Manufacturing Engineering and Production Technology
B.Sc. Program Specification

By-Law 2000

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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 فى النشاط والسلوك المرتبط بالعمليات الهندسية والنظم والمشاكل والفرص، والتاريخ، والمستقبل، والتأثيرات، والأخلاق والمردودات. كما أنها تنطوى على المعرفة، وطرق التفكير والتصرفات والقدرات. كما تساعد فى إعداد الأفراد لتقديم خيارات مدروسة فى إطار كونهم مستهلكين أو عمالا أو مواطنين وأعضاء فى المجتمع الدولى.وينبغى أن يحقق التعليم الهندسي التميز والتفوق فى التعليم العالى والدراسات العليا والبحوث، والخدمة العامة، وتطوير المعارف الهندسية. وهو يهدف الى تخريج مهندسين موهوبين، واسعى المعرفة على درجة عالية من الكفاءة، بالإضافة إلى إنتاج بحوث وتقنيات مفيدة وخلاقة من خلال التفوق والتميز الأكاديمي. علاوة على ذلك فإن التعليم الهندسى يهدف إلى تحفيز الطلاب وأعضاء هيئة التدريس على التعلم والنمو، كذلك تحقيق وتلبية احتياجات المجتمع قوميًّا وإقليميًّا ودوليًّا. كما يهدف أيضا إلى إعداد الطّلبة لمهنة منتجة ومفيدة فى 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 ويساعد المهندسون على تعريف وتحسين نمط الحياة بتوفير وسائل حياتية ذات أداء عالى 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 التى تسمح بمواجهة التحديات المستقبلية .حددت المعايير الأكاديمية المرجعية (ARS)، لبرنامج هندسة التصنيع وتكنولوجيا الإنتاج والصادرة من الهيئة القومية للاعتماد وجودة التعليم، يوليو ٢٠١٥، الإصدار الأول، مفاهيما شاملة تمثل التوقعات والطموحات العامة بخصوص معايير درجة البكالوريوس فى 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 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 الهندسة الميكانيكية 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
منسق البرنامج

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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: Mechanical Engineering Department
Coordinator: Dr. Abdelmagid Abdelatif.
Assistant Co-ordinator: Dr. Maher Khalifa
External Evaluators: Prof. Dr Tawfik Tawfik M. El-Midani, Professor of Production Engineering, Production Engineering and Mechanical Design Department, Faculty of Engineering, Mansoura University.
Academic Standard: The program adopts the Academic Reference Standards for the manufacturing engineering and production technology BSc engineering program (ARS) approved by the National Authority for Quality Assurance and Accreditation in Education, July 2015, first edition.
Program Started on: 2002-2003
Dates of program specifications approval: July 2015

1.2. Staff Members

The Manufacturing Engineering and Production Technology B.Sc.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. External Evaluator(s)

The program was evaluated by one external evaluator. His evaluation showed that the program specification agrees with the approved by the National Authority for Quality Assurance and Accreditation in Education, July, 2015, first edition.

2. Professional Information

2.1. Preamble

Engineers solve real-life problems. They find the best solution 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 program adopts the Academic Reference Standards for the manufacturing engineering and production technology BSc engineering program (ARS) approved by the National Authority for Quality Assurance and Accreditation in Education, July, 2015, first edition.

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

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 the fields of mechanical design, production and industrial engineering, nationally and regionally. The graduate 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, Production Technology and Industrial Engineering.

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:

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

8. Consider the impacts of engineering solutions on society & environment.
9. Demonstrate knowledge of contemporary engineering issues.
10. Display professional and ethical responsibilities; and contextual understanding
11. Engage in self- and life- long learning.
12. Work with mechanical design and manufacturing systems.
13. Use of mathematics and physical and engineering sciences and systems analysis tools in components and machines and produce design and manufacture.
14. 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.
15. Use the computer graphics for design, communication and visualization.
16. Use and/or develop computer software, necessary for the design, manufacturing and management of industrial systems and projects.
17. Analyze multi-disciplinary mechanical, electrical, thermal and hydraulic systems.
18. 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 Contents

The program duration is five years, 10 semesters. The following tables show the program courses, their teaching hours, marking and the subject area, according to the NARS engineering programs structure.

