenomena. (C1,C2,C5,C11)

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,D2,D3)
d2. use computing and information technology, and abstract and synthesize information. (D4,D9)
d3. develop reasoned and scientific arguments.(D5,D9)
d4. manage resources and time, and work within a deadline.(D6,D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A5, A6, A8, A12
B	Intellectual skills	B1, B2, B3, B7
C	Professional and Practical Skills	C1, C2, C5, C11
D	General and transferable skills	D1,D2, D3, D4, D6, D9

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Lab. Experiments					Researches and	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				1	1		1				
	a3	1			1	1	1									1	1		1				
	a5	1				1	1									1	1		1				
	a6	1		1		1	1					1				1	1		1				
	a8	1		1		1	1					1				1	1		1				
	a12	1		1		1										1							
Intellectual Skills	b1	1			1											1				1			
	b2	1			1	1										1			1	1			
	b3	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		1	1	1									1	1	1	1	1			
	c2	1			1											1		1	1	1			
	c5						1										1			1			
	c11						1										1			1			
General Tran. Skills	d1			1		1						1											
	d2		1	1								1											
	d3	1	1									1											
	d4	1	1	1								1											
	d6	1		1		1						1				1	1			1			

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Non

6-2 Required books

Physics for Scientists and Engineers, Raymond A. Serway, Thomson Brooks, 2004; 6th Edition.
Melbd Philips, "Classical electricity and Magnetism", Dover, USA, 2009

6-3 Recommended books:

Halliday, David, Robert Resnick, Jearl Walker. Fundamentals of Physics, 7th ed. Hoboken, N.J.: John Wiley and Sons. 2005.
John W. Jewt,"Physics for Scientists and Engineering with Modern Physics", Broske Cole, Canada, 2008

6-4 Periodicals, Web sites, etc.

http://www.physicsclassroom.com/calcpad/circgrav/
http://physicsworld.com/

7- Facilities required for teaching and learning:

1. Physics Lab. 1
2. Data Show

Course coordinator: Dr. Mohamed Eltawab
Head of the Department: Prof. Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
PHY 102:Physics 2

A- Affiliation

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

Department offering the program: 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 2015

B - Basic Information

Title: Physics **Code:** PHY 102 **Level:** Senior 2, Second Semester

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

Pre-requisite: PHY 101

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should be able to apply, demonstrate the knowledge and understanding of the concepts of 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, Gausses' 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) (A5) .

b - Intellectual skills:

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

b1- Investigate electric force and electric field (using Gauss's law) and select the proper manner to solve problem (B2, B3, B4, 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 compere 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 carey-foster bridge (C1, C5, C8, and C11).
c2- Determine time constant for (Rc) circuits (C1, C5, and C11).

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

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1- Write technical reports(D5)
d2- Use libraries information's in subjects (D1)
d3- Use the E-mail and internet (D3, D4, and D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, , A3, A4, A5, A13, A14, A15, A25
B	Intellectual skills	B2, B3, B4, B5, B6, B13, B15
C	Professional and Practical Skills	C1, C5, C8, C11, C14
D	General and transferable skills	D1, D3, D4,D5, D7

3 – Contents

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

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			

Intellect. Skills	b1	1			1	1									1		1	1	1			
	b2	1			1	1									1		1	1	1			
	b3	1		1	1							1							1			
Practical & Prof. Skills	c1	1			1		1					1					1		1	1		
	c2	1			1	1	1					1					1		1	1		
	c3	1			1		1					1					1		1	1		
	c4	1			1		1					1					1		1	1		
General Trans. 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	10
Mid-Term Exam	8-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes:

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

6-2 Required books

Melbd Philips, "Classical electricity and Magnetism", Dover, USA, 2009

John W. Jewt,"Physics for Scientists and Engineering with Modern Physics", Broske Cole, Canada, 2008

6-3 Recommended books:

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

Raymond A. Serway "Physics for Scientists and Engineers with Modern Physics" 3rd ed. Wiely, 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: Prof. Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 241: Presentation Skills

A- Affiliation

Relevant program: Electronic Engineering & Communication Technology BSc Program
Mechanical Design and Production Technology BSc Program
Department offering the program: Electronic Engineering & Communication Technology BSc Department
Mechanical Design and Production Technology BSc Department
Department offering the course: Electronic Engineering & Communication Technology BSc Department
Date of specifications approval: September 2015

B - Basic Information

Title: Presentation Skills **Code:** GEN241 **Level:** Third semester /Sophomore.
Credit Hours: 2 **Lectures:** 2 **Tutorial:**- **Practical: -**
Pre-requisite: None

C - Professional Information

1 – Course Learning Objectives:

This is a public speaking course that helps the student to combine both written knowledge with oral performance criteria. The course gives practical advice on the different modes of communication, including formal writing, CV writing, body language, art of listening, leadership, speeches, negotiation and face-to-face interactions, and examines how to design and deliver an effective presentation. Students will become more confident and less fearful, more skillful and less clumsy, more understanding of others and less threatened by them. Students will practice different modes of communication, and examines 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. (B13)

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	B13
C	Professional and practical skills	C11
D	General and transferable skills	D1, D2, D3, D5, D7

3- Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
1- Preparation of short talks.	2		
2- Fundamentals of preparing an attractive style for a short talk, techniques for using slides and projector for better interpretation. Using the power point technique for achieving and ideal short talk through a lab top and a data show / Seminar training.	8		
2- To improve the student communications skills / Seminar training	4		
3- To develop the student acquiring power of leadership	2		
4-. Training on active listening and negotiation.	4		
5- To understand and practice what's body language.	2		
6- How to write a technical report.	2		
7- C.V Writing	2		
8- Preparation of an attractive C.V. containing personal data qualifications, posts, and publications. - Interview Preparations.	4		
Total hours	**30**		

4 – Teaching, Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, assignments and reports	Weekly	40
Written Exam	Sixteenth week	60
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 OHP and data show facility.

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 242: Report Writing

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 2015

B - Basic Information

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

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

By the end of the course the student should gain the following knowledge:
a1- Different rhetorical models of writing.[A10]
a2- The art of communicating information.[A11]
a3- Implementation of information and communication technology in his future job.[A11]
a4- Methods of analyzing the engineering data.[A4]
a5- 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	10, 11, 4
B	Intellectual skills	4
C	Professional and Practical Skills	2, 4, 12, 13
D	General and transferable skills	6, 8

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method								
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving						Researches and Reports	Modeling and Simulation			Written Exam		Quizzes	Term papers	Assignments				
Knowledge & Understanding	a1	1	1	1	1							1				1		1	1					
	a2	1			1											1		1	1	1				
	a3	1			1											1		1	1	1				
	a4	1	1	1	1	1						1				1		1	1	1				
	a5	1														1		1	1	1				
Intellectual Skills	b1	1			1											1		1		1				
	b2	1			1	1										1		1	1	1				
	b3	1	1	1	1							1				1			1					
	b4	1	1		1							1				1		1	1	1				
Applied Prof	c1	1	1		1	1										1		1	1	1				
	c2	1			1											1		1	1	1				
	c3	1		1		1						1							1	1				
General Tran	d1			1		1						1							1					
	d2		1	1								1							1					
	d3	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	10 points
Written Exam	Sixteenth week	70 points
Total		100 points

6- List of references:

6-1 Course notes:

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

6-2 Required books

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

2- Daniel Riordan, "Technical Report Writing Today", Cengage Learning; 9 edition (December 7, 2004)

6-3 Recommended books:

1. Douglas Godfrey, “ASLE Author’s Guide”, Jan. ,1977

And in Arabic:

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

6-4 Periodicals, Web sites, etc.

www.technical-writing.com

7- Facilities required for teaching and learning:

Internet educational lab, Computer and Data show

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF211: 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 2015

B - Basic Information

Title: Mechanics of Materials **Code:** MNF211 **Year/level:** Sophomore/Semester3
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 3 **Practical:** --
Pre-requisite: MEC 101

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 • Mechanical Properties, Hook's Law • Thermal Stress	2	3
3	➢ Statically Indeterminate Force Systems. • Compatibility Equation	2	3
4	➢ Geometrical Characteristics of a Plane Figures. • First Moment of Area • The Centroid of an Area, Neutral Axis • Moment of Inertia of Some Geometrical Shapes	4	6
5	➢ Direct Shear Stress. • Application of direct shear stress	2	3
6	➢ Torsional Stress. • Twisting Moment, and Shear stress • Angle of Twist.	4	6
7	➢ Shearing Force and Bending Moment Diagrams. • Internal Shear Force and Bending Moment • Transverse Shear Stress	4	6
8	➢ Bending Stress. • Neutral Surface and Neutral Axis • Bending Stress in Beams	2	3
9	➢ Combined Stresses, principal Stresses. • Principal Stresses, and Principal Planes • Maximum Shearing Stress, and its Plane • Mohr's Circle	4	6
10	➢ Deflection of beams • Different approach to find the deflection of beams	2	3
11	➢ Selected Topics, (Spring, Thin walled Cylinder, ….)	2	3
Total hours		**30**	**45**

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		
	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		
	a8	1		1	1	1						1					1		1		1		
Intellectual Skills	b1	1			1												1		1		1		
	b2	1		1	1														1		1		
	b3	1			1												1		1		1		
	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 Trans. Skills	d1			1								1											
	d2			1	1							1											
	d3				1							1											

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Mechanics of Materials, elaborated by the instructor.

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: Dr. Abdelmagid Abdelatif

Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF212: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 2015

B - Basic Information

Title: Fundamentals of Materials Science **Code:** MNF212 **Level:** Sophomore, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: MNF100

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. 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.

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
➢ Strengthening mechanisms	4	4	2
➢ Mechanical properties of materials	6	6	3
➢ Electrical properties of materials	4	4	2
➢ Thermal properties of materials	4	4	2
➢ Optical properties of materials	2	2	1
➢ Magnetic properties of materials	2	2	1
Total hours	**30**	**30**	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1		1						1			1	1						
	a2	1	1	1	1							1				1				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)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: 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: Assist. Prof. Yasser Fouad
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specifications
MNF213: 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: September 2015

B - Basic Course Contribution in Program ILO s

Title: Mechanics of Machines-1 Code: MNF213 level: sophomore 1,first semester
Credit Hours: 3 Lectures: 2 Tutorial:3 Practical: 0
Pre-requisite: MEC 101, 102

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	Intellectual skills	B1 , B13
C	Professional and Practical Skills	C1
D	General and transferable skills	D3 , D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ System of particles			
• Linear and angular momentum of a system of particles	2	2	
• Motion of mass center of a system of particles	1	1	
• Angular momentum of a system of particles about its mass center	1	1	
• Conservation of momentum for a system of particles	1	1	
• Kinetic energy of a system of particles	1	1	
• Principles of work & energy for a system of particles	1	1	
• Principles of impulse & momentum for a system of particles	1	2	
➢ Moment of inertia	2	3	
➢ Kinematics of rigid bodies	4	6	
➢ Plane motion of rigid bodies: force & acceleration	6	9	
➢ Plane motion of rigid bodies: Energy & momentum	6	12	
➢ Cams	4	6	
Total hours	30	45	

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	1			1	1													1		1		1
	A13	1			1	1													1		1		1
Intellectual Skills	b1	1			1	1													1		1		1
	B13	1			1	1													1		1		1
Applied Professional Skills	c1	1			1	1													1		1		1
General Tran. Skills	d1	1			1	1													1		1		1
	D3	1			1	1													1		1		1
	D7	1			1	1													1		1		1
	D9	1			1	1													1		1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Quizzes & Reports	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: Mechanics of Machines

6-2 Required books

Ferdinand P Beer & E. Russell Johnston," Vector Machines For Engineers-Dynamics," McGraw-Hill, NY, 9th Ed., 2009

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

Lecturing and Exercise rooms

Course coordinator: Prof. Dr. Ahmed Sarhan
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 214: 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 2015

B - Basic Information

Title: Machine Drawing I **Code:** MNF 214 **Level**: Sophomore, First Semester
Credit Hours: 3 **Lectures:** 1 **Tutorial/Exercise:**6 **Practical:**
Pre-requisite: MNF 101

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-Develope 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, A6, A10, A13 & A18
B	Intellectual skills	B3 ,B4, B8 & B17
C	Professional and Practical Skills	C1, C2 ,C 3, C10 & 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	8
4. Surface Finish	4	8
5. Material Description	2	4
CHAPTER II: Graphical representation of principal machine elements and joints		
1. Introduction	2	
2. Standardization of Machine Parts		
3. Joints of Machine Parts		
4. Dismountable Joints		
4.1 Threaded Joints	4	8
4.2 Keyed Joints	4	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	**30**	**60**

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 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)
Assignments	weekly	20 points
Mid-Term Exam	Eighth week	20points
Written Exam	Sixteenth week	60 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: Prof. Nabil Gadallah
Head of the Department: Prof. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 215: 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
Department offering the course: Manufacturing Engineering and Production Technology Department
Date of specifications approval: September 2015

B - Basic Information

Title: Mechanics of Machines-2 **Code:** MNF215 **Year/level:** Sophomore, second semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 3 **Practical**: -
Prerequisite: MNF 213

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the students should know how to get the velocities of any mechanism members, joints, and parts. They should be able to analyze gear trains and calculate the gear ratios, torque and power transmitted to the loads. Understand gyroscopes, gyroscopic effects and processional motion. Application of the gyroscopic effects in machines, vehicles, aircrafts, and marines. Know the sources of inertia forces, couples, and unbalance of rotating shafts and rotors. Able to solve the problems of fluctuations of speeds and the unbalance of rotating parts. Able to regulate the speeds of rotating parts.

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, displacement, velocity, and acceleration time diagrams (A3) or (A13)
a2- Types of Motions of members of any mechanism (rotating, translating, plain motions) (A3).
a3- Theoretical background needed to calculate and analyze the motion of any mechanism and its individual members (A1).
a4- Classifications of gear trains and the fields of application of each (A3).
a5- Theoretical background needed to calculate the transmission ratio, the power and torque transmitted in each type of gear trains (A1).
a6- Concepts of gyroscopes, the gyroscopic effect and their theoretical backgrounds (A1).
a7- Concepts of inertia, inertia forces and couples, fluctuations of energy and speed. The inertia effects on operations of moving parts (A1).

b - Intellectual skills:

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

b1- Analyze the motion of mechanisms and their members (B5, B14, B17)
b2- Apply the principles of mathematics, science and technology to solve problems of mechanics of mechanical systems (B13).
b3- Evaluate designs, processes and propose improvements (B15).
b4- Select appropriate mathematical and computer-based methods for analyzing mechanics problems (B1).

c - Professional and practical skills:

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

c1- Design, assemble, operate, test and maintain mechanisms of motions (C3).
c2- Apply knowledge of mathematics, science and engineering practice integrally to solve mechanics problems (C1).
c3- Use computer software to design, calculate, simulate or animate different mechanisms of motion (C5, C6).
c4- Solve operational problems related to mechanisms and their members motions and the systems and their basic elements(C1, C8,C11).

d - General and transferable skills:

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

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

d2- 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, A4
B	Intellectual skills	B1, B5, B13, B14, B15
C	Professional and Practical Skills	C1, C3, C5, C6, C8, C11
D	General and transferable skills	D1, D3, D7

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 centroids, 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	
Gyroscopes: Definition of gyroscope, processional angular motion, gyroscopic couple, effect of gyroscopic couple in different applications (motor vehicles, marines, aircrafts, production machines, …….).	6	8	
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	3	
Total hours	**30**	**45**	**-**

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	1	1	1	1	1							1					1	1	1	1		1
	a2	1	1	1																	1		1
	a3	1			1	1							1						1	1	1		1
	a4	1	1	1									1					1			1		1
	a5	1			1	1							1						1	1	1		1
	a6	1	1	1	1	1							1						1		1		1

	a7	1	1	1	1	1							1					1	1	1	1		1
Intellectual Skills	b1	1	1		1	1												1	1		1		1
	b2	1	1		1	1												1	1		1		1
	b3	1			1	1													1		1		1
	b4	1																	1		1		1
Applied Prof. Skills	c1	1	1		1	1													1	1	1		1
	c2	1		1	1	1							1					1	1		1		1
	c3	1			1	1							1						1	1	1		1
	c4	1	1		1	1							1					1	1		1		1
General Tran. Skills	d1		1	1									1					1					
	d2	1	1	1	1	1							1					1			1		1
	d3		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	6-th Week	10
Written Exam	Sixteenth week	70
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 81-219-2524-x.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, Non

7- Facilities required for teaching and learning:

- Computer, Data show and Computer programs.

Course coordinator: Assist. Prof. Gaafar Ahmed Hussein
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF216: 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 2015

B - Basic Information

Title: Machine Drawing (2) **Code:** MNF216 **Year/level:** Sophomore/Semester 4
Credit Hours: **Lectures:** 1 **Tutorial:**6
Practical: -- **Total:** 3

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.(C1,C2&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	**PART I: BEARINGS** 1. Classification of bearings 2. Advantages of plain bearings 3. Advantages of rolling-contact bearings 4. Types of bearing loadings	1	6
2	**CHAPTER I: Sliding Bearings** A- Radial Sliding Bearing (Journal bearings) B- Thrust Sliding Bearing C- Combined Loaded Sliding Bearing	2	12
3	**CHAPTER II: Rolling Bearings** A- Radial Rolling Bearing (Ball bearings) B- Thrust Rolling Bearing C- Combined Loaded Rolling Bearing D- Mounting of Rolling Bearings	2	12
4	**PART II: POWER TRANSMISSION** 1. General: Direct (in contact) drives Indirect drives 2. General kinematics 3. General Kinetics 4. Efficiency of power Transmission	1	6
5	**CHAPTER IV: Gear Drive**		
	1. Spur gears	2	6
	2. Helical gears.	1	6
	3. Bevel gears	1	6
	4. Worm gears	1	6
	5. Gear Train	1	6
6	**CHAPTER V: BELT DRIVES** 1. Classification 2. General kinematics 3. General Kinetics 4. Efficiency of power Transmission	1	12
7	**CHAPTER VI: CHAIN DRIVES**	1	6
8	**PART III: SPRINGS** Kind of Springs Applications	1	6
Total hours		**15**	**90**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions	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				
Applied Prof. Skills	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: Quizzes& Reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	20
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes: Machine and Construction Drawing, elaborated by the instructor.

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 221: Metal Cutting Processes

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 2015

B - Basic information

Title: Metal Cutting Processes **Code:** MNF 221 **level:** Sophomore, First Semester
credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre- requisite: MNF 102

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 student should demonstrate knowledge and understanding of:

a 1 Characteristics of solid materials related to the metal cutting processes (A3).
a 2 Current classical production technologies as related to the production processes (A8).
a 3 Experimental determination of cutting parameters (energy, force, stress and strains) (A13).
a 4 Writing Technical report required when solving production problems (A10)
a 5 Comparison of theoretical and practical metal cutting conditions (A12).

b- Intellectual Skills

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

b 1 Think in a creative and innovative way in determining the suitable cutting process (B3).
b 2 Apply knowledge from different sources to cutting process (B9).
b 3 Investigate the relation between theoretical and practical results of cutting process (B12).
b 4 Evaluate and appraise the cutting processes for a certain product (B15).

c - Professional and Practical Skills

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

c1 Use different types of tools, techniques and equipment, pertaining to the production process. (C6).
c2 Design an experimental system for measuring the metal cutting process parameters and compare with the theoretical ones (C8)
c3 Exchange knowledge and skills with engineering community and industry when running production process (C11).
c4 Use of workshop facilities to carry out a cutting process (C15).
c5 Prepare the process plan for manufacturing as needed when running the production process(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 (D1).
d2- Communicate effectively and present data and results orally (D3).
d3- Search for information's in references and in internet (D7).
d4- Practice self-learning by producing some parts on machines(tuning, milling, shaping)(D7,D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3,A8, A13,A10, A12
B	Intellectual skills	B3, B9, B12,B15.
C	Professional and practical skills	C6, C8, C11, C15, C19.
D	General and transferable skills	D1, D3, D7, D9.

3- Content

Topic	Lecture hours	Tutorial hours	Practical Hours
1. Introduction, tool material, tool geometry	2	2	2
2. Metal cutting processes (turning)	2	4	2
3. Metal cutting processes (milling, shaping).	4		2
4. Metal cutting processes (drilling and grinding)	2	2	2
5. Mechanics of two and three dimensional cutting – Principles and mechanisms of wear.	4		4
6. Selection of cutting conditions, and cutting fluids.	4		2
7. Principles of jigs and fixtures.	1		2
8. Experimental determination of cutting energies forces, stresses and strains	4	1	4
9. The interrelationship between theoretical and practical metal cutting conditions.	3		4
10. Elaboration of sequence of manufacturing processes for the production of a component given by its working drawing.	4	6	6
Total	**30**	**15**	**30**

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	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
Intellectual Skills	b1	1	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
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		1		1	
General Tran. Skills	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	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Lecture notes, On Metal cutting Processes, by M. Merdan, Ph. D., 2013

6-2 Essential books (text books), None

6-3 Recommended books;

Tikanald, " metal cutting and machine tool engineering", K. p 2010.

S.D. El Wakil, " Processes and design for Manufacturing", 2nd Edition, PWS Publishing Company, 1998.

6-4 Periodicals, Web sites, etc. None

7- Facilities required for teaching and learning:

Lecture Room, Metrology Lab, and Workshops

Course coordinator: Dr. M. Merdan.
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 222: 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 2015

B - Basic Information

Title: Materials Technology and Testing **Code:**MNF 222 **Level:** Sophomore, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: MNF211, MNF212

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/Fe_3C 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/Fe3c iron carbon diagram	5	4	3
➢ phase Transformation	3	3	1
➢ Time Temperature Transformation (TTT) diagrams	5	5	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	**30**	**30**	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1		1						1			1	1						
	a2	1	1	1	1							1				1				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)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Materials Technology and Testing (Lecture Notes)
6-2 Required books : David G. Rethwisch, "Fundamentals of Materials sconce 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: Assist. Prof. Adel Elgammal
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MTH 203: Mathematics -3(Differential Equations and Transforms)

A- Affiliation

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

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

Department offering the course: Basic Science Department

Date of specifications approval: September 2015

B - Basic Information

Title: Differential Equations and Transform **Code:**MTH203 **Level:** Sophomore, Third Semester

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

Pre-requisite: MTH102

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

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

b - Intellectual skills:

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

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Apply O.D.E in electrical and mechanical problems. (C1, 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 with their colleagues. (D3)
d2- Search for information using internet. (D7)

Course Contribution in the Program ILO's

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

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods									Learning Methods				Assessment Method							
		Lecture	Discussions and seminars	Tutorials	Problem solving						Researches and	Modeling and			Written Exam	Quizzes	Assignments					
Knowledge & Understanding	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 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					
Applied Professional Skills	c1	1	1								1				1							
	c2	1	1								1				1							
	c3	1	1		1						1				1							
General Tran. Skills	d1		1	1							1						1					
	d2	1			1						1						1					

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

Differential Equations and Transforms by Prof. Dr. Aly .M.Essawi and Dr. Ashraf Taha El-Sayed Taha

6-2 Required books

Avern Friend Man,"advanced Calculus", Dover, USA, 2009

E. Kreyszig "Advanced Engineering Mathematics" 4th ed., John Wiley, New York,1980.

C.Ray Wylie.Louis.Barrett "Advanced Engineering Mathematics "5th ed.,Mc Graw Hill,1996.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

www.mathwords.com.

7- Facilities required for teaching and learning:

- Library
- Internet

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MTH 207: Mathematics-7 (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 Sciences Department
Date of specifications approval: September 2015

B - Basic Information

Title: Mathematics-7 (Numerical Analysis) **Code:** MTH 207 **Level:** Sophomore, Fourth Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**2 **Practical:**
Pre-requisite: MTH 203

C - Professional Information

1 – Course Learning Objectives:

The main objective of this course is to introduce some numerical methods for solving many mathematical problems.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

By the end of the course the student should be gain the following knowledge:
a1- Methods of Least square curve fitting (A1,A5)
a2- Methods of numerical interpolation using Newton and Lagrange methods (A1,A5)
a3- Methods of numerical Integration (A1)
a4- Methods of numerical solution of initial value problems (A1)
a5- Methods of numerical solution of linear and non-linear equation (A1)

b - Intellectual skills:

By the end of the course the student should be able to:
b1- Make a logical Analysis to reach to the proper solution (B1,B2,B3)
b2- Choose the right decision by choosing the right method (B2,B3,B11)
b3- Recognize the right method which has minimum error and using minimum numerical steps(B2,B3)

c - Professional and practical skills:

c1- Solve mathematical models describing simple engineering systems (c1, c5, c7)

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
B	Intellectual skills	B1, B2, B3, B11
C	Professional and Practical Skills	C1, C5, C7
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.	4	4	
Total hours	**30**	**30**	

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods				Assessment Method			
		Lecture	Discussions and seminars	Tutorials	Problem solving			Researches and Reports	Modeling and Simulation			Written Exam	Quizzes	Assignments	
Knowledge & Understanding	a1	1	1	1	1			1				1	1	1	
	a2	1	1	1	1			1				1	1	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. Skills	c1	1		1	1				1			1	1	1	
General Tran. Skills	d1			1	1			1						1	
	d2		1	1	1			1						1	
	d3													1	
	d4		1											1	

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

Numerical Methods for Engineers By Dr. Osama El-Gayar

6-2 Required books

Stevsn C, Chapra,"Numerical Methods for Engineering" , Mc-Graw Hill, Singapore, 2011

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

Amir Wadi Al-khafaji ,John R.Tooley "Numerical methods in Engineering Practice", New York,1990.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

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

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Assist. Prof. Osama El-Gayar
Head of the Department: Prof. Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELC 316: 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 2015

B - Basic Information

Title: Electro - Engineering **Code:** ELC 316 **Year/level:** Senior 1,first Semester

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

Pre-requisite: PHY 102

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)
b3- Analyze electric and electronic circuits with capabilities to apply to useful instruments, motors and radiators (B5, 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.	2	1	1
➢ Introducing electromagnetic standard.	2	2	1
➢ Currents and fields; properties and effects.	2	2	1
➢ Transmission lines and propagation.	2	2	1
➢ Electric and electronic circuits:	2	2	2
• Classification and basic mathematical relations	2	1	
• Op Amps and transistors.	2	2	1
• Fields and electromechanical actions.	2	2	1
➢ Electric Forces and radiated fields:	2	2	1
• Classification and basic designs.	2	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	**34**	**30**	**15**

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	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
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 Tran. Skills	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	10
Attendance & Mid-Term Exam	8-th Week	10
Lab & 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
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 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
ELC 317: Electrical Machines

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 2015

B - Basic Information

Title: Electrical Machines **Code:** ELC 317 **Level:** Junior, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:** 1 **Practical:** 2
Pre-requisite: ELC 316

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).
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 ().
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 (A15, A16).

b - Intellectual skills:

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

b1- Find the equivalent circuits of transformer and machines (B11).
b2- Allocate any fault and know its reason (B6, B9).
b3- Calculate the suitable machine parameters necessary for specific load (B2).
b4- Choose the suitable operating torque-speed point for best machine performance (B3).
b5- Calculate transformer and machines efficiency (B2).
b6- 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, and 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 affectivity through assignment (D3).
d2- Work in stressful environment and within constraints (D2).
d3- Effectively manage tasks, time, and resources (D6).
d4- Search for information and engage in life-long self-learning discipline (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5, A14, A15, A16
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.	3	2	4
➢ DC machine construction and operation.	2	2	3
➢ DC machine classification and applications	4	2	4
➢ 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
➢ Toque-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	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

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

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

6- List of references:

6-1 Course notes:

- S. A. Gawish, Electrical Machines & Power, Cairo, 2008.
- S. A. Gawish, Electrical Machines & Power, Practical Part, Cairo, 2008.

6-2 Required books

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

6-3 Recommended books: None.

6-4 Periodicals, Web sites, etc.

- Educational CD.

7- Facilities required for teaching and learning:

- Electrical Machines Lab.
- Data Show.

Course coordinator: Dr. Said A. Gawish.
Head of the Department: Dr. Said A. Gawish.
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 351: Engineering Economy

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 2015

B - Basic information

Title: Engineering Economy **Code:** GEN 351 **Year/level:** Senior 1-2nd.Semester
Credit Hours:2 **Lectures:** 2 **Tutorial:** - **Practical:** -
Pre-requisite: --

C - Professional information

1 – Course Learning Objectives

A study of this course will enable the student to:

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

2 - 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
General and transferable skills	D1, D2, D3, D7, D9

3 – Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
Cash Flow i- Cash flow table ii- Cash flow diagram Equivalence and time Value of Money	2 2		
Compound Interest i- Single payment interest ii- Uniform annual payment series iii- Arithmetic gradient payment series iv- Geometric gradient payment series	6		
Nominal and Effective Interest	2		
Engineering Problem Analysis: i- Present worth method ii- Equivalent uniform annual method iii- Rate of return method	8		
Depreciation i- Straight line technique ii- Sum of years-digits technique iii- Declining balance technique iv- Sinking fund technique	6		
Income Taxes	4		
Total hours	**30**		

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	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)
Semester Work: Quizzes & Reports	Weekly	2٠
Mid-Term Exam	6th. Week	10
Practical Exam	-	-
Written Exam	16th. week	70
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 Abdelatif
Dr. Metwally Hussein Metwally
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification

GEN 352: التشريعات والقوانين الهندسية

A- Affiliation

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

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

Department offering the course: Basic science department

Date of specifications approval: September 2015

B - Basic Information

Title: التشريعات والقوانين الهندسية **Code: GEN 352** **Level:** Sixth Semester (Junior)

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

Pre-requisite: non

C - Professional Information

1 – Course Learning Objectives:

مع نهاية هذا المقرر يكون الطالب قد تمكن من فهم وتحليل وتطبيق مصـــطلحات ومفاهيم قانونية و التشـــريعات الصـــناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمرانى و قوانين وتشريعات بيئية لحماية البيئة المصرية و المناقصات والعطاءات - قانون تنظيم المناقصات والعطاءات و العقود الهندسية الدولية و العقود الهندسية المحلية و المطالبات والتحكيم.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- منهجيات حل المشاكل الهندسية ، وجمع البيانات وتفسيرها (A5)

a2- نظم ضمان الجودة ، ومدونات الممارسات والمعايير ومتطلبات الأمن الصناعي والقضايا البيئية (A6)

a3- أخلاقيات المهنة والآثار المترتبة على الحلول الهندسية على المجتمع والبيئة (A9, A10, A11)

a4- اللغة التقنية وكتابة التقارير الهندسية (A10)

b - Intellectual skills:

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

b1- ان يفكر بطريقة خلاقة ومبتكرة في حل المشكلات (B3, B9, B12)

b2- ان يدمج ويستبدل ويقيم مختلف الأفكار والآراء من وجه النظر القانونية (B4, B9)

b3- تخطيط وإجراء وكتابة تقرير عن مشروع أو تكليف (B12)

C: **Professional and practical skills:**

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

c1- أن يعرض ويحل أحد المشاكل القانونية فى احد الشركات (C1, C5, C9)

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	A5, A6,A9, A10,A11
B	Intellectual skills	B3,B4, B9, B12
C	Professional and practical skills	C1, C5
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
مصطلحات ومفاهيم قانونية	4		
التشريعات الصناعية المصرية - قوانين وتشريعات اعمال البناء والتخطيط العمرانى	8		
قوانين وتشريعات بيئية لحماية البيئة المصرية	6		
المناقصات والعطاءات. - قانون تنظيم المناقصات والعطاءات	6		
العقود الهندسية المحلية - العقود الهندسية الدولية - المطالبات والتحكيم	6		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1								1				1		1					
	a2	1				1										1		1		1			
	a3	1		1								1				1				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							
Applied Prof. skills	C1	1		1																			
General Tran. Skills	d1	1		1		1						1											
	d2	1	1	1																			
	d3	1	1																	1			

5- Assessment Timing and Grading:

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

6- List of references:

6.1 Course notes

Lecture notes and handouts.

6.2 Required books

قوانين وتشريعات هندسية

عبد الجواد توفيق احمد، عثمان احمد ,دليل المهندس :مجموعة القوانين واللوائح والتشريعات الخاصة بمزاولة مهنة الهندسة وتنظيم المباني وتخطيط المدن والقرى، مكتبة الانجلو، القاهرة، ١٩٨١

6.3 Recommended books None
6.4 Periodical, Web sites, etc.: None

7- Facilities required for teaching and learning:

- Library
- Internet

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 353: إدارة اعمال دولية

A- Affiliation

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

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

Department offering the course: Basic Science Department

Date of specifications approval: September 2015

B - Basic Information

Title:إدارة أعمال دولية **Code:** GEN 353 **Level:** Tenth Semester (Senior-2)

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

Pre-requisite: non

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

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

a1- الإدارة والتخطيط و صياغة واتخاذ القرارات الإدارية (A7, A10, A20)

a2- التنظيم الإدارای وبناء الهياكل التنظيميه (A7)

a3- التوجيه والقياده والرقابه وإدارة الاعمال الدولية وإدارة الجوده الشامله (A6, A7, A12)

b - Intellectual skills:

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

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

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

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

c - Professional and practical skills:

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

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

d - General and transferable skills:

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

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

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A6, A7, A10, A12, A20
B	Intellectual Skills	B3, B4, B5, B9, B10
C	Professional and practical skills	C1, C5
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
مفهوم الإدارة والتخطيط .	4		
صياغة واتخاذ القرارات الإداريه .	4		
التنظيم الإدارى وبناء الهياكل التنظيمية.	6		
التوجيه والقياده والرقابه .	8		
مدخل إلى إدارة الأعمال الدولية وإدارة الجوده الشامله .	8		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method								
		Lecture	Presentations	Discussions	Tutorials	Problem solving	Laboratory &					Researches	Modeling and			Written Exam	Practical Exam	Quizzes	Term papers	Assignments				
Knowledge &	a1	1		1		1						1				1		1	1	1				
	a2	1	1	1												1		1	1	1				
	a3	1		1		1						1				1		1	1					
Intellectual Skills	b1	1														1		1	1	1				
	b2	1				1										1		1	1	1				
	b3	1	1	1								1				1			1	1				
Professional skills	c1	1	1	1								1				1		1	1	1				
General Tran	d1	1		1		1													1	1				
	d2			1		1													1	1				
	d3			1															1	1				

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Non

6-2 Required books

- Robbins & coulter "Management" , 12th edition, 2013.
- Michael R. Czinkota "International Business", European edition, 2009.

6-3 Recommended books: Non

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

7- Facilities required for teaching and learning:

- Computer, Data show and Projector.

Course coordinator: Dr. Marwa Shoeib
Head of the Department: Dr. Lila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 354: Sound Systems and Noise Pollution

A- Affiliation

Relevant program: Architecture Engineering and Building Technology BSc Program
Manufacturing Engineering and Production Technology BSc. Program
Electronic Engineering & Communications Technology BSc Program
Computer Engineering & Information Technology BSc Program

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

Department offering the course: Architecture Engineering and Building Technology Department

Date of specifications approval: September 2015

B - Basic Information

Title: Sound Systems and Noise Pollution **Code:** GEN 354 **level:** Senior 1

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

Pre-requisite : None

C - Professional Information

1 – Course Learning Objectives:

The objective of the course is learning:

- Fundamentals of Sound. -Intensity of Sound, Sound Levels and the Decibels.
- Speech, Music, Hearing of Sound.
- Quality of Sound, Noise and Doppler Effect and Transmission of Sound.
- Interference, Diffraction, Absorption, Refraction and Diffusion of Sound.
- Sources of Acoustic Noise, Noise Reduction and Canceling, Sound Filters and Test Rooms.
- Application Ultrasound and Ultrasound Imaging.

2 - Intended Learning Outcomes (ILOS)

By the end of the course the student should acquire the flowing knowledge and understanding:

a1 - Fundamentals of Sound. -Intensity of Sound, Sound Levels and the Decibels. (A1)
a2 –Speech, Music, Hearing of Sound. (A8)
a3 -Quality of Sound, Noise and Doppler Effect and Transmission of Sound. (A11)

B - Intellectual skills:

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

b1 -Integrating different scales of interference, diffraction, absorption, refraction and diffusion of sound (B4,B13)
b2–Determine sources of acoustic noise, noise reduction and canceling, sound filters and test rooms. (B15)

C - Professional and practical skills:

By the end of the course the student should practice:

c1 - Application Ultrasound and Ultrasound Imaging. (C3,C16)

D - General and transferable skills:

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

d1 - Communicating ideas verbally and visually in a clear coherent manner. (D3)
d2 - Ability to work in team environments. (D1)
d3 -Acquire entrepreneurial skills (D8).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A8,A11
B	Intellectual skills	B4,B13,B15
C	Professional and Practical Skills	C3, C16
D	General and transferable skills	D1,D3, D8

3 – Contents

	Topic	Lecture hours	Tutorial hours	Practical hours
1	Fundamentals of Sound	2	-	-
2	Intensity of Sound	2	-	-
3	Sound Levels and the Decibels	2	-	-
4	Speech, Music, Hearing of Sound	2	-	-
5	Speech, Music, Hearing of Sound	2	-	-
6	Quality of Sound	2	-	-
7	Mid-Term Exam	2	-	-
8	Noise and Doppler Effect	2	-	-
9	Transmission of Sound.	2	-	-
10	Interference, Diffraction, Absorption, Refraction and Diffusion of Sound.	2	-	-
11	Sources of Acoustic Noise, Noise Reduction and Canceling	2	-	-
12	Sound Filters and Test Rooms	2	-	-
13	Application Ultrasound and Ultrasound Imaging.	2	-	-
14	Application Ultrasound and Ultrasound Imaging.	2	-	-
15	Revision	2	-	-
	Total hours	**30**	**-**	**-**

4 - Teaching and Learning and Assessment methods

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lectures	Presentations	Discussions	Tutorials/Sketche	Practical and	Problem solving	Brain storming	Projects	3-D Modeling	Playing	Researches and	Modeling and	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understan	a1	1						1				1			1				1	1			
	a2	1						1				1			1				1	1			
	a3	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 Prof. Skills	c1						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 (%)	Grade (Degrees)
Semester Work: assignments	Bi-Weekly	20%	20
Mid-Term Exam	7-th Week	10 %	10

Final Exam	Sixteenth week	70 %	70
Total		100%	100

6- List of references:

6-1 Course notes

Lecture notes.

6-2 Required books

- Everest, F. Ation, "The Master Handbook of Acoustics", Fourth Edition, McGraw Hill, 2001.

6-3 Recommended books

- Douglas, C.Giancoli "Physics for Scientists and Engineers", Third edition, Published, Prentice Hall, ISBN 0-13-243106-8.,2001.

6-4 Periodicals, Web sites, etc.

- Frederick E.Trinklin,"Modern Physics", Published by Holt, Rinehant and Wiston, ISBN 0-03-074317-6, 2000.

7- Facilities required for teaching and learning:

White boards and markers.

Course coordinator: Dr. Sayed Abd Elkhalek
Head of the Department: Assist. Prof. Nahed Omran
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF311: 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 2015

B - BASIC INFORMATION

Title: Fluid Mechanics **Code:** MNF311 **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:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Assignments	Quizzes	Reports	Mid-Term	Practical Exam	Written 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	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: 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: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 312: 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 2015

B - Basic Information

Title: : Computer Applications I **Code:** MNF312 **Year/level:** Junior- 1st semester
Credit Hours: **Lectures:** 2 **Tutorial:**- **Practical:** 2
Pre-requisite: MNF 211

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	4		4
• Introduction and basic vector and matrix	4		4
• Polynomials and solution of linear systems	2		2
• Programming and applications	4		4
Total hours	**30**		**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations &	Discussions &	Tutorials	Problem solving	Site visits	Projects				Modeling &	Self-learning	Cooperative	Researches &	Seminars	Quizzes	Reports	Mid-Term	Practical Exam	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	10
Mid-Term Exam	6th. Week	10
Practical Exam	15th. week	20
Written Exam	16th. week	60
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

6-3 **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: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 313: 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: September 2015

B - Basic Information

Title: Computer Application -2 **Code:** MNF 313 **Level:** Level 2, Second Semester
Credit Hours: 2 **Lectures:** -- **Tutorial/Exercise:** 6 **Practical:** --
Pre-requisite: MNF 312

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 (Funoc)
- 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 (funoc).(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			3
Basic Definitions of G-Codes			3
Different Types of G-Codes			6
Basic Terminology of G-Code (FUNOC)			6
Milling:			
– Work piece Installation			6
– Determination of Zero Position			6
– Definition and Applications of G58 , G52			6
– Definition and Applications of G00			6
– Definition and Applications of G01			6
– Definition and Applications of G02 , G03			12
Turning:			
– Definition and Applications of G58 , G52			6
– Definition and Applications of G00			6
– Definition and Applications of G01			6
– Definition and Applications of G02 , G03			6
Revisions			6
Total hours			**90**

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 Profession al Skills	c1		1	1			1					1				1	1	1	1	1			
	c2		1	1			1					1				1	1	1	1	1			
	c3		1	1			1					1				1	1	1	1	1			
General Tran. Skills	d1		1	1								1							1				
	d2		1	1								1							1				

- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

Lecture notes

6-2 Essential books (text books)

Software manuals.

6-3 Recommended books

James V. Valentino, Ed V. Goldenberg and AAA Predator, Introduction to Computer Numerical Control, 5th Edition, Prentice Hall, 2012

6-4 Periodicals, Web sites, etc.