1st Year / 1st Semester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proi. & Practice	Discretionary
B101	English Language I	2	0	0	2	2	15	0	35	50	2						
B111	Mathematics I	4	2	0	6	3	30	0	70	100		6					
B131	Physics I	4	0	2	6	3	20	20	60	100		6					
B141	Chemistry	2	0	2	4	3	20	20	60	100		4					
B121	Mechanics I	2	1	0	3	3	30	0	70	100		3					
E111	Introduction to Computers I	2	0	2	4	3	20	20	60	100		4					
M160	Production Engineering - Workshop I	2	0	2	4	3	30	10	60	100			2			2	
M150	Engineering Drawing & Projection I	0	4	0	4	3	40	0	60	100			4				
	Total	**18**	**7**	**8**	**33**		**205**	**70**	**475**	**750**	**2**	**23**	**6**	**0**	**0**	**2**	**0**

1st Year/ 2nd Semester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proi. & Practice	Discretionary
B102	English Language II	2	0	0	2	2	15	0	35	50	2						
B112	Mathematics II	4	2	0	6	3	30	0	70	100		6					
B122	Mechanics II	2	1	0	3	3	30	0	70	100		3					
B132	Physics II	2	2	2	6	3	20	20	60	100		6					
B142	Descriptive Geometry	2	2	0	4	3	30	0	70	100		4					
E112	Introduction to Computers II	2	0	2	4	3	20	20	60	100		4					
M151	Engineering Drawing & Projection II	2	4	0	6	3	40	0	60	100			6				
M161	Production Engineering - Workshop II	2	0	2	4	3	30	10	60	100			2			2	
	Total	**18**	**11**	**6**	**35**		**215**	**50**	**485**	**750**	**2**	**23**	**8**	**0**	**0**	**2**	**0**

2nd Year/ 3rd Semester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
A060	Civil Engineering Technology	2	0	2	4	3	20	20	60	100			4				
B200	English Language III	2	0	0	2	2	15	0	35	50	2						
B211	Mathematics III	4	2	0	6	3	30	0	70	100		6					
E210	Computer Programming I	2	0	2	4	3	20	20	60	100					4		
M201	Fluid Mechanics	4	1	1	6	3	20	20	60	100			5			1	
M250	Engineering Skills I	0	4	0	4	3	30	0	70	100			4				
M251	Mechanics of Machines I	2	2	0	4	3	30	0	70	100			4				
M261	Strength of Materials	2	0	2	4	3	20	20	60	100			3			1	
Total		**18**	**9**	**7**	**34**		**195**	**60**	**495**	**750**	**2**	**6**	**20**	**0**	**4**	**2**	**0**

2nd Year/ 4th Semester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
B202	History of Science & Technology	2	0	0	2	2	15	0	35	50	2						
B212	Mathematics IV	4	2	0	6	3	30	0	70	100		6					
E213	Computer Programming II	2	0	2	4	3	20	20	60	100					4		
M222	Thermodynamics	4	1	1	6	3	20	20	60	100			5			1	
M252	Mechanics of Machines II	2	2	0	4	3	30	0	70	100			4				
M253	Engineering Skills II	0	4	0	4	4	30	0	70	100			4				
M262	Materials Technology I	2	1	1	4	3	20	20	60	100				3		1	
M271	Principles of Manufacturing	2	1	0	3	3	30	0	70	100				3			
Total		**18**	**11**	**4**	**33**		**195**	**60**	**495**	**750**	**2**	**6**	**13**	**6**	**4**	**2**	**0**

3rd Year/ 5thSemester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
B300	English Lang IV	2	0	0	2	2	15	0	35	50	2						
B311	Mathematics V	2	2	0	4	3	30	0	70	100		4					
E030	Electrical & Electronic Circuits	4	1	1	6	3	20	20	60	100			5			1	
M310a	Computer Applications I	0	0	2	2	3	20	20	60	100					2		
M331	Thermo-Fluid Machinery	4	1	1	6	3	30	20	100	150			6				
M351	Mechanics of Machines III	2	2	0	4	3	30	0	70	100				4			
M360	Industrial Psychology	2	0	0	2	2	15	0	35	50	2						
M363	Manufacturing Technology I	3	2	1	6	3	20	20	60	100				5		1	
Total		**19**	**8**	**5**	**32**		**180**	**80**	**490**	**750**	**4**	**4**	**11**	**9**	**2**	**2**	**0**

3rd Year/ 6thSemester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
E050	Electrical Power Systems	3	1	1	5	3	20	20	60	100				4		1	
M310b	Computer Applications II	0	0	4	4		40	60	0	100					3	1	
M312	Industrial Management	2	2	0	4	3	30	0	70	100	4						
M352	Measuring Instruments &Instrumentation	2	1	1	4	3	20	20	60	100				3		1	
M364	Manufacturing Technology II	3	1	1	5	3	20	20	60	100				4		1	
M371	Machine Design I	3	0	3	6	3	20	20	60	100				6			
M399	Project1	1	0	3	4		50	100	0	150					1	3	
Total		**14**	**5**	**13**	**32**		**200**	**240**	**310**	**750**	**4**	**0**	**0**	**17**	**4**	**7**	**0**

4th Year/ 7thSemester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
B411	Mathematics VI	3	2	0	5	3	30	0	70	100		5					
M454	Production Management	3	1	2	6	3	30	20	100	150	6						
M461	System Dynamics & Vibrations	3	2	1	6	3	30	20	100	150			4		1	1	
M471	Machine Design II	3	0	4	7	3	30	20	100	150				7			
M481	Manufacturing Technology III	4	2	2	8	3	30	20	100	150				6		2	
	Total	**16**	**7**	**9**	**32**		**150**	**80**	**470**	**700**	**6**	**5**	**4**	**13**	**1**	**3**	**0**

4th Year/ 8thSemester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
E051	Signal Processing	3	2	1	6	3	20	20	60	100			5			1	
M400	Summer Training	0	0	0	0		50	0	50	100							
M462	Materials Technology II	3	1	2	6	3	30	20	100	150				4		2	
M472	Computer Aided Design (CAD)	3	0	4	7	3	30	20	100	150				3	4		
M474	Machine Tool Design	4	2	0	6	3	50	0	100	150				6			
M482	Automatic Control	3	2	2	7	3	30	20	100	150			4		1	2	
	Total	**16**	**7**	**9**	**32**		**210**	**80**	**510**	**800**	**0**	**0**	**9**	**13**	**5**	**5**	**0**

5th Year/ 9thSemester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						Discretionary
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	
M552	Operations Research	2	2	0	4	3	30	0	70	100							4
M561	Engineering Economy	2	2	0	4	2	15	0	35	50	4						
M571	Computer Aided Manufacturing (CAM)	3	1	2	6	3	30	20	100	150				2	3	1	
M573	Automation	4	1	1	6	3	30	20	100	150							6
M578	Hydraulic Power Systems	3	2	2	7	3	30	20	100	150				4	1	2	
M580c	Elective I	2	2	0	4	2	15	0	35	50			3		1		
M598	Report	0	2	0	2	2	15	0	35	50	2						
	Total	**16**	**12**	**5**	**33**		**165**	**60**	**475**	**700**	**6**	**0**	**3**	**6**	**5**	**3**	**10**

5th Year/ 10thSemester

Code	Course Name	Teaching Hours				W. Exam Duration	Marking				Subject Area						Discretionary
		Lectures	Exercises	Practical	Total hours		Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	
B512	Laws and Regulations for Engineers	3	0	0	3	2	15	0	35	50	3						
B572	Pollution and Society	2	0	0	2	2	15	0	35	50	2						
M576	Computer Integrated Manufacturing (CIM)	2	2	2	6	3	30	20	100	150							6
M574	Quality Control	2	2	2	6	3	20	20	60	100							6
M580a	Elective II	2	2	0	4	3	30	0	70	100				2	2		
M581	Advanced Manufacturing Processes	3	1	2	6	3	30	20	100	150				3	2	1	
M599	Project 2	0	0	4	4		100	100		200					1	3	
	Total	**14**	**7**	**10**	**31**		**240**	**160**	**400**	**800**	**5**	**0**	**0**	**5**	**5**	**4**	**12**

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Total teaching hours and subjects distribution over the subject areas