None

7- Facilities Required for Teaching and Learning

- Computer lab. equipped with suitable computers and packages
- A3 printer and A1 plotter
- Data show

Course Coordinator: Dr. Atif Afify
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF314: 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 2015

B - Basic Information

Title: Thermodynamics
Code: MNF314
Year/level: Junior, 2nd 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.	4	2	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.	12	4	2
• 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).	12	4	2
• 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	12	4	2
• Second law of thermodynamics: Heat engine and heat pump, Kelvin–Plank and Clausius statements. Reversibility and factors affecting it, Carnot cycle and its efficiency, Thermodynamic temperature scales.	10	2	2
• 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,	10	2	2
Total hours	**60**	**18**	**12**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations &	Discussions &	Tutorials	Problem solving	Laboratory	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			x			1	1	x					1				
	b3	1			1	1		x	x			1	1	x					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	10
Mid-Term Exam	6-th Week	10
Practical Exam	Twelfth week	20
Written Exam	Sixteenth week	60
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: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

COURSE SPECIFICATIONS
MNF 321: Metal Cutting Theory

A- Affiliation

Relevant Program: Manufacturing Engineering & Production Technology BSc Program
Depart. Offering the Program: Department of Manufacturing Eng. & Production Technology Program
Depart offering the Course: Department of Manufacturing Eng. & Production Technology Program
Date specification approval: September 2015

B-Basic Information

Title: Metal Cutting Theory **Code:** MNF321 **level:** Junior, Frist Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 Practical: 2
Pre- requisite: MNF 221

C - Professional Information

1 – Course Learning Objectives:

The main objectives of this course are to introduce the principles of theories of metal cutting, accompanying phenomena, processes selection, as well as the basics of some related topics including, machining deviations: reasons, types, and standardizations, linear measurement methods and devices, dimensional analysis and solution of dimension chains.

2- INTENDED LEARNING OUTCOMES

a - Knowledge and Understanding

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

- a1 Concepts and theories of mathematics related to metal cutting (A1)
- a2 Characteristics of materials related to metal cutting processes (A3)
- a3 Methodologies of solving metal cutting problems (A5).
- a4 Different theories for determination of forces, stresses, and strains acting on both cutting tools and work pieces during the cutting processes. (A8).
- a5 Technical language and report writing in solving problems relevant to metal cutting (A10)
- a6 Solution of the problem of thermal stresses and strains during cutting process (A12).
- a7 Choice of tool material, determination of wear, and estimation of service life of tools (A14).

b - Intellectual Skills

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

- b1 Select appropriate mathematical methods for modeling and solving metal cutting problems (B1).
- b2 Think in a creative and innovative way in solving metal cutting problems (B3).
- b3 Determine the cutting conditions (B9).
- b4 Create systematic and methodic approaches when dealing with new and advancing technology related to currently used technology at metal cutting (B12).
- b5 Apply the principles of mathematics and technology in problem solving when analyzing metal cutting problems (B13).
- b6 Calculate stresses due to heat initialed by friction between tools and work pieces (B17).
- b7 Predict service life of tools used in cutting processes (B18).

c - Professional and Practical Skills

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

- c1 Apply knowledge of mathematics, to problems solving in metal cutting processes (C1).
- c2 Professionally merge the metal cutting knowledge, understanding, and feedback to improve design, products and/or services(C2).
- c3 Use measuring instruments, workshops facilities and laboratory equipment to design experiments for analysing the concepts of metal cutting, then collect, analyze and interpret results of experiments (C5).
- c4 Use a wide range of tools, techniques, and equipment, pertaining to the metal cutting theories and develop required computer programs (C6).
- C5 Apply safe systems when dealing with different techniques (C8).

C6 Prepare and present technical reports required when solving problems and executing experiments (C12).
C7 Use laboratory equipment to measure the wear in tools used for cutting processes (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- Practice self-learning by producing some parts on machines(tuning, milling, shaping)(D7,D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A3,A5, A8, A10, A12,A14
B	Intellectual skills	B1,B3, B9, B12, B17,B18.
C	Professional and practical skills	C1,C2, C5, C6, C8, C12, C17.
D	General and transferable skills	D1, D3, D7, D9.

3- Contents

Topic	Lecture hours	Tutorial hours	Practical Hours
1. **Tool Nomenclature**: Single point tool- significance of the various angles provided and nose radius- American German CIRP and orthogonal system of tool nomenclature, conversion of rake angles from American to German and vice versa- Nomenclature of drills, milling cutters and broaches- Need for chip breakers	6	3	6
2. **Mechanics of Metal Cutting**: Mechanism of formation of chips-types of chips and the conditions conducive for the formation of each type build-up edge, its effects orthogonal Vs oblique cutting-Merchant's circle diagram-force and velocity relationship, shear plane angle, Energy considerations in matching- Ernst Merchant's theory of shear angle relationship-original assumption and modifications made.	6	3	6
3. **Forces in Machining**: Forces in turning, drilling, milling and grinding, conventional Vs climb milling-mean and maximum cross sectional areas of chip in milling-specific cutting pressure-specific horse power-requirements of tool dynamometers-construction and principle of operation of tool dynamometers for turning, drilling and milling .	6	3	6
4. **Thermal Aspects in machining**: Sources of heat generation in machining –temperature measurement techniques in machining, Functions of cutting fluid-characteristics of cutting fluid-types free machining steel-o.p additives-application of cutting fluids	6	3	6
5. **Tool Materials, Tool Wear and Tool Life**: Requirements of tool materials-advaces in tool materials-HSS, PM, coated HSS, carbides and coated carbides,ceramic, cold pressed, hot pressed, ceramic composites, CBN, Diamond properties, advtages and limitations-ISO-specifications for iserts and tool holders, tool wear, typemechanismes, tool life, mach inability, economics of machining,, chatter in machining.	6	3	6
Total	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	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
	a7	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
	b5	1																					1
	b6	1																					1
	b7	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
	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		1	
	c6	1																					
	c7	1																					
General Tran. Skills	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	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6-List of references:

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

6-2 Required books; Kuppuswamy. G. " Principles of Metal Cutting", Universities Press, 1996

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.; none

7-Facilities required for teaching and learning:

Lecture room, workshops, and laboratory

Course coordinator: **Dr.** M. Merdan

Head of the Department: Dr. Abdelmagid Abdelatif,

Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 322: 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: September 2015

B – Basic Information

Title: Machine Design (I) **Code:** MNF322 **Level:** Junior, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**3 **Practical: –**
Pre-requisite: MNF 216

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. (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	1	4
• Determination of principal stresses for a stress element	2	4
• Design for static strength	4	8
• Design for Dynamic strength	6	8
• Design of Shafts	2	4
• Design of Keys, Feathers & splines	2	3
• Design of Threaded Joints, Fasteners and Connections	6	6
• Design of Welded Joints	1	3
• Design of Helical Springs	4	4
Total hours	**30**	**45**

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	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.	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 assignments and reports	Bi-Weekly	10
Mid-Term Exam	7-th Week	20
Practical Exam	–	–
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Essential book

Serage E. Khalifa, Machine Design I, Modern Academy, Cairo, 2012.

6-2 Recommended books

1.Shigley J.E., Mechanical Engineering Design, first metric edition, McGraw- Hill,1986.
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.scribed.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. Serage El-din Khalifa
Head of the Department:	Dr. Abdelmagid Abdelatif
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 323: 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 2015

B – Basic Information

Title: Foundry Technology **Code:** MNF323 **Level:** Junior, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical: 2**
Pre-requisite: MNF 212

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- feting, 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	4	2	6
• 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	4	2	6
• 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	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods								Learning Methods				Assessment Method						
		Lecture	Presentations	Discussions & Seminars	Tutorials	Problem solving	Laboratory & experiments			Researches & Reports	Modeling & Simulation			Written Exam	Practical Exam.	Quizzes	Term Papers	Assigmnents		
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	10
Mid-Term Exam	7-th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course Notes

Foundary 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. " Foundary Engineering", Wiley Eastern Ltd., 1993.

6.3 Recommended books

None

6-4 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: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 324: 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 2015

B - Basic Information

Title: Machine Design (II) **Code:** MNF324 **Level:** Junior, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**3 **Practical:** –
Pre-requisite: MNF 322

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	2
• Hydrodynamic bearings design	2	6
• Rolling contact bearings	6	8
• Involute gear tooth	2	3
• Spur gears	4	8
• Helical gears	4	6
• Bevel gears	4	6
• Worm gears	4	6
Total hours	**30**	**45**

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	1
	b2	1			1															1		
	b3	1			1	1														1	1	1
	b4			1	1	1						1								1	1	1
Applied Profess. 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 assignments and reports	Bi-Weekly	10
Mid-Term Exam	7-th Week	20
Practical Exam	—	–
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Essential books

Serage E. Khalifa, Machine Design II, Modern Academy, Cairo, 2012.

6-2 Recommended books

1.Shigley J.E., Mechanical Engineering Design, first metric edition, McGraw- Hill,1986.

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.

4. http://www.onesmartclick/engineering/machine-design.html
5. http://www.scribed.com/doc/100573482/Design-of-Machine-Element.html
6. 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. Serage El-din Khalifa
Head of the Department:	Dr. Abdelmagid Abdelatif
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 325: 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 2015

B - Basic Information

Title: Engineering Metrology
Credit Hours: 3

Code: MNF 325
Lectures: 2
Practical: 2

Year/level: Junior 6th Semester
Tutorial:1
Total: 3
Pre-requisite: MNF 211

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.	4	2	4
Light waves as standard of length.	4	2	4
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	4
Computer software for engineering metrology	4	2	4
Revision	2	1	2
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Mini	Discussions & Seminars	Tutorials	Problem	Laboratory					Modeling	Self-learning	Experimental				Class	Quizzes	Reports	Mid-Term	Practical	Written Exam
Knowledge & Understandin	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
	c2	1			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
General Tran. Skills	d1	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	10
Mid-Term Exam	6th. Week	10
Practical Exam	15th. week	20
Written Exam	16th. week	60
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: Prof. Dr. Nabil Gadallah
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF361 : 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 2015

B - Basic Information

Title : Seminar-1 **Code:** MNF 361 **Year/level:** Junior ,5th semester
Credit Hours: 1 **Lectures:** **Tutorial:** 2 **Practical:**
Pre-requisite: None

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
• The course consists of a number of seminars concerned with the development of technology and its impact to society, It covers the following areas: ✓ 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.		30	
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	During the semester	30
Oral Exam	By the end of each seminar	70
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:	Dr. Abdelmagid A. Abdalla
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF362 : 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 2015

B - Basic Information

Title : Seminar-2 **Code:** MNF 362 **Year/level:** Junior ,6th semester
Credit Hours: 1 **Lectures:** - **Tutorial:** -2 **Practical:**
Pre-requisite: None

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
• The course consists of a number of seminars concerned with the development of technology and its impact to society, It covers the following areas: ✓ 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.		30	
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	During the semester	30
Oral Exam	By the end of each seminar	70
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:	Dr. Abdelmagid A. Abdalla
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MTH 305M: Mathematics-5 (Introduction to Probability and Statistics)

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 Sciences Department
Date of specifications approval: September 2015

B - Basic Information

Title: Mathematics-5(Introduction to Probability and Statistics) **Code:** MTH 305 **Level:** (Junior)

Credit Hours: 3 **Lectures: 2** **Tutorial/Exercise: 2** **Practical:** -
Pre-requisite: 102

C - Professional Information

1 - Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- Rules of axioms of probability. (A1, A2).
a2- Rules of addition probability, multiplication probability and conditional probability. (A1, A2)
a3- Rules of discrete and continuous distributions. (A1, A5)
a4- Basic concepts Statistics, measure of location (sample mean), median and mode, measures of variations. (A1, A5)

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Solve problems on addition probability, multiplication probability and conditional probability. (B1, B2)
b2- Use to solve applied Engineering Models.(B1, B2, B7)
b3- Apply random variables, binomial distribution, normal distribution, cumulative distribution and standard normal distribution to applications. (B1, B2)
b4- Apply basic concepts of statistics, measure of location (sample mean), median and mode, measures of variations to analyze results of numerical models and assess their limitations.. (B1, B2, B3, B11)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Apply axioms of probability and statistics, in mechanics and electronics.(C1, C12)
c2- Use discrete and continuous distributions to solve engineering problems. (C1, C2)
c3- Use statistics to prepare and present technical reports.(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	Intellectual skills	B1, B2, B3, B7,B11
C	Professional and practical skills	C1, C2, C12
D	General and transferable skills	D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction, Sample space, Axioms of probability	3	2	
Conditional probability Bay's theorem	3	4	
Random variables.	3	4	
Binomial distribution.	3	3	
Normal distribution.	3	2	
Cumulative distribution.	2	2	
Standard normal distribution.	6	6	
Introduction to Statistics, measure of location (sample mean)	3	3	
Median and mode.	2	2	
Measures of variations	2	2	
Total hours	**30**	**30**	

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods				Assessment Method			
		Lecture	Discussions and seminars	Tutorials	Problem solving			Researches and Reports	Modeling and Simulation			Written Exam	Quizzes	Assignments	
Knowledge & Understanding	a1	1	1	1	1			1				1	1	1	
	a2	1		1	1			1				1	1	1	
	a3	1		1	1			1				1	1	1	
	a4	1	1	1	1			1	1			1	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	
Applied Professional Skills	c1	1	1						1			1			
	c2	1	1						1			1			
	C3	1	1						1			1			
General Tran. Skills	d1		1		1			1						1	
	d2	1	1	1	1			1						1	
	d3	1						1						1	

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

Probability and Statistics By Dr. Osama El-Gayar

6-2 Required books

Janet Susan, "Introduction to Probability and Statistics", Mc- Graw Hill, USA, 2003.

C. Ray Wylie ,Louis C. Barrett "Advanced Engineering Mathematics"5th ed., Mc Graw Hill International ed.,1996.

Allan J. "Mathematics for Engineers and Scientists 3rd ed., Billing Ltd.(UK),1985.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

www.mathwords.com.

7- Facilities required for teaching and learning:

- Library
- Internet

Course coordinator: Assistant Prof. Osama El-Gayar
Head of the Department: Prof. Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

COURSE SPECIFICATION
MNF 424: ADVANCED COMPOSITE MATERIAL

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology
Department offering the program: Manufacturing Engineering & Production Technology Dept.
Department offering the course: Manufacturing Engineering & Production Technology Dept.
Date of specifications approval: September 2015

B - Basic Information

Title: Advanced Composite Material **Code:** MNF 424 **Year/level:** 4-th year / 2-nd Term
Credit Hours: 2 **Lectures: 2** **Tutorial: 1** **Practical: 2**
Pre-requisite: MNF 222

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, A24)
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, B19)
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, C21)
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, C22)

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.(C7)
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, A24
B	Intellectual skills	B2, B3, B7, B12, B17, B18, B19
C	Professional and practical skills	C3, C5, C8, C15, C17, C19 , C21, C22
D	General and transferable skills	D3, D4, D7, D8, D9

3 – Contents:

Topic	Lecture hours	Tutorial hours	Practical hours
• Engineering materials (Types and applications)	1	2	2
• Materials selections		3	
• Qualitative material selection	2		
• Quantitative material selection	2		2
• Concept of cost per unit property	2		
• Case study of metal substitutions	2		
• Materials for low temperature applications-Polymer (structure, properties, behavior, classifications)	2	3	2
• Materials for high temperature applications-Ceramic (structure, properties, behavior, classifications)	2		2
• Composite materials-high performance materials			
• Structure, properties, behavior, classifications	2	4	4
• Composite design guide and architectural	2		4
• Raw materials for part fabrications	2		4
• Product development & Product life cycle	2		
• Design for Assembly Manufacturing	2	3	2
• Failure Mode and Effect Analysis (FMEA)	2		
• Manufacturing techniques			2
• Reinforcement manufacturing-(CF, GF, others)	1		2
• Composite manufacturing	2		2
• Recycling of composites	1		2
• New trends in material technology	1		
Total hours	**45**	**15**	**30**

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	Written 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
Ap	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 Trans. 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	10
Mid-term exam	Week 8	10
Practical Exam	Week 15	20
Final exam	Week 16	60
	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, 2001
- William D. Callister, Jr., and David G. Rethwisch "Materials Science and Engineering, An Introduction" 9 th Edition 2014 , 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. Bakr Mohamed Rabeeh
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

COURSE SPECIFICATIONS
GEN 453 : Industrial Psychology

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology Department
Depart offering the program: Manufacturing Engineering and Production Technology Department
Depart offering the course Manufacturing Engineering and Production Technology Department
Date specification approval September 2015

B- BASIC INFORMATION

Title: Industrial Psychology **Code:** GEN453 **Year /level :**Semester 5
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:

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	8th. Week	10
Written Exam	16th. week	35
Total		50

6- List of references:
6-1 Course notes: Lecture notes and handouts prepared by the course coordinator .
6-2 Required books : Non
6-3 Recommended books: Non
6-4 Periodicals, Web sites, etc.: Non

7- Facilities required for teaching and learning:
- Non

Course coordinator: Prof. Mamdouh Saber
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
GEN 454: Basics of Engineering Syndicate Works

A- Affiliation

Relevant program: Computer Engineering and Information Technology BSc Program
Department offering the program: Computer Engineering and Information Technology Department
Department offering the course: Computer Engineering and Information Technology Department
Date of specifications approval: September 2015

B - Basic Information

Title: Basics of Engineering syndicate works **Code:** GEN 454 **level:** senior 1, First Semester
Credit Hours: 2 **Lectures:** 2 **Tutorial:** 2 **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 the positive role of Egyptian engineering syndicate. They should be able to apply the principles for organizing practice and performance of members of their duties, mobilize the forces of members and organize their efforts and develop and publish researches and studies in different engineering fields.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- The main rolls and laws for the Egyptian Engineering Syndicate (A7,A8).
a2- The principals of Engineer's Syndicate Cycle (A9, A10).
a3- Charter of honor for engineers (A11, A13).

b - Intellectual skills:

On successful completion of the course, the student should be able to:
b1- Aware of importance of engineering studies (B8,B9).
b2- Compare and choose of his specialty field (B11,B13).

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Know and aware how to find his/her training courses and jobs by engineering syndicate (C10,C11).
c2- acquire the maximum benefits from the syndicate (C12,C13).

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1- have social relationships between the families in the sport clubs (D1,D2).
d2- have extensive knowledge from the periodic courses that are held there (D3,D6,D7) .

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A7, A8, A9, A10, A11, A13
B	Intellectual skills	B8, B9, B11, B13
C	Professional and Practical Skills	C10, C11,C12,C13
D	General and transferable skills	D1, D2,D3, D6,D7

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Engineering education in Egypt	4	4	
➢ Establishment of engineering faculties in Egypt and ➢ Scientific fields of specialization of engineering faculties	4	4	
➢ Engineers Syndicate in Egypt and Charter of honor for ➢ engineers.	4	4	
➢ Phases of developing Engineer's Syndicate	4	4	
➢ Egyptian Association for Engineers	4	4	
➢ Services provided by engineer's syndicate for engineers and their families	4	4	
➢ Rules and regulations which control engineers at work.	6	6	
Total hours	**30**	**30**	

4 - Teaching and Learning , Assessment Methods and Grading:

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							
Intellectual Skills	b1	1														1							
	b2	1	1													1				1			
Applied Prof. Skills	c1	1				1	1									1							
	c2	1	1													1							
General Tran skills	d1	1		1		1																	
	d2	1	1	1																			

6- List of references:

6-1 Course notes: Non

6-2 Required books: None

6-3 Recommended books: None

6-4 Periodicals, Web sites, etc.

- http://www.eea.org.eg/
- http://au.alexu.edu.eg/English/Life@AU/Alumni/Pages/Alumni-Syndicate/Engineering-Syndicate.aspx

7- Facilities required for teaching and learning:

- Data show.
- White board.

Course coordinator: Dr. Said Gawish
Head of the Department: Dr. Said Gawish
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 411: 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 2015

B - Basic Information

Title: Mechanical Measurements
Credit Hours:
Code: MNF 411
Lectures: 2
Practical: 2
Year/level: Senior 1- 8th. semester
Tutorial:-
Total: 3
Pre-requisite: MNF 211

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 the 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, 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	2	4
Traceability, uncertainty & calibration	2	1	2
Strain measurements: Wire strain gauges	2	1	2
Strain measurements: Extensometers	2	1	2
Stress measurements: Photo-elasticity	2	1	2
Time and speed measurements	2	1	2
Acceleration and frequency measurements	2	1	2
Force and torque measurements	2	1	2
Power measurements	2	1	2
Pressure measurements	2	1	2
Solid and fluid level measurements	2	1	2
Viscosity measurements	2	1	2
Fluid flow measurements	2	1	2
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory					Modeling	Self-learning	Experimental				Class Works	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge &	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
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	1	1	1
	b5	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
	c3	1		1	1	1	1							1					1	1	1	1	1
	c4	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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: Quizzes & Reports	Weekly	10
Mid-Term Exam	6th. Week	10
Practical Exam	15th. week	20
Written Exam	16th. week	60
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: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF412: 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: September 2015

B - Basic information

Title: Industrial Operations Research **Code:** MNF412 **level:** senior 1, Frist semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 2 **Practical:-**
Prerequisites: -

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).

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 (LP) sensitivity analysis.	2	2	-
3. Linear Programming applications for industrial plants	2	2	-
4. Transportation model solution and applications	4	4	-
5. Assignment problem, applications in production lines	4	4	-
6. Integer linear programming applications	4	4	-
7. Project scheduling: PERT, CPM	4	4	
8. Network models applications for production line	2	2	
9. Waiting line models	2	2	
10. Decision analysis	2	2	
11. Dynamic Programming Applications	2	2	
Total	30	30	-

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations	Discussions &	Tutorials	Problem						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term	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
	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	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Lecture notes, On Operations Research, by M. Merdan, Ph. D., 2013

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. M. Merdan
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF413:Automatic Control

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 2015

B - Basic Information

Title: Automatic Control **Code:** MNF413 **Year/level:** Senior 1, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2
Pre-requisite: MTH 203

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.

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	4	
• Transfer functions, definition and case studies	4	4	
• Block diagrams; conventions, block diagram algebra and reduction of block diagrams.	3	2	
• Signal flow graphs; definition, conventions and Mason's formula	3	-	
• Time domain analysis			
• Transient response of proportional, integrating and first order elements.	3	2	
• Transient response of second order elements. Effect of location of roots of characteristic equation on the transient response	4	4	
• System identification based of the transient response.	3	2	
• Instruments, sensors and controllers			10
• Level control			4
• Flow control			4
• Speed control			4
• Temperature control			4
• Robotic arm control			4
• Frequency response			
• Frequency response; Polar plot and Bode plots.	3	2	
• System identification based of the transient and frequency responses.	3	2	
• Accuracy of feedback systems; steady state error.	3	2	
• Stability of feedback systems; Routh-Herwitz and Nyquest stability criteria.	3	2	
• Root locus analysis	2	-	
• Compensation of control systems	3	2	
• Design and tuning of P, PI and PID controllers	3	2	
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1			1											1		1		1			
	a2	1			1											1		1		1			
	a3	1	1		1	1						1	1			1		1	1	1			
	a4	1	1										1					1					
	a5	1	1		1	1						1	1			1		1	1	1			
	a6	1	1		1											1		1	1	1			
	a7	1			1											1		1	1	1			
	a8	1																		1			
	a9	1	1		1	1							1			1		1	1	1			
	a10						1										1		1				
Intellectual Skills	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				
Genera l Skills	d1											1	1						1	1			
	d2											1							1	1			
	d3											1							1	1			

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Non

6-2 Required books

M. Galal RABIE, Automatic Control for Mechanical Engineers, ISBN 977-17-9869-3

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

http://csd.newcastle.edu.au/course_notes.html
http://www.facstaff.bucknell.edu/mastascu/eControlHTML/CourseIndex.html
http://www.williamsonic.com/BodePlot/
http://www.softintegration.com/webservices/control/

7- Facilities required for teaching and learning:

- Automatic Control Lab.
- Computer, Data show and Computer programs; MATLAB, CODAS and TK-Solver

Course coordinator: Prof. Dr. M Galal Rabie
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 421: 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: September 2015

B - Basic Information

Title: Joining processes **Code:** MNF 421 **Year/level:** Senior 1,first semester
Credit Hours:3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2
Pre-requisite: MNF 212

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, filter 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. Filter 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, polyster, 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, B21)

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, C22).

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	Intellectual skills	B1, B2,B3, B5, B6, B13, B15 , B21
C	Professional and Practical Skills	C1, C3, C5, C6, C12,C13, C16, C17, C22
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	2	1	2
• Soldering and brazing. Practice of soldering. Joint types and preparation. Fluxes. Heat sources and heat transfer. Different types of brazing. Braze welding.	4	2	4
• Welding. Oxy-acetylene welding, arc welding, resistance welding, spot welding, electron beam welding, thermite welding, MIG< TIG, and MAG etc. Practice, joint design and preparation. Filler materials	4	4	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.	3	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.	3	2	3
• Inspections and tests of welds and joints. Mechanical testing. Non-destructive testing. Weld defects.	3	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	2	4
• Joining of ceramics. Metal/ceramic joining and ceramic/ceramic joining. Thermo-chemical considerations.	4	2	4
• Diffusion bonding. Brazing methods. Joint design	3	1	3
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method								
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory					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				
	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)
Semester work: seminars, quizzes, assignments, and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Lecture notes and handouts

6-2 Required books

De Gamo E. P. , Black J.T. & Rosher R. A. , "Material and Processes in Manufacturing", Macmilan Publisher Co. , 2004.

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:

None

6-5 **Periodicals, Web sites, etc.:** None

http://www. Simple Wikipedia.org/wk/Laterials_science

http://www. Matsci.com

http://www. Homework- help- secrets.com/atomic-structure.html

7- Facilities required for teaching and learning:

1. Lecture room
2. Computer , data show
3. Welding workshop.
4. Mechanical testing lab.

Course coordinator: Assist. Prof. Adel Elgamal
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology

Manufacturing Engineering and Production Technology Department

Course Specification
MNF 422: 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: September 2015

B - Basic Information

Title: Computer Numerical Control (CNC) **Code:** MNF 422 **Year/level:** Senior 1, first Semester
Teaching Hours **Credit Hours: 3** **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: MNF 313

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)	2	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	2	1	3
• Definition of different strategies of external and internal turning	4	2	4
• 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	4
• 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	**30**	**15**	**30**

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

6- List of references:

6-1 Course notes:

Lecture notes.

6-2 Required books:

Software manuals.

6-3 Recommended books:

James V. Valentino, Ed V. Goldenberg and AAA Predator, Introduction to Computer Numerical Control, 5th Edition, Prentice Hall, 2012

6-4 Periodicals, Web sites, etc.

- http://www.cncci.com/resources/articles/what%20is%20cnc.htm
- http://www.ehow.com/how-does_5007907_cnc-machines-work.html
- http://www.cnccookbook.com/CCCNCGCodeCourse.htm

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. Atef Afifi
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Manufacturing Engineering and Production Technology Department

Course Specification
MNF 423: 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 2015

B - Basic information

Title: Computer Aided Design **Code:** MNF 423 **Level:** Senior, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: MNF 312

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, 3, 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	6	3	6
CHAPTER 7: Design Optimization	6	3	6
Total hours	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations &	Discussions &	Tutorials	Problem	Laboratory &					Researches	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			
	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 Professio	c1	1	1		1	1	1									1	1	1	1	1			
	c2	1			1											1		1	1	1			
General Tran	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	10 points
Mid-Term Exam	Eighth week	10 points
Practical Exam	Fifteenth Week	20 Points
Written Exam	Sixteenth week	60 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: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 425: 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 2015

B - Basic Information

Title: Modern Manufacturing Methods **Code:** MNF425 **Level:** Senior 2, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: MNF 321

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 fishing systems	2	4	4
➢ EDM control parameters and main applications	3	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	4	
• Electro-chemical boring and Electro-chemical griming applications	2	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	6
➢ Hybrid-Nontraditional methods and its applications	2	4	
➢ Environmental and economic considerations when applying Non-traditional methods	1	2	
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1		1			1					1				1			1				
	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.	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	10
Mid-Term Exam	7-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

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: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF431: Heat Transfer

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 2015

B - Basic Information

Title: Heat Transfer **Code:** MNF 431 **Year/level:** 7th.semester
Credit Hours:3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 1
Pre-requisite: MNF 314

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 to evaluate 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	Intellectual skills	B1, B2, B5, B13, B16
C	Professional and practical 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	2
- Cylindrical surfaces, and	4	2	2
- Spherical surfaces	4	1	1
● Heat transfer through fines and extended surfaces	4	2	2
● Unsteady heat transfer problems analysis	4	2	2
Heat transfer by convection			
● Natural convection	2	2	2
● Forced convection	2	2	2
Heat transfer by radiation	2	2	2
Total hours	**30**	**15**	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1		1					1				1		1	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			
	c5						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)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6.1 Course notes

Lecture notes and handouts

6.2 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

- Students are required to use own PCs
- Heat transfer Lab.
- Computer, Data show and Computer programs

Course Coordinator: Dr. Metwally H. Metwally
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 432: Mechanical Vibrations

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 2015

B - Basic Information

Title: Mechanical Vibrations **Code:** MNF432 **Year/level:** Senior-1, first semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Prerequisites: MNF 213, MNF 215, MTH 203

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the student should be able to derive mathematical models for physical systems with reasonable simplicity in the form of differential equations. Also, he will 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 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 vibrations (A1, A13).
a2- Classifications and specifications of dynamic systems (mechanical, electrical, hydraulic, thermal) (A3)
a3- The interactions between subsystems and their influence on proper design of systems (A4), (A18)
a4- Prediction of system response in time and frequency domains (A5)
a5- Methods of calculating and analyzing the characteristics of a dynamic system ((A1)

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Deduce the equations of motion of a dynamic system, select proper assumptions. (B1, B2,B13)
b2- Investigate the effects of different parameters on the system function and performance. (B1, B13)
b3- Identify natural frequencies of systems at hand, study resonance phenomenon, and suggest solutions. (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, design, and engineering practice to specify the motion of the dynamic system and get its response.(C1)
c2- Study the effect of different parameters on the dynamic system performance. (C1, C17)
c3- Suggest several possible solutions to improve system performance and clarify which solutions are feasible. (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 references, journals and internet (D7)
d2- Present data and results orally and in written form (D3, D9).
d3- Communicate with others through reports and seminars (D3, D1)
d4- Practice self-learning (D7)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A3, A4, A5, A13, A18
B	Intellectual skills	B1, B2, B13
C	Professional and practical skills	C1, C2, C3, C17
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to system dynamics System Classifications (Mechanical, electrical, and hydraulic systems) and basic functions	2		
Basic concepts of vibrating systems and the equations of motion of the vibrating elements.	4		
Response of free vibrating systems with single and multiple degree of freedom	6	7	
Response of single and multiple degree of freedom systems undergoing different forcing functions	8	8	
MATLAB simulation (single degree of freedom systems)			12
Mechanical-electrical and mechanical-hydraulic analogies.	4		
Vibration absorbing techniques.	2		
Vibration measurements	2		6
Machine monitoring conditions using system dynamic analysis.	2		
MATLAB simulation (multiple degree of freedom systems)			12
Total hours	**30**	**15**	**30**

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	Written Exam
Knowledge & Understanding	a1	1	1	1	1	1							1					1	1	1	1	1	1
	a2	1	1	1																	1		1
	a3	1			1	1						1	1						1	1	1		1
	a4	1	1	1	1	1							1					1	1	1	1	1	1
	a5	1											1								1		1
Intellectual Skills	b1	1	1		1	1													1		1		1
	b2	1	1		1	1												1	1		1		1
	b3	1			1	1													1		1		1
Applied Professional Skills	c1	1			1	1							1						1	1	1	1	1
	c2	1	1	1	1	1							1					1	1	1	1	1	1
	c3	1			1	1							1						1		1	1	1
General Tran. Skills	d1												1					1					
	d2	1	1	1	1	1							1					1			1		1
	d3	1	1	1	1	1							1					1					
	d4		1										1					1					

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

Lecture notes: Gaafar A. H. "Mchanical Vibrations", Printed lectures, Modern Academy of Engineering and Technology

6-2 Required books

Rao S. "Mechanical Vibrations", Third Edition, Addison-Wesley Publishing Company, 1995, ISBN 0-201-52686-7.

6-3 Recommended books:

Ogata K. "System Dynamics", Third Edition, Prentice Hall, 1998, ISBN 0-1-950537-7

6-4 Periodicals, Web sites "Vibrations".

7- Facilities required for teaching and learning:

- Computer with MATLAB Software
- Data show

Course coordinator: Assist. Prof. Gaafar Ahmed Hussein
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF433: 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: September 2015

B - Basic Information

Title: Production and Operation Management **Code:** MNF 433 **level:** Senior 1, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
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 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 plns 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.
d4- Search for information's in references and in internet (D7).

Course Contribution in the Program ILO's

ILO'S		Program ILO'S
A	Knowledge and understanding	A1, A5,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
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	30	30	15

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentatio	Discussions	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
	b7	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
	c5	1			1															1			1
General Tran. 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	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes Lecture notes & workshop training notes

6-2 Required books

6-3 Recommended books William j. Stevenson, " Operations managements", Printic 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: Prof. Ahmed Kohail
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF461 : 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 2015

B - Basic Information

Title : Project-1 **Code:** MNF461 **Year/level:** Senior 1 ,8th semester
Credit Hours: 3 **Lectures:**1 **Tutorial:** **Practical:6**
Pre-requisite: None

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
• The project requires the following steps to be carried out: ✓ 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.	15		90
Total hours	**15**		**90**

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	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)
Evaluation of the Project	12th week	100
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:	Dr. Abdelmagid A. Abdalla
Head of the Department:	Dr. Abdelmagid A. Abdalla
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF462 : 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 2015

B - Basic Information

Title: Industrial training (1) **Code:** MNF 462 **Year/level:** Senior 1,7th semester
Credit Hours: **Lectures:** 1 **Tutorial:** - **Practical:** 4
Pre-requisite: None

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
• Practical industrial training for six weeks- during the 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: ✓ 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)	6		24
Total hours	**6**		**24**

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									
Aplied 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)
Report from student of the training	By the end of the training period	100
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:	Dr. Abdelmagid A. Abdalla
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 511: 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: September 2015

B - Basic Information

Title: Quality Control and Quality Mar **Code:** MNF511 **Year/level:** Senior 2 ,10th semester
Teaching Hours: Credit:: 3 **Lectures: 2** **Tutorial: 1** **Practical: 2**
Pre-requisite: MTH 305

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.
a2 - The methods, and plans used for acceptance sampling.
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.
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.

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).

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, B11
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
• Quality improvement techniques	2	1	2
• Total quality management (TQM)	2	1	2
• Quality cost	2	1	2
• Fundamentals of statistics and quality	2	1	2
• Control charts for variables	4	2	4
• Fundamentals of probability and quality	4	2	4
• ISO quality systems	4	2	4
• Acceptance sampling plans	2	1	2
• Acceptance sampling systems	2	1	2
• Reliability and quality	2	1	2
• Computers and quality control	2	1	2
Total hours	**30**	**15**	**30**

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	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	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	10
Mid-Term Exam	8-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		**100**

6- List of References

6-1 Course notes

Lecture Notes and Handouts.

6-2 Required books:

A.M.Kohail," Selected Topics in Quality Control", Cairo, 2008.

6-3 Recommended books:

Dale Bester field, "Quality Control", Prentice Hall, 1998.

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

7- Facilities Required for Teaching and Learning

- Computer lab equipped with required software.

Course Coordinator:	Prof. Dr. Ahmad Kohail
Head of the Department:	Dr. Abdelmagid Abdelatif.
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 521: 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: September 2015

B - Basic Information

Title: Computer Aided Manuf. **Code:** MNF521 **Level:** Senior 2, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**-- **Practical:** 2
Pre-requisite: MNF 422

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		
Part programming using tool compensation (length and radius)	4		2
Canned cycles of CNC milling	3		4
Canned cycles of CNC turning	3		4
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	4		4
Computer Aided Process Planning	4		6
Total hours	**30**		**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and [illegible]	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	d1		1	1							1							1				
	d2		1	1							1							1				

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

Lecture notes & 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, Computer Numerical Control (Advanced techniques), McGraw-Hill Inc., 1993

7- Facilities Required for Teaching and Learning

Lecture room ,
CNC laboratory
Software and local computer network

Course Coordinator: Dr. Atif Afifi
Head of the Department: Dr. Abdelmagid Abdelatif.
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 522: 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: September 2015

B - Basic Information

Title: Hydraulic Power System **Code:** MNF522 **Level:** Senior 2, First Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: MNF 311

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, 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.	3	4	1
➢ Hydraulic transmission lines and connectors	1	2	1
➢ Hydraulic pumps:		4	2
• 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	4	1
➢ Small project; design and analysis of the hydraulic system for an industrial application. Analysis of the possible operational problems...	3	2	4
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & 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			
	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)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

M Galal Rabie, Fluid Power Engineering, McGraw-Hill. NY, 2009

6-3 Recommended books: Non

- **M Galal Rabie**, Automatic Control for Mechanical Engineers, ISBN 977-17-9869-3, 2010
- **Ibrahim Saleh and M Galal Rabie,** Fluid Mechanics for Engineers, ISBN 978-977-5092-00-7, 2011

6-4 Periodicals, Web sites, etc.

http://www.moog.com/,
http://www.boschrexroth.com/en/xc/,
http://www.norgren.com/global/
http://www.eaton.com/Eaton/index.htm
http://www.nfpa.com/

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: Prof. Dr. M Galal Rabie
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF523: 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 2015

B - Basic information

Title: Production aids design **Code: MNF523** **level:** Seniors 2,First semester
Credit hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite: MNF321

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	2
Guide elements for jigs	2	1	2
Milling, turning and grinding fixtures	4	2	4
Press tool design	2	1	2
Bending, forming and drawing dies	4	2	4
Forging die design	2	1	2
Plastic molds design	2	1	2
Materials for dies	2	1	2
Process planning and estimation for production aids	4	2	4
Total	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method								
		Lecture	Presentations & Movies	Discussions & seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches & 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 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)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Lecture notes: Manufacturing Technology (3), by M. Merdan, Ph. D., 2010
Lecture notes: CNC part programming, by A. Afifi, Ph. D., 2010

6-2 Essential books (text books): None

6-3 Recommended books: G.R. NAGPAL, " Tool Engineering & Design", Khanna publisher, 2005.
6-4 Periodicals, Web sites, etc. None
6-6 Technological Tables: None

7- Facilities required for teaching and learning:
Lecture Room, CNC Lab

Course coordinator: Dr. M. Merdan, Dr. A. Afifi
Head of the Department: Dr Abdelmagid Abdelatif.
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 524: Industrial Thermal 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: September 2015

B - Basic Information

Title: Industrial Thermal Systems **Code:** MNF 524 **Year/level:** Senior-2, second semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Prerequisites: MNF 314, MNF 411

C - Professional Information

1 – Course Learning Objectives:

By the end of this course the student should be able to choose the appropriate of furnaces, refrigeration and air conditioning systems. He also should 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- Classifications and specifications of melting furnaces, heat treatment bathes, heating boilers, thermal insulators, and HVAC systems. (A13)
a2- The principles of operations of furnaces, boilers, insulators, HVAC systems. (A4, A13).
a3- Engineering design principles, Construction and operation of furnaces, boilers, insulators, and HVAC systems. (A18)

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, heat treatment bathes, thermal insulators, and HVAC systems based on analytical thinking. (B2)
b2- Investigate the effects of different parameters on the function and performance of the studied industrial thermal systems. (B1, B13)
b3- Investigate and analyze the failures of components of the studied industrial thermal systems and suggest solutions. (B6, B2)

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 industrial thermal systems. (C1)
c2- Evaluate and analyze the basic parts and components of the industrial thermal systems. (C1, C17).
c3- Suggest possible solutions to improve the performance of components of the industrial thermal systems. (C2, C3, C17)

d - General and transferable skills:

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

d1- Communicate with others through written reports and seminars. (D3, D1)
d2- Present data and results orally and in written form (D3, D9).
d3- Search for information in references and internet. (D7)
d4- Practice self-learning (D7)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A4, A13, A18
B	Intellectual skills	B1, B2, B6, B13
C	Professional and practical skills	C1, C2, C3, C17
D	General and transferable skills	D1, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Classifications of metal melting furnaces and operating principles of each	4		4
The meaning of furnace efficiency and the parameters considered to achieve efficient operation of furnaces, performance evaluation of different furnaces	4	4	
Heat recovery techniques and estimation of fuel saving in furnaces.	2	2	2
Operating principle of heat treatment salt bath furnaces, their description, performance evaluation, and development	2	2	4
Types of forging heating furnaces, their technical features and performance	2		4
Principle of operation of induction furnace, features, construction, types, advantages and disadvantages	2		4
Meaning of slag and mechanism of its formation, slag classification and its foaming characteristics, slag metal refining	2		
Heating boilers: operating principles, types, working pressures and temperatures, main components, safety issues, best practices for efficient operation, boiler control, boiler performance evaluation.	6	3	6
Temperature measurement and control in industries: temperature measurement inside furnaces, flue gas channels, in large tanks, in metal melting and salt baths, in plastic extruders, in heat exchanger pipes, in housings and walls, in bearing shells. Temperature control techniques.	2		2
Refrigeration and air conditioning: processes, basic components, control, applications.	4	4	4
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & M...	Discussions & ...	Tutorials	Problem ...						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term	Practical Exam	Written Exam
Knowledge & Understanding	a1	1	1	1	1	1							1					1	1	1	1	1	1
	a2	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
	b2	1	1		1	1												1	1		1		1
	b3	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	1	1	1
	c3	1			1	1							1						1		1	1	1

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

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

Lecture notes: 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: "Thermal Systems".