Semester	Teaching Hours				Marking				Subject Area						
	Lectures	Exercises	Practical	Total hours	Year work	Practical Exam	Written Exam	Total	Hum. & Soc. Sc.	Math. & B. Sc.	B. Eng. Sc.	App. Eng. & Des.	Comp. App. & ICT	Proj. & Practice	Discretionary
Total 1st Year/ 1st	18	7	8	33	205	70	475	750	2	23	6	0	0	2	0
Total 1st Year/ 2nd	18	11	6	35	215	50	485	750	2	23	8	0	0	2	0
Total 2nd Year/ 1st	18	9	7	34	195	60	495	750	2	6	20	0	4	2	0
Total 2nd Year/ 2nd	18	11	4	33	195	60	495	750	2	6	13	6	4	2	0
Total 3rd Year/ 1st	19	8	5	32	180	80	490	750	4	4	11	9	2	2	0
Total 3rd Year/ 2nd	14	5	13	32	200	240	310	750	4	0	0	17	4	7	0
Total 4th Year/ 1st	16	7	9	32	150	80	470	700	6	5	4	13	1	3	0
Total 4th Year/ 2nd	16	7	9	32	210	50	510	800	0	0	9	13	5	5	0
Total 5th Year/ 1st	16	12	5	33	165	60	475	700	6	0	3	6	5	3	10
Total 5th Year/ 2nd	14	7	10	31	240	160	400	800	5	0	0	5	5	4	12
Total of Five Years	167	84	76	327	1955	910	4605	7500	33	67	74	69	30	32	22
% of Five Years									10.0917	20.4893	22.63	21.1009	9.17431	9.78593	6.72783
% NARS									9-12 %	20-26 %	20-23 %	20-22 %	9-11 %	8-10 %	6-8 %

The previous table shows that the program structure agrees with the NARS engineering programs structure. Moreover it is approved by the Engineering sector committee of the supreme council of universities.

2.5. Curriculum Mapping

Appendix 1 is dedicated to the curriculum mapping. It aims at insuring that the program courses cover the program ILO's. The courses coordinators prepared a table indicating the program ILO's covered by their courses and the courses subject areas hours. These tables were used to develop the mapping matrix Program courses/program ILO's.

The mapping matrix showed that the program courses present balanced contribution to the program ILO's which proves the correct adoption of the Academic Reference Standard for the manufacturing engineering and production technology BSc engineering program (ARS) approved by the National Authority for Quality Assurance and Accreditation in Education, July, 2015, first edition.

Two additional tables were added to Appendix 1, summarizing the program ILO's contributed by the individual courses and the courses contributing to the individual ILO's.

2.6. Courses Specifications

The detailed program courses specifications are given in **Appendix 2.**These courses specifications were revised and approved on September 2015 The contribution of each course to the program ILO's were considered during this revision.

3. Program Admission Requirements

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

4. Regulations for Progression and Program Completion

➤ Attendance of program is on full-time basis.

➤ A student may be transferred to a following academic year if she/he passes all attended courses but a maximum of two in accumulation – excluding humanity or cultural courses

➤ The humanity and cultural courses are not counted as non-passing courses, but have to be completed before graduation.

➤ The study follows the semester system with two semesters per year, 15 weeks each.

➤ The minimum time for the Bachelor degree is five academic years.

➤ A minimum of 75 % student attendance to lectures, tutorials and laboratory exercises per course is conditional for taking the final exams, in accordance with the Departmental Board recommendation approved by the Academy Council; otherwise students would be deprived from taking their final exam(s).

➤ The student is entitled to re-set failed exam(s) with fellow-students undertaking the course(s) in following term(s).

➤ Final-year students who fail no more than two courses plus any number of humanity cultural courses are re-examined in November.

➤ If they fail re-set(s), they are entitled to be re-examined with fellow-students undertaking the course(s) in following term(s).

➤ Except for those in final-year, students who provide evidence of successfully completing particular courses in parallel academic institutions, which are recognized by the Ministry of Higher Education, may be exempted from attending these courses. This may only take place after a decision from the Academy Chairman, following the Education & Student Affairs Council and the Faculty and Departmental Boards approval respectively; with no desecration of Article (36) of University Regulation Law.

➤ The course which is taught in one semester and has one examination mark and more than examination answer sheets, is treated as one-course as regards the course evaluation.

➤ 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 year.

➤ No mark is recorded for the student who fails to appear in the written examination.

Appendix 3 gives the details of program progression and grades evaluation.