7- Facilities required for teaching and learning:

- Computer with MATLAB Software
- Data show

Course coordinator: Assist. Prof. Gaafar Ahmed Hussein
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification

MNF 530: 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 2015

B - Basic Information

Title: Advanced Forming Techniques **Code:** MNF 530 **Year/level:** Senior 2, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2
Pre-requisite:

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.	2		2
➢ Conventional metal forming:			
• Classification and basics	2		2
• Rolling & forging	2	2	2
• Drawing & Extrusion	2	2	2
➢ Advanced Metal forming techniques:			
➢ High energy forming- process and machines	2		2
• High energy forming- theoretical aspects	2		2
➢ High rate forming- process and machines	2	2	2
• High rate forming- theoretical aspects	2		2
➢ Stretch Forming- process and machines	2	2	2
• Stretch Forming- theoretical aspects	2		2
➢ Explosive forming- process and machines	2	2	2
• Explosive forming- theoretical aspects	2	2	2
➢ Super plastic forming- theory, process and machines	2	2	2
➢ Hydroforming- theory, process and machines	2	2	2
➢ Special rolling Techniques- theory, process and machines	2	2	2
Total hours	**30**	**16**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	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)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

Klpakjian, Serope and Steven R. Schmidt '"Manufacturing Engineering and Technology". Prentice –Hall Inc., 2001.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

- Metal forming lab. (some of these machine could be products of good BSc. Projects)
  - Rolling mill
  - Thread rolling and surface rolling machine
  - Hydraulic press (100 tons)
  - Draw benches for tubes and rods
  - Extrusion machine
  - Hydraulic pump
  - Dies for bulk and sheet metal forming
  - Computer, Data show and Computer programs

Course coordinator: Prof. Dr. M Kamal Shokry
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF531: Modeling & Simulation

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology
Department offering the program: Manufacturing Engineering & Production Technology Dept.
Department offering the course: Manufacturing Engineering & Production Technology Dept.
Date of specifications approval: September 2015

B - Basic Information

Title: Modeling & Simulation **Code:** MNF 531 **Year/level:** 5-th year / 2-nd Term
Teaching Hours: 3 **Lectures:** 2 **Tutorial: 1** **Practical:** 2-
Pre-requisite: MNF 313

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:
Build mathematical models for real systems and identify the practical difficulties and possibilities in solving the model. Develop computer based simulation programs to evaluate the system performance. Use scientific and process simulation packages in solving complicated systems

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

By the end of the course the student should gain the following knowledge:
a1- The process of building a simulation model for real systems (A1, A3, A5, A18)
a2- The computer based techniques used to evaluate the system performance.(A15, A17, A8)
a3- The different available simulation packages and their application.(A5, A8, A18)

B - Intellectual skills

By the end of the course the student should be able to:
b1- Analyze real systems and the interaction between the bodies involved. (B1, B2, B5, B13)
b2- Build the equations describing the behavior of the system. (B1, B7, B11, B13)
b3- Develop computer programs to evaluate the system behavior. (B3, B5)
b4- Apply the most common simulation packages in industrial and manufacturing processes. (B13, B17)

C - Professional and practical skills

By the end of the course the student should be able to:
c1- Model and Simulate different industrial and manufacturing processes. (C1, C6, C7)
c2- Build and run computer programs to evaluate the system behavior. (C5, C17, C19)
c3- Use available commercial software in industrial and manufacturing applications. (C5, C6, C7)

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)
d4- Present finding of scientific research in seminars and reports. (D1, D3, D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A5, A8, A15, A17,A18
B	Intellectual skills	B1, B2, B3, B5, B7, B11, B13, B17
C	Professional and practical skills	C1, C5, C6, C7, C17, C19
D	General and transferable skills	D1, D3, D4, D6

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• The basic components of a simulation model		-	
• Basic Simulation Concepts • Measures of Performance Statistics • The Effect of Operating Characteristics on Managerial Decisions	2	1	
• Problem Formulation			
• Formal Problem Statement • Orientation • Project Objectives	4	2	
• Project Planning		3	
• Project Management Concepts • Simulation Project Manager Functions • Developing the Simulation Project Plan • Compressing Projects • Example Gantt Chart • Advanced Project Management Concepts	2 2 2		
• Development of simulation models		1	
• System Definition		3	
• System Classifications • High-Level Flow Chart Basics • Components and Events to Model • Data to Be Included in the Model • Output Data-performance measure	2 2 2		
• Input Data Collection and Analysis		2	
• Sources for Input Data • Collecting Input Data • Deterministic versus Probabilistic Data • Discrete vs. Continuous Data	2 2		
• Model Translation		1	
• Simulation Program Selection • Model Translation Section Content	2		2
• Model Verification and Validation		2	
• Divide-and-Conquer Approach • Animation • Simplifications • Limitations • Types of Validation • Validation Data Analysis Process	2 2		2 2
• Experimental Design and Analysis		1	
• Factors and Levels • Factor Experimental Designs • Terminating and nonterminating System Analysis	2		2
• Applications of simulation modeling.			
• How Simulink Works • Overview on Lagrangian DAE and examples • Exercise 1: Atwood's Machine • Exercise 2: Ball on Wheel • Simulation Modeling for Control Systems- Train System • PID Control- Simple mass, spring, and damper problem			2 2 2 2 4 2 2

• A Short Introduction to Elements Modeling Platform- A car drives on a bumpy road • Bus Suspension Modeling • DC Motor Position Modeling in Simulink			4 2
• Revision			
Total hours	**30**	**15**	**30**

4 - Teaching and Learning Methods

Course ILO's		Teaching Methods										Learning Methods			Assessment Method							
		Lecture	Presentations	Discussions &	Tutorials	Problem	Laboratory					Modeling	Self-learning	Experimental			Class	Quizzes	Reports	Mid-Term	Practical Exam	Written Exam
Knowledg &	a1	1	1											1				1		1	1	1
	a2	1	1											1				1		1		1
	a3	1	1											1				1		1		1
Intellectu al Skills	b1	1	1											1							1	1
	b2	1	1											1							1	1
	b3	1	1											1							1	1
	b4																					
Applied Prof. Skills	c1	1	1											1							1	1
	c2	1	1											1							1	1
	c3	1	1											1							1	1
	c4	1	1											1							1	1
	c5	1	1											1							1	1
General Trans Skills	d1				1								1									
	d2				1								1									
	d3				1								1									1
	d4				1								1									1

5- Students' Assessment Methods:

Tools	Time schedule	Grading
Assignments	Weekly	10
Mid-term exam	Week 8	10
Practical Exam	Week 16	20
Final written exam	Week 16	60
	Total	100

6- List of References

6-1 Course notes

Lecture Notes and Handouts

6-2 Required Book:

Christopher A. Chung, "Simulation Modeling Hand Book, A Practical Approach**",** Industrial And Manufacturing Engineering Series**,**SERIES EDITOR Hamid R. Parsaei,2004 by CRC Press LLC

6-3 Periodicals, Web sites, etc.: Non

7- Facilities Required for Teaching and Learning: Non

Course Coordinator: Dr. Bakr M. Rabeeh
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 532: Failure Analysis and Fracture

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 2015

B - Basic Information

Title: Failure Analysis and Fracture **Code:** MNF532 **Level:** Semester 9
Credit Hours: 3 **Lectures:** 2 **Tutorial/Exercise:**1 **Practical:** 2
Pre-requisite: MNF 211

C - Professional Information

1 – Course Learning Objectives:

A study of this course will enable the student to design and select materials in engineering structures which are more resistant to fracture.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

By the end of the course the student should gain the following Knowledge and understand:

a1- Types of stresses Principle stresses & strains and its graphical representation in 3 dimensional (A1،A3،A4)
a2- Principles of fracture mechanics stress concentration , stress analysis of crack(A1، A3) .
a3- Plastic behavior of solids. Effects of defects and work hardening , mechanism of slip and its application .
a4- Micro - mechanics of fracture and mode of failure (A18, A24).

b - Intellectual skills:

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

b1- Investigate the failure of components , systems and process(B6).
b2-Analyse the mode of failure in components(B11).

c - Professional and practical skills:

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

c1-Re- design component or system against early failure (C1,C4) .
c2- Use laboratory equipment to describe quantitatively fatigue crack propagation under different loading conditions(C16,C17) .

d - General and transferable skills:

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

d1-Collaborate effectively with multidisciplinary team (D1).
d2-Search for information which are in detail elsewhere (D7).
d3-Refer to relevant literatures (D9).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1،A3،A4،A13،A18, A24
B	Intellectual skills	B6،B11
C	Professional and practical skills	C4،C16، C17
D	General and transferable skills	D1, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
➢ Types of stresses – stress at a point & resultant stress	4	3	3
➢ Principal stress & strain in 3 dimensional – Mohr's circle	4	3	4
➢ Application of stress function concept to eng. Problems	4	3	3
➢ Plastic behavior of solids. Effects of defects and work hardening mechanics of slip	6	3	3
➢ Plastic bending & torsion of case hardened materials	4	3	3
➢ Principal of fracture mechanics – stress concentration , stress analysis of cracks , fracture toughness .	4	3	4
➢ Design using fracture mechanics experiments results and crack growth models	4	3	4
Total hours	**30**	**21**	**24**

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 & 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
Intellectual Skills	b1	1		1	1	1												1	1		1		1
	b2	1		1	1	1						1						1	1		1		1
Applied Professional	c1	1		1	1													1	1		1		1
	c2	1		1	1													1	1		1		1
General Tran. Skills	d1	1		1	1								1	1				1	1				
	d2	1		1	1								1	1				1	1				
	d3	1		1	1								1	1				1	1				

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Points)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	8th. Week	20
Written Exam	16th. week	70
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

- Timo shenko & Goodier "Theory of Elasticily" 1994 .
  Sinigh S . "Theory of plasticity K Forming Process" 2005 .

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

- Fatigue Testing Machines
- Analyzer and samples for different types of fracture.

Course coordinator:	Prof. Dr. Mamdouh Saber
Head of the Department:	Dr. Abdelmagid Abdelatif
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 533: Rapid Prototyping and Tooling

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 2015

B - Basic Information

Title: Rapid Prototyping and Tooling **Code:** MNF533 **Year/level:** Senior 2, Second Semester
Credit Hours: **Lectures:** 2 **Tutorial:**1 **Practical** : 2
Pre-requisite: MNF313

C - Professional Information

1 – Course Learning Objectives:

After completing the course, the student will be able to:

- Select a suitable rapid prototyping technology.
- Identify the needed data for production of a prototype.
- Define and implement a complete production plan.
- Implement the preproduction process.
- Operate the required rapid prototyping technology.

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 nature of the overall process from design conceptualization to prototype implementation and evaluation (A4, A8, A12, A21)
a2- The current available rapid prototyping systems, their fundamental operating principles, and their characteristics (A13, A17)
a3- The importance of Rapid prototyping techniques in development of Rapid Tooling for selected production technologies (A4, A18)
a4- The complementary, secondary fabrication processes commonly used with the above rapid prototyping system (A4)
a5- Selection of the appropriate fabrication technology, or technologies, for a given prototyping task.(A4, A24)

b - Intellectual skills:

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

b1- Investigate components, subassemblies, assemblies as well as complete product and understanding function and parameters affecting performance. (B5)
b2- Select appropriate manufacturing method considering design requirements. (B2).
b3- Think in a creative and innovative way in problem solving and design by rapid prototyping technology. (B3)

c - Professional and practical skills:

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

c1- Design, assemble, operate, test and maintain components and complete products (C2, C14)
c2- Create and/or re-design a process, component or system, and carry out specialized Rapid prototype (C3)
c3- Develop simple prototyping project management plan. (C9, C21)
c4- Exchange rapid prototyping project information skills with engineering community and industry (C11)

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- Communicate effectively and present data and results orally and in written form. (D3)
d3- Use ICT facilities in presentations. (D4)

d4- Refer to relevant literature (D4) .

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A4، A8, A12, A13، A17, A18, A21, A24
B	Intellectual skills	B2, B3،B5
C	Professional and practical skills	C2،C3، C9, C11, C14, C21
D	General and transferable skills	D1, D3, D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1-Product development Cycle 3%	**1**	**1**	**1**
2-Influence of Innovation on product development 2 %	**1**	**1**	**1**
3-Reverse Engineering 5%	**2**		**2**
4 : Overview of rapid prototyping 10%	**3**	**2**	**3**
4.1: What is Prototyping?			
4.2: Types of Prototypes			
4.3: Prototypes and the Engineering Cycle			
4.4: Prototypes and Concurrent Engineering			
4.5: Time to Market			
5 Rapid prototyping technologies 20 %	**6**	**3**	**6**
5.1: Stereolithography (SLA)			
5.2: Selective Laser Sintering (SLS)			
5.3: Laser Powder Forming (LPF)			
5.4: Laminated Object Manufacturing (LOM)			
5.5: Fused Deposition Modeling (FDM)			
5.6: Solid Ground Curing (SGC)			
5.7: 3D Ink Jet Printing			
5.8: Shape Deposition Manufacturing (SDM)			
6: The underlying material science (10%)	**3**	**2**	**3**
6.1• Photopolymers			
6.2• Thermoplastics			
6.3• Powders			
7. Generating CAD models suitable for automated fabrication (10%)	**3**	**1**	**3**
7.1• The .STL file format			
7.2• Repairing CAD models			
7.3• Adding support structures			
7.4• Model slicing			
8. Secondary processing (15%)	**3**	**1**	**3**
8.1• RTV silicone rubber molds			
8.2• Investment casting			
8.3• Improving the quality of prototyping			
8.4• Improving the productivity in manufacturing			
8.5• Medical applications			
9. The future (5%)	**2**	**1**	**2**
9.1• Remote manufacturing on demand			
9.2• Ongoing research activities			
9.3• How can these technologies be improved?			
10. Creating Simple Prototypes 10%	**3**	**1**	**3**
10.1: Fundamental Activity			
10.2.: Advanced Activity			
11. (Project): Creating a Solution 10 %	**3**	**2**	**3**
11.1F: Fundamental Project			
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessement methods:

Course ILO's		Teaching Methods										Learning Methods				Assessement Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizes	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
	a4	1	1		1																1		1
	a5	1	1		1																1		1
Intellectual Skills	b1	1	1		1																1		1
	b2	1	1		1																1		1
	b3	1	1		1																1		1
Applied Professional	c1	1					1															1	
	c2	1					1															1	
	c3	1					1															1	
	c4	1					1															1	
General Tran. Skills	d1	1					1																
	d2	1					1																1
	d3	1																					
	d4	1																					1

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Non

6-2 Required books

1- Rafiq Noorani, *Rapid Prototyping: Principles and Applications*, John Wiley & Sons, Inc., 2006, ISBN 0-471-73001-7

2- Rapid Prototyping - Rapid Tooling - Rapid Manufacturing, Andreas Gebhardt, Hanser Verlag, 2007, ISBN 3446226664, 9783446226661

3- Rapid prototyping, Chee Kai Chua, Kah Fai Leong, C. Chu Sing Lim, World Scientific, 2010, ISBN 9812778985, 9789812778987

4- D. T. Pham BE, Applications of Rapid Tooling Technology Springer London, 2001, ISBN 978-1-4471-1182-5

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

Educational web sites in the field of Rapid prototyping, CAD, CAM & Rapid tooling

Educational Video clips in field of Rapid prototyping, CAD, CAM & Rapid tooling

7- Facilities required for teaching and learning:

- CAD/CAM labs.
- Rapid prototyping Labs
- Computer, Data show and Computer program.

Course coordinator:	Dr. Amro Fikry
Head of the Department:	Dr. Abdelmagid Abdelatif
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification

MNF 534: 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 2015

B - Basic Information

Title: Automation in Production and Computer Integrated Manufacturing **Code:** MNF 534 **Level:** Senior 2, First Semester

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

Pre-requisite: MNF 521

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	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1		1					1				1		1	1				
	a2	1			1											1		1	1	1			
	a3	1			1											1		1	1	1			
	a4	1	1	1	1	1	1					1				1		1	1	1			
	a5	1					1									1	1	1	1	1			
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	10
Mid-Term Exam	7-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

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 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 535: 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 2015

B - Basic Information

Title: Advanced Facility Planning **Code:** MNF 535 **Year/level:** Senior 2, Second Semester
Credit Hours: 3 **Lectures:** 2 **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).

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		
➢ Facilities location problems	2		
➢ Single facility location problems	2	2	4
➢ Multiple facility location problems	4	2	4
➢ Discrete facility location models	2	2	4
➢ Product, process, and schedule design	4		2
➢ Introduction to Facilities layout	2		2
➢ Flow systems, activity relationships, and space requirements	2	1	2
➢ Layout planning models	2	4	4
➢ Algorithmic approaches for layout design	4	4	4
➢ Material handling system design	2		1
➢ Warehouse operations and warehouse design	2		1
Total hours	**30**	**15**	**30**

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
Ge ner	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	10
Mid-Term Exam	6th week	10
Practical Exam	15th week	20
Written Exam	16th week	60
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. Khaldon T. Meselhy
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 536 : Industrial Robotics

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 2015

B - Basic information

Title: Heat Transfer **Code:** MNF 536 **Year/level:** 8th.semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:** 1 **Practical:** 2
Pre-requisite:

C - Professional information

A study of this course will enable the student to:

- Have a theoretical and conceptual understanding of mathematical models that represent robotic systems in many different ways.
- Have a detailed foundation on kinematics and dynamics that are essential in controlling design and built of robotic machines.
- Actuate the robotic system with a controlled motion by planning motions that should be safe and smooth.
- Establish the interaction with the wall by creating confined motions - which relay on force control that is critical in creating those interactions.
- Have a moderate understanding of how these disciplines applied to the analysis of typical human system motion.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- Genesis and development of the Robotic systems(A1).
a2- Theoretical basics to analyze mathematical models based on kinematic and dynamic foundation (A1,A2).
a3- The principles and fundamentals necessary for motion and force control (A4).
a4- The key parameters of robot control in a free and in a contact space as the robot interact with the wall (A4).
a5- Simulation of human motion with analysis and performance evaluation study for creating good robots controllers (A3).

B - Intellectual skill

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

b1- Develop the mathematical analysis of robotic motion (B1).
b2- Deduce mathematical relations describing the kinematics and dynamics for different safe motion and select the proper methods for designing the robotic machines (B1, B2, B13, B19).
b3- Conduct a detailed investigation on ways of improving the efficiency of motion controller (B5).
b4- Analyze a locomotion performance and perform a planning of a robotic system performance (B5,B16)

C - Professional and practical skills

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

c1- Analyze and test the performance of a manipulator(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 robotic system problems (C1).
c4- Design, and build software tools for robotic systems analysis (C6).
c5- Use computer software, Excel and other available programs to design, and calculate robotic 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	Intellectual skills	B1, B2, B5, B13, B16, B19
C	Professional and practical 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 Robotics Fundamentals	2	2	-
Rigid transformation	2	2	2
Robot anatomy	4	2	4
Kinematics	4	2	4
Inverse kinematics	4	2	4
Jacobins	4	1	4
Trajectory following	2	2	4
Statics	4	2	4
Dynamics	4	2	4
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations	Discussions	Tutorials	Problem	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 Prof. Skills	c1	1	1		1	1	1									1	1	1	1	1			
	c2	1			1											1		1	1	1			
	c3	1		1		1						1	1						1	1			
	c4	1			1	1											1		1	1			
	c5						1										1						
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)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6.1 Course notes

Lecture notes and handouts

6.2 books

- Selig, J. M., "Introductory Robotics ", Prentice Hall, UK, 9th Ed, 1992

6.3 Recommended books

- Kurfess, T. R., "Robotics and Automation Handbook " CRC press, New York, 2005

6.4 Periodical, Web sites, etc.

- http://www.cimtecautomation.com/parts/cCPKnjfu3xbsCFdLItAodyXEAKQ538 -denso-robotics.aspx? gclid
- http://www.learnaboutrobots.com/industrial.htm
- http://www.ifr.org/industrial-robots/http://www.cimtecautomation.com/parts/c-538-denso-robotics.aspx?gclid=CPKnjfu3xbsCFdLItAodyXEAKQ
- http://www.learnaboutrobots.com/industrial.htm
- http://www.ifr.org/industrial-robots/

7- Facilities required for teaching and learning

- Students are required to use own PCs
- Heat transfer Lab.
- Computer, Data show and Computer programs

Course Coordinator: Dr. Metwally H. Metwally
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 537: 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: September 2015

B - Basic Information

Title: Electro-Hydraulic and Pneumatic Systems **Code:** MNF 537 **Level:** Senior 2, Second Semester
Credit Hours: 3 **Lectures:** 2 **Tutorial:**1 **Practical:** 2
Pre-requisite: MNF 522

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	2	1	
➢ Modeling and dynamic performance of hydraulic transmission lines	2	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		2
• 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	2
➢ Small project; investigate the transient performance of a small industrial hydraulic system.			4
Total hours	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and	Discussions and	Tutorials	Problem solving	Laboratory &					Researches and	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					
	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	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 term papers	Bi-Weekly	10
Mid-term written exam.	6-th Week	10
Practical exam	Fifteenth week	20
Written exam	Sixteenth week	60
Total		100

6- List of references:

6-1 Course notes: Non

6-2 Required books

M Galal Rabie, Fluid Power Engineering, McGraw-Hill, NY, 2009.