5. Teaching and Learning Methods

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

- Brain storming
- Projects
- Modeling and Simulation
- Laboratory Experiment

Learning methods
- Site visits
- Self-learning
- Cooperative
- Discovering

6. Student Assessment

- Written exam
- Quizzes and reports
- Oral exams
- Practical
- Project applied on a practical field problems
- Other assessment methods

7. Program Evaluation

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

Appendix 1
Curriculum Mapping

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Curriculum Mapping Matrices

Appendix 2.1, Table-1a, Curriculum Mapping Matrix (A's)

Code	Subject	knowledge and understanding (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
B101	English Language I									1	1														
B111	Mathematics I	1	1			1																			
B121	Mechanics I	1		1	1																				
B131	Physics I	1	1	1	1																				
B141	Chemistry	1		1	1	1	1		1			1	1												
E111	Introd. To Computer I				1			1					1	1	1				1						
M150	Eng. Drawing I	1	1		1	1																			
M160	Production Eng. I	1	1		1																				
B102	English Language II									1	1														
B112	Mathematics II	1		1		1																			
B122	Mechanics II	1		1	1																				
B132	Physics II	1		1		1																			
B142	Descriptive Geometry	1			1																				
E112	Introd. To Computer II		1		1			1								1		1	1						
M151	Eng. Drawing II	1	1		1																				
M161	Production Eng. II	1	1		1																				
A060	Civil Eng. Technology			1	1			1	1																
B200	English Language III									1	1														
B211	Mathematics III	1					1																		
E211	Computer Prog. I	1	1		1	1								1		1	1		1						
M201	Fluid Mechanics	1	1	1	1	1								1	1				1	1					
M250	Engineering Skills I		1	1	1	1	1												1						
M251	Mechanics of Mach. I	1			1																				
M261	Strength of Materials			1	1	1						1		1					1						
B202	History of Sci. & Tech.	1				1			1	1		1			1										
B212	Mathematics IV	1	1			1																			
E213	Computer Prog. II	1	1		1									1		1	1		1						
M222	Thermodynamics	1	1	1	1	1			1				1	1					1						
M252	Mechanics of Mach. II	1			1	1							1	1					1						
M253	Engineering Skills II		1			1	1												1	1					
M262	Material Technology I		1	1	1														1						1
M271	Principles of Manuf.	1		1	1	1			1					1		1			1						
B300	English Language IV									1	1														
B311	Mathematics V	1		1		1																			
E030	Elect&Electronic Eng.	1			1	1			1					1	1	1									
M310a	Comp. Applications I		1	1	1		1					1		1					1				1		
M331	Thermo-Fluid Machinery	1	1	1	1	1								1	1				1						
M351	Mechanics of Mach. III	1			1	1								1	1				1						
M360	Industrial Psychology									1		1													
M363	Manufacturing Tech I	1		1					1						1										
E050	Elect. Mach & Power Sys.	1		1		1			1				1		1		1		1						
M310b	Comp. Applications II	1	1						1					1								1	1		
M312	Industrial Management	1						1													1				
M352	Measuring Instruments			1	1										1										
M364	Manufacturing Tech II	1	1	1		1	1		1				1	1					1				1		
M371	Machine Design I		1	1	1														1						
M399	Project I	1		1					1		1		1	1	1	1	1	1	1	1	1	1	1		
M400	Summer Training																1				1				
B411	Mathematics VI	1				1																			
M454	Production Management							1														1			
M461	System Dynamics	1				1							1	1	1		1	1		1		1			
M471	Machine Design II		1	1	1														1						
M481	Manufacture Tech. III	1		1	1									1		1				1		1	1		1
E051	Signal Processing	1	1	1		1			1					1			1		1						1
M462	Material Technology II			1					1					1	1							1			1
M472	C A D	1	1		1				1				1	1	1	1		1	1			1			
M474	Machine Tool Design	1			1									1	1					1					
M482	Automatic Control	1		1	1	1										1									
M552	Operations Research	1			1											1									
M561	Engineering Economy	1	1			1		1																	
M571	C A M				1									1		1					1	1	1		
M573	Automation			1					1			1		1		1									
M578	Hydraulic Power Syst.	1	1	1	1	1			1																
M580c	Prod Planning & Control			1		1	1	1		1				1	1						1	1	1		
M598	Report									1	1														
B512	Laws & Regul for Eng.						1	1		1	1	1													
B572	Pollution & Society									1	1														
M576	C I M	1	1	1					1					1					1		1		1		1
M580a	Modeling & Simulation	1		1		1			1							1		1	1						
M574	Quality Control	1			1	1	1					1										1	1		1
M581	Advanced Manuf. Proc.								1			1		1	1	1									
M599	Project II	1		1					1		1		1	1	1	1	1	1	1	1	1	1			