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

http://www.moog.com/,
http://www.boschrexroth.com/en/xc/,
http://www.norgren.com/global/
http://www.eaton.com/Eaton/index.htm
http://www.nfpa.com/

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:	Prof. Dr. M Galal Rabie
Head of the Department:	Dr. Abdelmagid Abdelatif
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 538: 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 2015

B - Basic Information

Title: Advanced Casting Techniques
Code: MNF 538 **Level:** Senior 2, First Semester
Credit Hours: 3
Lectures: 2 **Tutorial:**1 **Practical:** 2
Pre-requisite: MNF 323

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	4	2	4
➢ Aluminum casting alloys for automotive	3	2	4
➢ Aluminum casting alloys for aircrafts	3	2	4
➢ Copper alloys for valves and machine parts	4	2	4
➢ 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	**30**	**15**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and Reports	Modeling and Simulation			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understanding	a1	1	1	1	1	1	1					1	1			1	1	1		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	10
Mid-term written exam.	7-th Week	10
Practical exam	Fifteenth week	20
Written exam	Sixteenth week	60
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: Dr. Adel Elgamal
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF551: Environmental Studies

A- Affiliation

Relevant program: Mechanical Design and Production Technology BSc Program
Department offering the program: Manufacturing Engineering & Production Technology Dpt.
Department offering the course: Manufacturing Engineering & Production Technology Dpt.
Date of specifications approval: September 2015

B - Basic Information

Title: Environmental Studies **Code:** MNF551 **Year/level:** Senior 2,first semester
Credit Hours: 2 hours **Lectures:** 2 **Tutorial:** **Practical:** -
Pre-requisite **:**

C - Professional Information

1 – Course Learning Objectives:

A study of this course will enable the student to:

- Be familiar with the basic biogeochemical cycles and the role of certain groups of living organisms in pollution control.
- Understand the basic concept of air and water pollution and pollutants.
- In corporate his/her current knowledge related to the route of pollution from industrial sources.
- Recognize and use terms related to the basic physics of sound and understand the principle of the noise control.
- Illustrate the principles and concepts of solid waste management processes.
- Participate effectively in Environment impact Assessment for development.

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 role of human in the environmental pollution. (A1, A11, A3)
a2- The major sources of environmental pollution (A3, A12)
a3- The effect of air and water pollution (A3)
a4- Description and practice of noise control. (A3, A4)
a5- Management of solid waste in order to minimize their effect.(A6, A8, A19,)
a6- The major approaches to prevent pollution from the most common sources.(A6,A8, A9)
a7- Environment Impact Assessment for development of society.(A9, A11)

b - Intellectual skills:

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

b1- Select the proper information and data in description of environment and environmental systems. (B1, B4)
b2- Analyze and give information on the basic causes of environmental disturbances. (B11, B15)
b3- Use the basic scientific knowledge in understanding the nature of environmental problems and be able to quantify them. (B1, B2, B16,B17)

c - Professional and practical skills:

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

c1- Collect and record data and information about the environmental (air, water…) quality and about natural resources.(C9, C11, C12,)

d - General and transferable skills:

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

d1- Cooperate with other students to carry out Environmental Impact Assessment for small projects. (D1, D2, D3, D6)

Course Contribution in Program ILO s

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A3, A4, A6, A8, A9, A11, A12, A19
B	Intellectual skills	B1. B2, B4, B11, B15, B16, B17
C	Professional and practical skills	C9, C11, C12
D	General and transferable skills	D1, D2, D3, D6

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• The concept of the Ecosystem	4	-	-
• Population Growth and the Environment.	4	-	-
• Air Pollution	5	-	-
• Water pollution	3	-	-
• Noise pollution	4	-	-
• Solid wastes	4	-	-
• Environmental Impact Assessment and the Egypt law No.4 of 1994 on the Environment	4	-	-
• Final Revision	2	-	-
Total hours	**30**	**-**	**-**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	a1	1	1	1									1					1	1	1			1
	a2	1	1	1								1	1					1		1			1
	a3	1	1	1								1	1					1	1	1	1		1
	a4	1	1	1									1					1		1			
	a5	1	1	1								1	1							1			
	a6	1	1	1								1	1					1		1			
	a7	1	1	1									1					1		1			
Intellectual Skills	b1	1	1	1								1	1					1		1			
	b2	1											1					1		1			
	b3	1	1	1								1						1		1			
Applied Professional Skills	c1		1	1									1					1		1			
General Tran. Skills	d1		1	1								1	1					1		1			

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes:

Lecture notes and handouts, Revision sheets.

6-2 Required books

- Society Environment and Engineering H.R MukHT, Satya Prakashan, New Delhi (1998)

6-4 Recommended books:

- Hand book of Environment management and technology, Gwendolyn Burke-Wiley inter science (2005)
- Environmental science karen Arms saunders college, publishing (1990)
- قانون البيئه رقم ٤ عام ١٩٩٤ (جمهوريه مصر العربيه)
- Environmental Science, Earth Asaliving planet, Botkin and keller Johmwiley and sons. Inc.(1998)

6-5 **Periodicals, Web sites, etc.**

No periodicals are needed
http:www.epa.gov
http:www. Eeao. Gov. eg

7- Facilities required for teaching and learning:

- Lecturing room
- Films about environmental pollution
- Library

Course coordinator: Assist. Prof. Shaaban Ragab Goda
Head of the Department: Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF552: Industrial Project Management

A- Affiliation

Relevant program: Mechanical Design and Production Technology BSc Program
Department offering the program: Manufacturing Engineering & Production Technology Dpt.
Department offering the course: Manufacturing Engineering & Production Technology Dpt.
Date of specifications approval: September 2015

B - Basic Information

Title: Industrial Project Management **Code:** MNF552 **Year/level:** Senior 1,first semester
Credit Hours: 2 hours **Lectures:** 2 **Tutorial:** **Practical:** -
Pre-requisite **:**

C - Professional Information

1 – Course Learning Objectives:

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

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- What is meant by feasibility study (A3)
a2- definition of a project , project management (A3)
a3- phases of a project, steps of managing a project (A3).
a4- body knowledge of the project management
a5- Roll of the project manager (A1, A4).
a6- Planning the project (A10).

b - Intellectual skills:

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

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Carry out a feasibility study for a new project (C9)
c2- Manage a project (C9).
c3- Solve an operational research problems using different techniques (C9)

d - General and transferable skills:

On successful completion of the course, the student should be able to:
d1- Communicate with others; work in a team and involvement in group discussion and seminars (D3, D1).
d2- Present data and results orally and in written form (D3, D9).
d2- Effectively manage tasks , time, and resources (D6)
d3- Search for information's in references and in internet (D7).
d4- Practice self-learning (D7).

Course Contribution in Program ILO s

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A3, A4, A10
B	Intellectual skills	B9
C	Professional and practical skills	C9
D	General and transferable skills	D1, D3 , D6, D7, D9

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving						Modeling	Self-learning					Seminars	Quizzes	Reports	Mid-Term Exam	Practical Exam	Written Exam
Knowledge & Understanding	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					

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Printed lecture

6-2 Required books

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

6-3 Recommended books: Non

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

7- Facilities required for teaching and learning:

- Lecturing room

Course coordinator: Prof. Dr. Ahmed Sarhan
Head of the Department: Dr. Abdelmagid Abdalla
Date: September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF 553: Industrial Social Impact

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 2015

B - BASIC INFORMATION

Title: Industrial Social Impact **Code:** MNF553 **Level:** Senior 2, Second Semester
Credit Hours:2 **Lectures:** 2 **Tutorial/Exercise:**- **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 industrial impact on economy, training and education, planning of industry, and contribution in the gross national income. In addition to variations happened in the society by industry, and the future of 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- Methodology of analyzing the effect of industry on different concerns of society (A5, A9, A11))
a2- Background data needed to analyze and measure the impact of industrial impact on society (A9, A14).
a3- Effects of industrialization on economy, environmental conditions, and education in the society (A11, A19)
a4- Computer software packages related to the study of sociological effects. (A17).

b - Intellectual skills:

On successful completion of the course, the student should be able to.
b1- Investigate the effect of industry on different aspects of society. (B1, B13)
b2- Deriving some relations describing the effect of industrialization on economy, education, training, and social relations.(B1, B2, B10, B13)
b3- Analyze and interpret the data of the effect of industry on society. (B9, B10, B14, B16)

c - Professional and practical skills:

On successful completion of the course, the student should be able to:
c1- Choose suitable techniques to analyse some sociological issues.(C1, C2, C3)
c2- Calculate and evaluate the impact of industry on economy and national gross income. (C1, C5).
c3- Use suitable computer software for evaluating the effects of industrializing the society and predicting the future of industry (C5, C6, C7)).
C4- Prepare a report including the results and predictions (C12)

d - General and transferable skills:

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A5, A9, A11, A14, A17, A19
B	Intellectual skills	B1, B2, B9, B10, B13, B14, B16
C	Professional and practical skills	C1, C2, C3, C5, C6, C7, C12
D	General and transferable skills	D1, D3, D4, D7, D9

3- Contents

Topic	Lecture hours
➢ Introduction • History of industry. • Industrial activities.	5
➢ Economic Impact of industry • Economic changes in society.	5
➢ Planning of industry	5
➢ Contribution of industry in gross national product	5
➢ Society variation by industry	5
➢ Future of industry	5
Total hours	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments					Researches and	Modeling and			Written Exam	Practical Exam	Quizzes	Term papers	Assignments			
Knowledge & Understandin	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				
	a4	1			1							1				1			1	1			
Intellectual Skills	b1		1		1							1				1		1		1			
	b2	1	1	1	1							1				1			1	1			
	b3	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			
	c4		1		1	1													1	1			
General Tran. Skills	d1			1		1						1							1				
	d2		1									1							1				
	d3		1									1							1	1			
	d4	1	1	1								1											
	d5	1	1									1							1	1			

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: Lecture notes

6-2 Required books

Adel-ElHwary, " Sociology of Industry", Alfalah- Cairo, 2008

Mohamed Toheel, "Social Science and Politics", Alfarah-Cairo-2008

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc.

None

7- Facilities required for teaching and learning:

- Computer, Data show.

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

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF561 : 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: September 2015

B - BASIC INFORMATION

Title : Project-2a **Code:** MNF561 **Year/level:** Senior 2 ,9th semester
Credit Hours: 2 **Lectures:**1 **Tutorial:** **Practical:3**
Pre-requisite: None

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	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
• The project requires the following steps to be carried out: ✓ 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.	15		90
Total hours	**15**		**90**

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)
Evaluation of the Project	12th week	100
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:	Dr. Abdelmagid A. Abdalla
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF562: 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 2015

B - Basic Information

Title: Industrial training (2) **Code:** MNF 562 **Year/level:** Senior 2,10th semester
Credit Hours: **Lectures:** 1 **Tutorial:** -
Practical: 4 **Total:** 3
Pre-requisite: None

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
• Practical industrial training for six weeks- during the 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: ✓ 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)	6		24
Total hours	**6**		**24**

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)
Report from student of the training	By the end of the training period	10010
Total		1000

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:	Dr. Abdelmagid A. Abdalla
Date:	September 2015

Modern Academy for Engineering and Technology in Maadi

Course Specification
MNF563 : 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: September 2015

B - BASIC INFORMATION

Title : Project-2b **Code:** MNF563 **Year/level:** Senior 2 ,10th semester
Credit Hours: 4 **Lectures:**2 **Tutorial:** **Practical:**6
Pre-requisite: None

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	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
• The project requires the following steps to be carried out: ✓ 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.	15		90
Total hours	**15**		**90**

4 – Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods										Learning Methods				Assessment Method							
		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	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)
Evaluation of the Project	12th week	100
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: Dr. Abdelmagid A. Abdalla
Date: September 2015

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Appendix 3

شروط النجاح والتخرج وقواعد حساب التقدير

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الآتى بعد مستخرج من الشق القانونى للائحة الأكاديمية الحديثة للهندسة والتكنولوجيا بالمعادى للدراسة بالساعات المعتمدة (لائحة ٢٠١٢)

الباب الثاني
نظام الدراسة

مادة [٢]

يمنح وزير التعليم العالي بناءً على طلب مجلس إدارة الأكاديمية درجة بكالوريوس الهندسة والتكنولوجيا في أحد التخصصات التالية:-

[١] الهندسة الكهربية:

أ ـ هندسة الالكترونيات وتكنولوجيا الاتصالات .

ب ـ هندسة الحاسبات وتكنولوجيا المعلومات.

[٢] الهندسة الميكانيكية:

ـ هندسة التصنيع وتكنولوجيا الإنتاج .

[٣] الهندسة المعمارية:

ـ هندسة العمارة وتكنولوجيا البناء

وتتم الدراسة في هذه التخصصات حالياً بنظام الدراسة الفصلية. ، ويتم التحول للدراسة في هذه البرامج بنظام الساعات المعتمدة اعتباراً من العام الدراسي ٢٠١٢-٢٠١٣. ويسمح لمن يرغب من الطلاب بالتحويل من نظام الدراسة الفصلية إلى نظام الدراسة بالساعات المعتمدة بمقاصة لمن يرغب من الطلاب بحيث لا تقل عدد الساعات المعتمدة التي على الطالب أن يسجل فيها عن ٥٠% من مجموع الساعات المعتمدة للبرنامج ككل (لا تقل عن ٩٠ ساعة معتمدة)، على أن تستمر الدراسة بنظام الدراسة الفصلية للطلاب المقيدين بالأكاديمية قبل عام ٢٠١٢-٢٠١٣ ممن لم يحولوا للدراسة بنظام الساعات المعتمدة وذلك حتى تخرجهم.

مادة [٣]

تُمنح درجة البكالوريوس في الهندسة والتكنولوجيا للطلبة الذين يجتازون بنجاح دراسة مقررات بإجمالي ١٨٠ ساعة معتمدة، مع الحصول على المعدل التراكمي المطلوب للتخرج.

مادة [٤] : مدة الدراسة بنظام الساعات المعتمدة

- مدة الدراسة لنيل درجة البكالوريوس خمس سنوات موزعة على ١٠ فصول دراسية رئيسية ويمكن للطالب إنهاء متطلبات الدراسة قبل ذلك بفصل واحد على الأكثر.
- الحد الأقصى للدراسة ١٦ فصلا دراسيا ويفصل الطالب بعدها ويجوز إعادة قيده بموافقة مجلس الأكاديمية.

مادة [٥] : متطلبات الدراسة في برنامج الساعات المعتمدة

طبقاً لما ورد في الإطار المرجعي للوائح المعاهد الصناعية والهندسية التي تعمل بنظام الساعات المعتمدة فإن الجدول رقم (١) يبين نسب المقررات الإنسانية، و المقررات الأساسية، و المقررات الهندسية الأساسية، و المقررات الهندسية التخصصية، لكل من برامج بكالوريوس الحاسبات والاتصالات والعمارة والتصنيع و المدنى وقد روعي في اختيار نسب المقررات للبرامج توافقها مع متطلبات المجلس الأعلى للجامعات الموضحة بالجدول.

جدول رقم (١)

البيان (ساعات معتمدة)		برنامج اتصالات	برنامج حاسبات	برنامج عمارة	برنامج تصنيع
المواد الإنسانية (8-10%)	مواد إجبارية	١٢	١٢	١٤	١١
	مواد اختيارية	٤	٤	٤	٦
	النسبة المئوية الكلية	%٨,٩	٨,٩%	%١٠	%٩,٤
المواد الأساسية (15-20%)	مواد إجبارية	٣٦	٣٦	٢٨	٣٢
	مواد اختيارية	-	-	-	-
	النسبة المئوية الكلية	%٢٠	%٢٠	%١٥,٦	%١٧,٨
المواد الهندسية الأساسية (30-35%)	مواد إجبارية	٦٣	٦٣	٦٠	٥٤
	مواد اختيارية	-	-	-	٣
	النسبة المئوية الكلية	%٣٥	%٣٥	%٣٣,٣	%٣١,٧
المواد الهندسية التخصصية (35-40%)	مواد إجبارية	٥٠	٥٠	٦٠	٦٥
	مواد اختيارية	١٥	١٥	١٤	٩
	النسبة المئوية الكلية	%٣٦,١	%٣٦,١	%٤١,١	%٤١,١

مادة [٦]
يقوم طلبة المستوى الخامس بإعداد مشروع البكالوريوس الذى يحدد موضوعه مجالس الأقسام المختصة، وتخصص له فترة إضافية بعد الامتحان التحريري يحددها مجلس الأكاديمية بناء على اقتراح مجالس الأقسام المختصة، ويجوز أن يكون المشروع مقسماً على فصلين دراسيين متتاليين، ويراعى في اختيار الأقسام للمشاريع أن تكون ذات طبيعة تطبيقية أو نظرية أو خليطاً بينهما نابعة من الاحتياجات العملية وطبيعة الدراسة بكل قسم، ولا يتخرج الطالب إلا بعد أن يستوفي شروط النجاح في المشروع.

مادة [٧] : التدريب العملي

أولاً: تشمل الدراسة نظاماً للتدريب العملي لطلاب الأكاديمية في الأجازة الصيفية عقب أداء امتحانات آخر العام الدراسي بفترة قصيرة، على ألا يتعارض مع انتظام دراسة الطالب خلال الفصول الصيفية، وينقسم التدريب العملي إلى مرحلتين:

(أ) مرحلة التدريب الصيفي لطلبة المستوى الأول والثاني: هذا التدريب غير مقيم بساعات معتمدة، ولكن أداؤه إلزامي للتسجيل بالمستوى التالي، وفى حالة الظروف القهرية، يُفوض مجلس الأكاديمية فى السماح بأدائه في وقت لاحق.

(ب) مرحلة التدريب التخصصي لطلبة المستوى الثالث والرابع، ويقيم كل تدريب بثلاثة ساعات معتمدة، وتضاف نتيجة كل تدريب إلى تقييم الفصلين الأول والثاني من المستوى الخامس على التوالي.

ويتم التدريب بالتفاصيل الآتية:-

أ- التدريب الصيفي

(١) طلاب المستوى الأول

يتم هذا التدريب داخل صالات الرسم ومعامل الأكاديمية أو خارجها، ويشمل هذا التدريب الموضوعات العامة اللازمة للبناء المعرفى للمهندس، ويشتمل التدريب على الحاسبات والرسم الهندسي والاجهزة الكهربية والالكترونية والرسم المعمارى ومقدمة لاستخدام برامج الحاسب الآلى وأى موضوعات اخرى يقرها مجلس الاكاديمية. ويقسم الطلاب إلى مجموعات بحد أقصى ٢٥ طالب في المجموعة، ويتولى الإشراف على كل مجموعة عضو هيئة تدريس، واثنين من أعضاء الهيئة المعاونة، واثنين من الفنيين، بالإضافة إلى مشرف إداري، ويتم التدريب لفترة أربعة أسابيع خلال فصل الصيف.

(٢) طلاب المستوى الثاني

يتم التدريب داخل الأكاديمية أو خارجها ، لتدريب الطلاب فى مجالات الدراسة التى يقترحها القسم ويقرها مجلس الاكاديمية ، ويقسم الطلبة إلى مجموعات بحد أقصى ٢٠ طالب في كل مجموعة، ويشرف على كل مجموعة عضو هيئة تدريس، ومعيد أو مهندس، وفني مرافق للمجموعة، بالإضافة إلى مشرف إداري على المجموعة، ويتم التدريب لفترة أربعة أسابيع خلال فصل الصيف.

ب – التدريب الصناعي التخصصي التطبيقى

(١) طلاب المستوى الثالث

يتم تدريب الطلبة بمواقع الإنتاج والتنفيذ بالمؤسسات والمصانع والشركات، التي تعمل في التخصص الذي يدرس به الطالب تحت إشراف أعضاء هيئة التدريس ومعاونيهم والفنيين ورجال الصناعة.

يعين لكل مجموعة من الطلاب أحد أعضاء هيئة التدريس، يفضل أن يكون هو المشرف الأكاديمي لمتابعة الطالب في التدريب وتلقي التقارير التي تفيد مدى تقدم الطالب في التدريب من الطالب نفسه ومن الجهة القائمة بالتدريب، وعقب انتهاء التدريب يقوم كل قسم بتشكيل لجنة من أعضاء هيئة التدريس لمناقشة الطالب في التدريب الذي قام به وإعطاؤه تقديره المناسب طبقا لما هو وارد بالجدول رقم (٢).

ومدة التدريب من أربعة إلى ستة أسابيع حسب الخطة التى توضع لهذا التدريب. ويمكن إجراء التدريب بمعامل الأكاديمية التخصصية، بناءً على توصية المرشد الأكاديمي ومجلس القسم وتصديق عميد الأكاديمية.و تضاف النقاط التي حصل عليها الطالب في هذا التدريب إلى النقاط التي حصل عليها في الفصل الدراسي الأول من المستوى الخامس.

(٢) طلاب المستوى الرابع

يتم التدريب بنفس الكيفية التي يتم بها تدريب المستوى الثالث على أن يضاف تقدير هذا التدريب إلى نتيجة الفصل الدراسي الثاني للمستوى الخامس. ويتم التدريب في مؤسسة غير التي أتم فيها تدريب المستوى الثالث إلا إذا استدعى الأمر استكمال التدريب في نفس المؤسسة، ويكون ذلك بناء على توصية المرشد الأكاديمي، وموافقة مجلس القسم. ويمكن تأدية هذا التدريب كذلك بمعامل الأكاديمية التخصصية بناءً على توصية المرشد الأكاديمي ومجلس القسم وتصديق عميد الأكاديمية.

ثانياً: (أ) الإشراف العام على التدريب:

يحدد مجلس الأكاديمية منسقا من كل قسم لتنسيق العمل مع قسم التدريب فى أول كل عام دراسى.

(ب) التمويل

١- يسدد كل طالب مبلغ ٥٠٠ جنيه عن كل سنة في مرحلة التدريب الصيفي (المستوى الأول والثاني) ويجوز زيادة هذا المبلغ طبقا لدراسة التكلفة الفعلية للتدريب بعد تصديق رئيس الإدارة المركزية المختص بوزارة التعليم العالى.

٢- يسدد كل طالب ما قيمته ثلاثة ساعات معتمدة عن كل مستوى في مرحلة التدريب الصيفى التخصصي لتغطية تكاليف التدريب(المستوى الثالث والرابع).

٣- توضع حصيلة التدريب في صندوق ذو طابع خاص (وحدة الورش والمعامل للتدريب) للصرف منه على أغراض التدريب، حسب اللوائح المنظمة للصندوق. ولمجلس إدارة وحدة الورش والمعامل للتدريب العملي أن يغير قيمة التدريب المالية طبقاً للظروف المحيطة.

٤- تقوم وحدة الورش والمعامل للتدريب العملى بسداد مستحقات المؤسسات القائمة بالتدريب، مضافاً إليها المصروفات الإدارية والمتابعة والإشراف والمناقشة من حصيلة الصندوق.

الباب الثالث
قبول الطلاب

مادة [٨]

يحدد وزير التعليم بعد اخذ رأى المجلس الأعلى لشئون المعاهد فى نهاية كل عام جامعى عدد الطلاب من ابناء جمهورية مصر العربية أو غيرهم الذين يقبلون فى الأكاديمية فى ضوء احتياجاته فى العام الجامعى التالى من الحاصلين على شهادة الثانوية العامة أو على الشهادات المعادلة ونظام قبولهم.

مادة [٩]

يكون ترشيح الطلاب للقبول بالأكاديمية عن طريق مكتب التنسيق ما لم يصدر قرار من وزارة التعليم بغير ذلك

مادة [١٠]

- يشترط في قيد الطالب في غير معاهد الدراسات العليا :

(١) أن يكون حاصلاً على شهادة الدراسة الثانوية العامة (علمى رياضة) أو ما يعادلها ويكون القبول بترتيب درجات النجاح ويقبل كذلك الحاصلون على دبلوم المدارس الثانوية الفنية فى بعض المعاهد ووفقاً للقواعد والشروط التي يحددها وزير التعليم.

(٢) أن يثبت الكشف الطبي خلوه من الأمراض المعدية وصلاحيته لمتابعة الدراسة وفقاً للقواعد التي يحددها المجلس الأعلى لشئون المعاهد.

(٣) أن يكون متفرغاً للدارسة بالأكاديمية وذلك وفقاً لأحكام اللوائح الداخلية للمعاهد.

(٤) أن يكون محمود السيرة حسن السمعة.

مادة [١١]

- يعطى كل طالب بطاقة شخصية خاصة تلصق عليها صورته ويوقعها عميد الأكاديمية وتختم بخاتم الأكاديمية ويجب تقديم هذه البطاقة في كل شأن دراسي ولا يسمح لأي طالب بحضور الدروس والمحاضرات والتمرينات العلمية وبتأدية الامتحانات إلا إذا كان يحمل بطاقته. على كل طالب مقيد بأحد المعاهد أن يثبت حضوره بالطريق الذي يحدده المعهد.

مادة [١٢]

- لا يجوز للطالب أن يقيد اسمه في أكثر من معهد في وقت واحد ولا يجوز له أن يجمع بين القيد في معهد غير تابع للوزارة أو أي كلية جامعية ولا يجوز إعادة قيد الطالب بأي معهد للحصول على شهادة سبق له الحصول عليها كما لا يجوز إعادة قيده للحصول على شهادة أخرى من معهد مماثل.

مادة [١٣] تحويل الطلاب ونقل قيدهم

تحويل ونقل قيد الطلاب إلى الأكاديمية لبدء الدراسة بالفصل الدراسى الثانى بقرار من الإدارة المركزية المختصة بوزارة التعليم العالى. وطبقاً لما ورد في نص المادة (٤١) من قانون ٥٢ لسنة ١٩٧٠ ولائحة المعاهد رقم (١٠٨٨) لسنة ١٩٨٧: تحويل ونقل قيد الطلاب فيما بين المعاهد وفق القواعد الآتية:

١) لا يجوز النظر في تحويل الطلاب المقيدين بالمستوى الأول بين المعاهد المتناظرة إلا إذا كان الطالب حاصلاً على الحد الأدنى للمجموع الذي وصل إليه القبول في المعهد المطلوب التحويل إليه، ويتم التحويل بموافقة مديري المعهدين.

٢) يجوز النظر في تحويل الطلاب المقيدين بمستوى أعلى من المستوى الأول بين المعاهد المتناظرة إذا وجدت ظروف اجتماعية أو صحية تقتضى التحويل وذلك بموافقة مديري المعهدين.

٣) يجوز نقل قيد الطالب المنقول إلى مستوى أعلى من المستوى الأول بأي من الكليات الجامعية أو من معهد إلى معهد غير مناظر بشرط أن يكون حاصلاً على الحد الأدنى لمجموع الدرجات الذي وصل إليه القبول في المعهد المطلوب النقل إليه سنة حصوله على الشهادة الثانوية أو المستوى الجاري أيهما أفضل للطالب وذلك بموافقة مديري المعهدين. وفي هذه الحالة يكون قيد الطالب فى اول مستوى للدراسة بالأكاديمية.

٤) يشترط في جميع الحالات السابقة ألا يكون الطالب المطلوب تحويله أو نقل قيده قد استنفذ فرص الرسوب، وألا يكون الطالب قد فصل لسبب تأديبي، وفى جميع الحالات يشترط تقديم طلب التحويل في المعهد المطلوب التحويل إليه قبل بدء الدراسة، ويجوز لمجلس إدارة الأكاديمية عند الضرورة القصوى قبول التحويل خلال الشهر التالي لبدء الدراسة، كما يشترط مراجعة وموافقة رئيس الإدارة المركزية المختصة.

٥) يجوز نقل قيد الطلاب المفصولين بغير الطريق التأديبي من الكليات العسكرية أو كلية الشرطة لعدم الصلاحية للحياة العسكرية وكذا المفصولين لإستنفاذ مرات الرسوب بالمعاهد التي مدة الدراسة بها أربع سنوات مستجدين بالمستوى

الأول بشرط أن يكون الطالب حاصلاً على المجموع الكلى والمواد المؤهلة، إن وجد، سنة حصوله على الثانوية العامة. وان يكون تقديم طلب الالتحاق فى السنة الدراسية التى فصل الطالب خلالها او فى السنة الدراسية اللاحقة بها على الأكثر إذا كان فصله قد تم بعد بدء الدراسة بالمعهد فى السنة السابقة على تقديمه بطلب الالتحاق.
وطبقاً لما ورد في نص المواد (٤٢،٤٤) من قانون ٥٢ لسنة ١٩٧٠ ولائحة المعاهد رقم (١٠٨٨) لسنة ١٩٨٧:

- يجوز أن يقبل بالأكاديمية الطلاب الذين استنفذوا مرات الرسوب في الكليات والمعاهد العالية وفقاً للقواعد الآتية:-
(أ) أن يكون الطالب مقيدا فى الكلية أو المعهد فى السنة الدراسية السابقة على السنة التى يلتحق فيها بالأكاديمية.
(ب) أن يكون حاصلاً في الشهادة الثانوية العامة (علمى رياضة) أو ما يعادلها على مجموع يؤهله للالتحاق بالأكاديمية في عام حصوله على تلك الشهادة أو في عام التحاقه بالأكاديمية أيهما أفضل للطالب.
ويكون التحاق هؤلاء الطلاب بالمستوى الأول مستجدين، وتقدم أوراق هؤلاء الطلاب إلى الاكاديمية لإرسالها للإدارة المختصة بالوزارة ويكون قبولهم بموافقة مجلس إدارة الاكاديمية .
- يجوز قيد وإعادة قيد الطالب في الحالات الآتية:-
١) الطالب المستجد الذي لم يستكمل إجراءات قيده لعذر مقبول.
٢) الطالب الذي سحب أوراقه وهو مقيد بالأكاديمية وقدم عذراً.
٣) الطالب الذي لم يتقدم لمكتب التنسيق في سنة حصوله على الثانوية العامة لعذر مقبول.
وفى جميع هذه الحالات يعتبر عام رسوب السنة التى تنقضى دون ان يقيد فيها الطالب نفسه ويكون القيد أو إعادة القيد وبقرار من رئيس الإدارة المركزية المختص أو بموافقة مجلس إدارة الأكاديمية على حسب الاحوال.
- يجوز لمجلس أدارة الأكاديمية أن يوقف قيد الطالب لمدة سنة دراسية ولا تزيد المدة عن سنتين أذا تقدم بعذر مقبول يمنعه من الانتظام فى الدراسة و يجوز لرئيس الإدارة المركزية مد هذه المدة بحد أقصى ضعف مدة الدراسة بالأكاديمية عند الضرورة القصوى.

الباب الرابع
الامتحانات

مادة (١٤)

- إذا فصل الطالب من الأكاديمية بسبب استنفاذ مرات الرسوب فى مقرر إجبارى أو أكثر يمكن بموافقة مجلس أدارة الأكاديمية أعادة قيده بالأكاديمية كطالب مكن الخارج مع حضور التمارين العملية ويكون أعادة القيد بحد أقصى ثلاثة فصول دراسية فيما رسب فيه الطالب.
- يسدد الطالب التكلفة الكاملة لدراسته فى المقررات المسجل فيها طبقاً لأخر حساب ختامى للأكاديمية بالإضافة إلى رسم إعادة قيد يحدده مجلس أدارة الأكاديمية على أن يتحول إلى طالب نظامى مرة أخرى بعد انتفاء سبب فصله من الأكاديمية.

مادة (١٥)

- يمكن للطالب الانقطاع عن الدراسة لمدة تزيد عن ثلاثة فصول دراسية بعذر مسبق يقبله مجلس إدارة الأكاديمية يواصل بعده الدراسة.
- أما إذا انقطع الطالب عن الدراسة لمدة أقصاها ثلاثة فصول دراسية بعذر مسبق يقبله مجلس إدارة الاكاديمية فيمكن له ان يواصل دراسته على ان تحسب له المقررات السابق له النجاح فيها بدرجة (جيد) على الاقل ويخضع تخرجه لأية متطلبات جديدة فى الفصل الذى اعيد قيده فيه بالإضافة لإعادته للمواد التى حصل فيها على تقدير مقبول على الأكثر.
- يفصل الطالب من الأكاديمية إذا انقطع الطالب عن الدراسة بدون عذر مسبق لفترة فصلين دراسيين أو إذا انقطع عن الدراسة لنفس هذه المدة رغم رفض مجلس إدارة الأكاديمية للعذر الذى تقدم به.
- أما إذا انقطع الطالب عن الدراسة لمدة تزيد عن سته فصول دراسية عادية بعذر مسبق يقبله مجلس إدارة الأكاديمية فيمكنه العودة للدراسة بالأكاديمية على ان يعامل معاملة الطالب المستجد ولا تحسب له اية نقاط عن المقررات التى سبق له النجاح فيها قبل انقطاعه.

مادة (١٦)

طبقا للمادة (٥٠) من القانون رقم (٥٢) لسنة ١٩٧٠ ولائحته التنفيذية الصادرة بقرار وزير التعليم العالى رقم ١٠٨٨ لسنة ١٩٨٧ بالنسبة للمعاهد العالية لخاصة فيكون عميد الأكاديمية هو الرئيس العام للامتحانات بالأكاديمية والوكيل المختص نائبا له وأن تشكل لجان العمل للامتحانات وفقا للقواعد المنظمة لذلك بالأكاديمية وعلى ان يعتمد هذا التشكيل من رئيس القطاع المختص.

مادة (١٧)

ترسل الاكاديمية الى الإدارة المختصة بوزارة التعليم العالى قبل بدء موعد الامتحان بشهر على الأقل كشوفا من ثلاث صور بأسماء الطلاب الذين سوف يتقدمون للامتحان سواء فى امتحان النقل أو الامتحان النهائى، وتقوم الإدارة المختصة بمراجعة هذه الكشوف للتأكد من صحة قيد الطلاب بالأكاديمية واحقيتهم فى تأدية الامتحان ويستبعد الطلاب الذين لا حق

لهم فى تأدية الامتحان ثم تعتمد هذه الكشوف وتحفظ صورة منها بالإدارة العامة لشئون الطلاب والامتحانات وترسل صورة للأكاديمية وتسلم الصورة الثالثة لرئيس عام الامتحان للعمل بمقتضاها فى امتحان نهاية العام الدراسى.

مادة (١٨)

تعلن نتيجة امتحان النقل بعد مراجعتها من الإدارة المختصة بوزارة التعليم العالى واعتمادها من مجلس إدارة الاكاديمية كما تعلن نتيجة امتحان البكالوريوس بعد مراجعتها من الإدارة المختصة واعتمادها من وزير التعليم ولا تعلن نتيجة الطلاب ولا يخلى طرفهم إلا بعد سداد جميع الرسوم والمصروفات المستحقة عليهم.

مادة (١٩)

- تقوم الأكاديمية بتحرير شهادات مؤقته لخريجى السنوات النهائية يوقعها عميد الأكاديمية موضحا بها (الاسم- تاريخ الميلاد – جهة الميلاد – دور التخرج- مشروع التخرج – التقدير العام). كما تقوم أيضا بتحرير (شهادات تقديرات النجاح فى كل مادة).
- كما تقوم الأكاديمية بتحرير الشهادات النهائية للخريجين محررا بها تاريخ منح المؤهل من تاريخ اعتماد وزير التعليم لنتيجة الامتحان وترسل الى وزارة التعليم العالى لمراجعتها واعتمادها من الأستاذ الدكتور الوزير.

الـبــاب الخامس

قواعد التدريس والقيد والتسجيل وتـقديرات النجاح

مادة [٢٠] : الأقسام العلمية المشاركة في تنفيذ برامج الساعات المعتمدة

يختص كل قســـم من أقســـام الأكاديمية بالتدريس وإجراء البحوث التى تخص مقرراته طبقا لبرامج الســـاعات المعتمدة وجداول النظام الكودي للمقررات الدراسية وتفاصيلها.

مادة [٢١] : المقررات العامة

يعهد مجلس الأكاديمية إلى قســـم أو أكثر بتدريس المقررات العامة ذات الكود (عام) تحت الإشـــراف المباشـــر لوكيل الأكاديمية.

مادة [٢٢] : شروط القيد

يتم القيد للدراسة بنظام الساعات المعتمدة اعتباراً من العام الدراسي ٢٠١٢-٢٠١٣ للطلبة الحاصلين على شهادة الثانوية العامة قسم رياضيات أو ما يعادلها، ممن تم توزيعهم عن طريق مكتب التنسيق أو المحولين من كليات أخرى طبقاً للشروط التي يضعها المجلس الأعلى للجامعات أو المحولين من نظام الدراسة الفصلية إلى نظام الدراسة بنظام الساعات المعتمدة من طلاب الأكاديمية، بحيث لا يتم نقل أكثر من ٥٠% من الساعات المعتمدة من إجمالي ما تم دراسته بالنظام الفصلي طبقاً لما ورد في المادة ٢٨ من قانون ٥٢ لسنة ١٩٧٠.

مادة [٢٣] : ساعات التدريس بنظام الساعات المعتمدة

(أ) ساعات المحاضرات: ١ ساعة محاضرة تساوي ١ ساعة معتمدة

(ب) ساعات التمـــارين : تمرين مدته ١ ساعة يساوي صفر
تمرين مدته من ٢ إلى ٣ ساعات يساوي ١ ساعة معتمدة

(ج) ساعات المعمل والتطبيقات العملية: ساعتين معمل أو تطبيقات تساوي ١ ساعة معتمدة

تتم الدراســة باللغة الانجليزية، وتضــع الأكاديمية نظاماً للتأكد من مســتوى الطالب في اللغة الانجليزية، ويســتثنى من ذلك بعض المقررات الإنسانية والهندسة المعمارية والمدنية، ويكون الامتحان بنفس اللغة التي يدرس بها المقرر.

مادة [٢٤] : مواعيد الدراسة والقيد

يقسم العام الدراسى بالأكاديمية إلى ثلاثة فصول دراسية على النحو التالي :

الفصل الدراسي الأول : يبدأ في بداية العام الدراسى فى شهر سبتمبر ولمدة ١٥ أسبوع دراسى.

الفصل الدراسي الثاني : يبدأ عقب إجازة منتصف العام ولمدة ١٥ أسبوع دراسى.

الفصـــل الصيفـــــــي : يبدأ خلال أسبوعين من نهاية امتحانات الفصل الدراسى الثانى ولمدة ٨ أسابيع دراسية.

ويتم القيد لأي مرحلة خلال الأسابيع الثلاثة السابقة لبدء الفصل الدراسي بشرط استيفاء شروط القيد ودفع الرسوم المقررة، ويشـترط للتسـجيل في أي مقرر ألا يقل عدد الطلبة الراغبين في التسـجيل عن عشـرة طلاب، ويمكن أن يقل هذا العدد في الحالات الاستثنائية بموافقة مجلس أدارة الأكاديمية.

مادة [٢٥] : شروط التسجيل للدراسة بنظام الساعات المعتمدة

- يتقدم الطالب لتسجيل المقررات كل فصل دراسي، وبحد أقصى ١٨ ساعة معتمدة، بشرط استيفاء شروط التسجيل في كل مقرر، وبعد استشـارة المرشد الأكاديمي، وفي المواعيد المحددة بتوقيتات التسـجيل، مادة ١٧ من قانون ٥٢ لسـنة ١٩٧٠، وقواعده التي تصدرها الأكاديمية سنوياً وتنشر في دليل الطالب، ولا يعتبر التسجيل نهائياً إلا بعد دفع رسوم الخدمة التعليمية المقررة لكل فصل دراسي.
- يتم تقسيم المقررات على المستويات التصـاعدية الخمس التالية الموضـحة تفصـيلا بخريطة المقررات. ويتم التسـجيل للمقررات طبقا لخريطة المقررات مع الالتزام بتسـجيل مقررات المسـتويات الأدنى واسـتكمال سـاعات التسـجيل من المستوى الأعلى.

١- المستوى الأول Freshman

٢-	المستوى الثانى	Sophomore
٣-	المستوى الثالث	Junior
٤-	المستوى الرابع	Senior 1
٥-	المستوى الخامس	Senior 2

- يمكن للطالب الذى يبلغ معدله التراكمى ٣,٣ أو أكثر، التسجيل فى أكثر من ١٨ ساعة معتمدة وبحد أقصى ٢١ ساعة معتمدة فى الفصل الدراسى التالى لحصوله على هذا المعدل ابتداء من المستوى الثانى.
- يمكن للطالب التسجيل فى الفصل الدراسى الصيفى فى مقررات لا تزيد ساعاتها المعتمدة عن ٦ ويكون تسجيل الطالب اختياريا فى هذا الفصل الدراسى للنجاح فى مقرر رسب فيه أو رفع درجاته فى مقررات سبق نجاحه فيها أو لدراسة مقرر واحد من المستوى التالى يشرط حصوله على معدل تراكمى ٣,٣ او أكثر فى الفصل الرئيسى السابق . ويجوز أن يتم التسجيل بحد أقصى ٩ ساعات معتمدة لدواعى التخرج أو اجتياز متطلبات التسجيل.
- عند التسجيل فى مقررات جديدة، يراعى نجاح الطالب فى المقررات المؤهلة طبقا للائحة الدراسية.
- لا يجوز للطالب أن يدرس مقرر ومتطلبه السابق فى نفس الفصل الدراسى إلا إذا كان تخرجه يتوقف على ذلك.
- الطالب المتأخر عن مواعيد التسجيل، لا يتم تسجيله في المقررات الدراسية إلا إذا كان هناك مكان له، وللأكاديمية أن تقرر رسوم تأخير يحددها مجلس إدارة الأكاديمية تتناسب مع مدة التأخير بحد أقصى ٢٥% من رسوم التسجيل.
- على الطالب تحقيق معدل تراكمى لا يقل عن (٢) فى اى وقت فإذا قل يتم إنذاره ولا يصرح له بالتسجيل فى الفصل التالى لأكثر من ١٢ ساعة معتمدة وعند التكرار لفصلين متتاليين بعد ذلك يتم فصله نهائيا.
- يسمح للطالب بإعادة التسجيل في أي مقرر رسب فيه، ويعيده دراسة وامتحاناً بعد دفع رسوم الخدمة التعليمية المقررة. وفي هذه الحالة يحسب تقديره فيه بحد أقصى ٢ (C) ولا يدخل تقدير الرسوب السابق في حساب المتوسط التراكمي.
- للطالب الحق في تحسين متوسطه التراكمي بإعادة التسجيل في مقرر أو أكثر يكون قد سبق حصوله فيه على تقدير أقل من (٢). ويحسب له التقدير الجديد لهذا المقرر، ويتم حساب المتوسط التراكمى طبقا للتقدير الأخير.
- يمكن تسجيل طلاب كمستمعين في بعض المقررات نظير رسوم تقررها الأكاديمية، فى حدود ٧٥% من رسوم التسجيل للطلاب النظاميين، لو كان هناك مكان لهم، وذلك بعد تسجيل الطلاب النظاميين، ولا يحق لهم دخول الامتحان أو الحصول على شهادة بالمقررات.

المراقبة الأكاديمية

- إذا حصل الطالب عند نهاية أى فصل دراسى رئيسى على معدل تراكمى أقل من (٢) يوضع تحت المراقبة الأكاديمية.
- أثناء وضع الطالب تحت المراقبة الأكاديمية لا يسمح له بالتسجيل فى مقررات تزيد عن ١٢ ساعة معتمدة فى الفصل الدراسى الرئيسى الواحد.
- يلتزم الطالب أثناء وضعه تحت المراقبة الأكاديمية بالاجتماع مع مرشده الأكاديمى كل أسبوعين على الأقل، ويقوم المرشد الأكاديمى بمتابعة التحصيل الدراسى للطالب مع أساتذته.

حالات عرض الطلاب على مجلس الأكاديمية للنظر فى فصلهم

- الطالب المستجد الذى لم يجتاز ٣٠ ساعة معتمدة على الأقل خلال العامين الدراسيين الأولين (أو أول أربعة فصول دراسية أساسية).
- الطالب المستجد الذى لا يتمكن من رفع متوسط نقاطه التراكمى إلى ١,٥ فى نهاية الفصل الدراسى الرئيسى الرابع من بدء التحاقه بالأكاديمية.
- الطالب الذى يقل متوسطه التراكمى عن (٢) فى سته فصول دراسية متصلة أو فى ثمانية فصول دراسية غير متتالية.
- الطالب الذى لا يتمكن من استكمال متطلبات التخرج خلال ١٦ فصل دراسى رئيسى، عدا الفصول التى يتم فيها إيقاف قيده بعذر يقبله مجلس الأكاديمية. ويجوز إعادة قيده بشرط أن يزيد عدد الساعات المعتمدة التي إجتازها بنجاح عند إعادة القيد على ١٣٥ ساعة معتمدة. وفى هذه الحالة يمكن لمجلس الأكاديمية أن يمنح هذا الطالب فرصا إضافية بحد أقصى أربعة فصول دراسية رئيسية.
- الطالب الذى ينقطع عن الدراسة فصلين دراسيين أساسيين متتاليين أو ثلاث فصول دراسية أساسية غير متتالية دون عذر تقبله الأكاديمية.

مادة [٢٦] : رسوم الدراسة

- وتظل قيمة الساعة المعتمدة كما هي لأي طالب من وقت التحاقه بالأكاديمية وحتى تخرجه. وتزاد قيمة الساعة المعتمدة سنوياً بنسبة ٥% من قيمتها في العام السابق وذلك لكل دفعة من الطلبة الجدد. ويجوز زيادة هذا المبلغ طبقا لدراسة التكلفة الفعلية للتعليم بعد تصديق رئيس الإدارة المركزية المختص بوزارة التعليم العالى.
- يسدد الطالب رسوم تسجيل لمقررات الفصل الدراسى الصيفى بزيادة ٢٥% عن رسوم التسجيل للفصول الرئيسية.

- أما بالنسبة للطلبة الوافدين من غير أبناء جمهورية مصر العربية، فيقومون بتسديد الرسوم الإضافية وقيمة رسوم الخدمة التعليمية بالعملة الأجنبية، حسب القيمة التي يحددها وزير التعليم العالي، بشرط أن تكون هذه العملة قابلة للتحويل، ويمكن للطلبة الوافدين تسديد رسوم الخدمة التعليمية بالعملة المحلية، وذلك بتصديق من رئيس مجلس إدارة الأكاديمية.
- يتم تحصيل رسوم الخدمة التعليمية كل فصل دراسي ويعد السداد شرطا لإتمام التسجيل.
- يتم حساب رسوم الخدمة التعليمية طبقاً لعدد الساعات المعتمدة التي يسجل فيها الطالب لكل من الفصل الدراسي الأول والفصل الدراسي الثاني، بحد أدنى ما يقابل رسوم خدمة تعليمية لعدد ١٢ ساعة معتمدة لكل فصل دراسى، إلا إذا كان عدد الساعات المعتمدة المتبقية للطالب للحصول على درجة البكالوريوس أقل من ذلك فتتم محاسبته على الساعات المعتمدة المتبقية فقط للدراسة. وتكون رسوم الخدمة التعليمية للفصل الصيفي طبقاً لعدد الساعات المعتمدة التي يسجل فيها الطالب.
- يتم تحصيل رسوم التسجيل المقررة للوزارة سنويا فى بداية كل عام دراسى.

مادة [٢٧] : متطلبات الحصول على درجة البكالوريوس بالساعات المعتمدة

يشترط لتخرج الطالب ما يلى:

- أن يجتاز الطالب عدداً من الساعات المعتمدة المقررة، ومقدارها ١٨٠ساعة معتمدة، وبمعدل تراكمى لا يقل عن (٢) متضمنة مشروع البكالوريوس طبقا للمادة [٦].
- أن يؤدى التدريب العملى طبقا لما ورد في المادة [٧].
- أن يجتاز بنجاح الرخصة الدولية لقيادة الحاسب الآلي **(ICDL)**.

مادة [٢٨] : المرشد الأكاديمي للدارسين بنظام الساعات المعتمدة

- يعين وكيل الأكاديمية لكل طالب، عند التحاقه بالدراسة، مرشداً أكاديمياً من بين أعضاء هيئة التدريس، يمكن أن يستمر معه حتى نهاية الدراسة.
- يلتزم المرشد الأكاديمي بمتابعة أداء الطالب، ومعاونته في اختيار المقررات كل فصل دراسي، ويمكن للمرشد الأكاديمي أن يطلب وضع الطالب تحت المراقبة الاكاديمية لفصل دراسي واحد، مع خفض عدد الساعات المسجل فيها طبقا لما ورد بالمادة]٢٤[.

مادة [٢٩] : شروط التعديل والإلغاء والانسحاب وإيقاف القيد

- يحق للطالب تغيير مقررات سجل فيها، بأخرى خلال أسبوعين من بدء الدراسة، ولا يسري ذلك على الفصل الصيفي.
- يحق للطالب الانسحاب من المقرر خلال ثمانية أسابيع على الأكثر من بداية الدراسة بالفصلين الأول والثاني وثلاثة أسابيع على الأكثر في الفصل الصيفي وفى هذه الحالة لا ترد له الرسوم.
- الطالب الذي يرغب في الانسحاب من فصل دراسي، لظروف المرض أو بعذر تقبله الأكاديمية، عليه التقدم بطلب لشئون الطلاب، ويحصل على موافقة مجلس الأكاديمية على الانسحاب، دون استرداد ما سبق سداده من رسوم، ويكون هذا الانسحاب قبل الامتحان النهائى لهذا الفصل بأسبوع واحد على الأقل. ويقوم بإعادة المقررات التي سجل فيها، في فصل دراسي لاحق دراسة وامتحاناً بعد سداد رسوم الخدمة التعليمية المقررة، ولا تحسب عليه كمرة رسوب.

مادة [٣٠] : تقديرات المقررات الدراسية

- تقدر نقاط كل مقرر على النحو الموضح بالجدول رقم (٢):

جدول رقم (٢)

النسبة المئوية المناظرة	التقدير المكافئ	عدد النقاط	التقدير
٩٥% وأعلى	ممتاز (+)	4.0	A+
٩٠% حتى أقل من ٩٥%	ممتاز	3.7	A
٨٥% حتى أقل من ٩٠%	ممتاز (-)	3.3	A-
٨٠% حتى أقل من ٨٥%	جيد جداً (+)	3.0	B+
٧٥% حتى أقل من ٨٠%	جيد جداً	2.7	B
٧٠% حتى أقل من ٧٥%	جيد (+)	2.3	C+
٦٥% حتى أقل من ٧٠%	جيد	2.0	C
٦٠% حتى أقل من ٦٥%	مقبول (+)	1.7	D+
٥٥% حتى أقل من ٦٠%	مقبول	1.3	D
٥٠% حتى أقل من ٥٥%	مقبول (-)	1.0	D-
أقل من ٥٠%	راسب	صفر	F

- يتم إنذار الطالب الذى يحصـــل على تقدير أقل من (٢) فى أى مقرر لإعادة دراســته لتحســين النتيجة إلى (٢) على الأقل.
- المقررات التي يسـجل فيها الطالب كمسـتمع، أو التي يطلب فيها النجاح فقط، أو لم يكملها لسـبب قبلته الأكاديمية، ولا تدخل في حساب متوسط النقاط، يرصد له أحد التقديرات التالية:

المدلول	التقدير	
مرضي	Satisfactory	S
غير مرضي	Unsatisfactory	U
انسحاب	Withdrew	W
مستمع	Audit	AU
راسب	Fail	F
ناجح	Pass	P

مادة [٣١] : حساب متوسط النقاط (GPA)

- لا يعتبر الطالب ناجحاً في أي مقرر إلا إذا حصل على تقدير D^- على الأقل.
- لا يحصل الطالب على البكالوريوس، إلا إذا حقق متوسط نقاط قدره (٢) على الأقل.
- تحسب نقاط كل مقرر على أنها عدد ساعاته المعتمدة مضروبة فى عدد النقاط التى حصل عليها الطالب، جدول رقم (٢).
- يحســب مجموع النقاط التي حصــل عليها الطالب في أي فصــل دراســي، على أنها مجموع نقاط كل المقررات التي درسها في هذا الفصل الدراسي.
- يحسب متوسط نقاط الطالب لأي فصل دراسي (المتوسط الفصلي GPA)، على أنه ناتج قسمة مجموع النقاط التي حصــل عليها الطالب في هذا الفصــل، على مجموع الســاعات المعتمدة لهذه المقررات. ويكون تقدير الطالب فى هذا الفصل وفقا للجدول رقم (٢).
- يحســـب متوســـط نقاط التخرج (بعد نجاحه في مجمل متطلبات التخرج)، على أنها ناتج قســـمة مجموع نقاط كل المقررات التي درسها الطالب على مجموع الساعات المعتمدة لهذه المقررات متضمنة المقررات التى أعادها الطالب (ســواء لســابق رســوبه فيها أو للتحســين وتحتســب نقاط هذه المقررات فى المرة الأخيرة فقط) ويكون تحديد التقدير التراكمى وفقا للجدول رقم (٢).

مثال : بفرض حصول الطالب في فصل دراسي على التقديرات الموضحة بالجدول رقم (٣):
بالرجوع إلى الجدول رقم (٢) يتم تحديد عدد النقاط للتقدير الذي حصــل عليه الطالب لكل مادة، وبضــرب عدد النقاط في عدد الساعات المعتمدة لكل مادة وجمع هذه النقاط، يتم احتساب إجمالي النقاط. وحاصل قسمة إجمالي النقاط على إجمالي عدد الساعات المعتمدة لكل المواد هو متوسط نقاط الفصل.

- تمنح مرتبة الشــرف للطالب الذى لا يقل المعدل التراكمى الفصــلى له عن **3.3** خلال جميع الفصــول الدراســية الرئيسية، على ألا يكون الطالب قد رسب فى أى مقرر خلال دراسته لمرحلة البكالوريوس.

جدول رقم (٣)

المادة	عدد الساعات المعتمدة	التقدير	النقاط	عدد النقاط المحتسبة
لغة انجليزية	٣	A+	٤	١٢
برمجة حاسب	٣	C	٢	٦
فيزياء	٣	B+	٣	٩
كيمياء	٣	A+	٤	١٢
إنتاج	٣	C	٢	٦
إجمالي عدد الساعات المعتمدة = ١٥ متوسط نقاط الفصل الدراسى **(GPA)** = ٤٥ ÷ ١٥ = ٣				إجمالي عدد النقاط = ٤٥

مادة [٣٢] : تعريف حالة الطالب الدارس بنظام الساعات المعتمدة
كلما أكمل الطالب ٢٠% من متطلبات التخرج اعتبر منتقلاً من مستوى إلى مستوى أعلى منه (المستويات من ١ إلى ٥)، ولا يتطلب ذلك تحديد نوعية أو مســـتوى المقررات التي أكملها الطالب، ويعتبر ذلك نوعاً من التعريف بموقع الطالب بالأكاديمية.

مادة [٣٣] : أسلوب تقييم الدارس بنظام الساعات المعتمدة

(أ) توضح التفاصيل الآتية بهذه اللائحة توزيع درجات كل مقرر بين: أعمال الفصل، امتحان عملي/شفوي، امتحان نصف الفصل، الامتحان التحريري النهائي.

(ب) يعقد لكل مقرر امتحان تحريري في نهاية الفصل الدراسي لا تقل درجته عن ٦٠% من مجموع درجات المقرر، وذلك بواقع ٦٠% للامتحان التحريرى للمواد ذات الشق العملي و ٢٠% أعمال السنة و٢٠% للامتحان العملي وبواقع ٧٠% للامتحان التحريري للمواد التى لا تتضمن شق عملى و٣٠% لأعمال السنة. مدة الامتحان ٣ ساعات لجميع المواد عدا المواد الإنسانية فتكون ساعتين فقط. يستثنى من ذلك مقررات تحددها اللائحة مثل مشروع التخرج والتدريب الصيفي والندوات والأبحاث، وبعض المواد التي تخص تخصص العمارة، وهي على وجه التحديد مواد التصميم المعماري، التصميمات التنفيذية، الإنشاء المعماري ومواد البناء، الظل والمنظور، تطبيقات حاسب آلى، تخطيط المدن والإسكان، التصميم العمراني والتدريب البصرى. حيث تشكل درجات التحريري ٤٠% من مجموع الدرجات و ٦٠% لأعمال السنة، ومدة امتحان مادتي التصميم المعماري والتصميمات التنفيذية هي ٧ ساعات، ومواد الانشاء المعمارى والظل والمنظور والتصميم العمرانى ٥ ساعات، مواد التخطيط والاسكان ٤ ساعات وباقي المواد ٣ ساعات.

(ج) يعقد لكل مقرر امتحان تحريري في منتصف الفصل الدراسي لا تقل درجته عن ١٠% من مجموع درجات المقرر باستثناء المقررات التي تحددها اللائحة مثل مشروع التخرج والتدريب الصيفي والندوات والأبحاث.

(د) يعد الطالب راسباً فى المقرر إذا حصل فيه على مجموع درجات أقل من ٥٠% (تقدير **F**)، أو لم يحضر الامتحان التحريري لحرمانه من الدخول، أو لم يحضر الامتحان بدون عذر تقبله الأكاديمية. وفى هذه الحالة له أن يعيده دراسة وامتحانا مرة أو مرات أخرى حتى ينجح فيه.

(ه) يجوز السماح للطالب بإعادة بعض المقررات التي نجح فيها من قبل أو إضافة مقررات جديدة له، بغرض رفع متوسط النقاط ليحقق متطلبات التخرج.

مادة [٣٤] : نسبة الحضور والحرمان من الامتحان والأعذار

(أ) الحد الأدنى لنسبة الحضور للمقرر (لا تقل عن ٧٥%) ليسمح للطالب بدخول الامتحان النهائي للمقرر. وفي حالة حرمانه من الامتحان يعتبر راسباً (يعطى درجة صفر في درجة الامتحان النهائي للمقرر). وفى حالة ثبوت أن التغيب كان بعذر مقبول يمكن عقد امتحان للطالب في هذا المقرر خلال ثلاثة أسابيع من بدء الفصل الدراسي التالي مباشرة، بعد سداد الرسوم المحددة.

(ب) إذا تقدم الطالب بعذر يقبله مجلس الأكاديمية عن عدم حضور الامتحان النهائي لأي مقرر قبل أو بعد يومين من إجراء الامتحان، يحتسب له تقدير "غير مكتمل" في هذا المقرر، بشرط أن يكون ناجحاً في أعمال السنة، وألا يكون قد تم حرمانه من دخول الامتحانات النهائية. وفي هذه الحالة يتاح للطالب الحاصل على تقدير "غير مكتمل" فرصة أداء الامتحان النهائي لهذا المقرر في الموعد الذي يحدده مجلس الأكاديمية.

(ج) يجب على الطلاب متابعة الدروس والاشتراك فى التمرينات العملية وأعمال الورش والتدريب أو قاعات البحث وفقا لأحكام اللائحة الداخلية ولمجلس الأكاديمية الحق فى حرمان الطالب من التقدم للامتحان كله أو فى بعض المواد إذا رأى أن مواظبته غير مرضية طبقا لأحكام اللائحة الداخلية. وفى هذه الحالة يعتبر الطالب راسبا فى المقررات التى حرم من التقدم للامتحان فيها.

مادة [٣٥] : التحويل إلى برامج الساعات المعتمدة

يضع مجلس الأكاديمية ضوابط وشروط التحويل إلى البرامج بنظام الساعات المعتمدة بحيث لا يتم نقل أكثر من ٥٠% من الساعات المعتمدة من إجمالي ما تم دراسته بالنظام الفصلي.

مادة [٣٦] : النظام الكودى للمقررات

يتم تحديد كود المقررات الدراسية طبقا للجدول رقم (٤)

مفتاح الكود L_1 L_2 L_3 N_1 N_2 N_3 (مثال: MEC101 Mechanics)

جدول رقم (٤)

مفتـــــــــاح الكـــــــود $L_1\ L_2\ L_3$ $N_1\ N_2\ N_3$	
١- $L_1\ L_2\ L_3$ ثلاثة حروف ترمز إلى القسم والتخصص المسئول عن تدريس المقرر	
ARC	قسم العمارة
CMP	قسم الحاسبات
ELC	قسم الاتصالات
MTH	تخصص الرياضيات قسم العلوم الأساسية
PHY	تخصص الفيزياء قسم العلوم الأساسية
MEC	تخصص الميكانيكا قسم العلوم الأساسية
CHE	تخصص الكيمياء قسم العلوم الأساسية
MNF	قسم هندسة التصنيع
GEN	تخصص المواد الإنسانية وتتبع وكيل الأكاديمية إشرافيا
٢- N_1 رقم يرمز إلى المستوى التي تدرس به المادة	
المستوى الأول	$N_1 = 1$
المستوى الثاني	$N_1 = 2$
المستوى الثالث	$N_1 = 3$
المستوى الرابع	$N_1 = 4$
المستوى الخامس	$N_1 = 5$
٣- N_2 رقم يرمز إلى نوعية المادة التي ينتمي إليها المقرر	
مادة أساسية أو مادة تحضيرية	$N_2 = 0$
مادة هندسية أساسية	$N_2 = 1$
مادة هندسية تخصصية إجبارية	$N_2 = 2$
مادة هندسية تخصصية اختيارية	$N_2 = 3$
مادة إنسانية إجبارية	$N_2 = 4$
مادة إنسانية اختيارية	$N_2 = 5$
المشروع والندوات والتدريب الصناعي	$N_2 = 6$
٤- N_3 رقم يرمز إلى مسلسل المقرر داخل التخصص	