Appendix 2.1, Table-1b, Curriculum Mapping Matrix (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
B101	English Language I				1																		
B111	Mathematics I	1	1	1				1															
B121	Mechanics I	1	1	1	1							1											
B131	Physics I	1	1	1				1				1											
B141	Chemistry	1	1	1	1		1		1		1		1										
E111	Introd. To Computer I	1	1	1			1					1	1	1									
M150	Eng. Drawing I		1	1	1				1														
M160	Production Eng. I		1	1					1		1												
B102	English Language II				1																		
B112	Mathematics II	1	1	1	1			1				1											
B122	Mechanics II	1	1	1								1			1								
B132	Physics II		1	1	1	1																	
B142	Descriptive Geometry			1	1																		
E112	Introd. To Computer II	1	1									1	1										
M151	Eng. Drawing II			1					1	1													
M161	Production Eng. II		1	1							1												
A060	Civil Eng. Technology	1	1							1													
B200	English Language III				1																		
B211	Mathematics III	1	1					1															
E211	Computer Prog. I	1	1	1			1		1					1	1		1	1					
M201	Fluid Mechanics	1	1					1						1				1					
M250	Engineering Skills I			1	1				1						1								
M251	Mechanics of Mach. I	1	1											1									
M261	Strength of Materials				1	1	1	1						1	1			1					
B202	History of Sci. & Tech.	1	1				1	1															
B212	Mathematics IV	1	1	1				1															
E213	Computer Prog. II	1	1	1			1										1	1					
M222	Thermodynamics	1	1	1		1								1				1					
M252	Mechanics of Mach. II		1	1								1	1	1		1		1					
M253	Engineering Skills II			1	1				1									1					
M262	Material Technology I		1											1	1		1			1			
M271	Principles of Manuf.	1	1		1			1		1									1				
B300	English Language IV				1																		
B311	Mathematics V	1	1	1	1			1															
E030	Elect&Electronic Eng.	1	1	1	1			1															
M310a	Comp. Applications I			1	1				1									1					1
M331	Thermo-Fluid Machinery	1	1	1		1	1			1													
M351	Mechanics of Mach. III			1	1									1	1		1		1				
M360	Industrial Psychology				1					1													
M363	Manufacturing Tech I	1	1											1					1				1
E050	Elect. Mach & Power Sys.		1	1			1			1		1											
M310b	Comp. Applications II	1	1		1								1	1				1					1
M312	Industrial Management	1						1	1														
M352	Measuring Instruments					1				1				1	1			1					
M364	Manufacturing Tech II	1	1		1			1											1				
M371	Machine Design I		1			1	1							1									
M399	Project I				1									1	1		1		1			1	
M400	Summer Training				1						1												
B411	Mathematics VI	1	1	1								1											
M454	Production Management								1	1													
M461	System Dynamics	1		1				1					1	1				1			1		1
M471	Machine Design II		1			1	1							1									
M481	Manufacture Tech. III															1							
E051	Signal Processing	1	1		1	1		1					1	1			1	1					
M462	Material Technology II		1	1				1						1					1	1	1		1
M472	C A D	1	1			1			1			1		1			1				1		
M474	Machine Tool Design	1	1		1					1				1									
M482	Automatic Control	1				1								1		1							
M552	Operations Research	1	1	1		1		1				1											
M561	Engineering Economy	1	1					1	1														
M571	C A M	1									1		1	1				1					
M573	Automation				1				1					1	1		1						
M578	Hydraulic Power Syst.	1	1			1				1				1	1	1							
M580c	Prod Planning & Control		1	1	1	1		1		1	1	1					1	1					
M598	Report				1				1		1												
B512	Laws & Regul for Eng.			1	1					1			1										
B572	Pollution & Society				1					1			1										
M576	C I M				1									1	1	1		1		1			
M580a	Modeling & Simulation	1	1	1		1		1				1		1				1					
M574	Quality Control		1	1	1	1	1	1					1										
M581	Advanced Manuf. Proc.									1	1				1	1			1				
M599	Project II				1									1	1		1		1				

Appendix 2.1, Table-1c, Curriculum Mapping Matrix (C's)

Code	Subject	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
B101	English Language I											1	1										
B111	Mathematics I	1											1										
B121	Mechanics I	1	1					1															
B131	Physics I	1				1	1	1					1										
B141	Chemistry	1	1	1		1			1				1										
E111	Introd. To Computer I					1									1		1						
M150	Eng. Drawing I	1	1	1																			
M160	Production Eng. I	1		1				1															
B102	English Language II											1	1										
B112	Mathematics II	1											1										
B122	Mechanics II	1	1					1															
B132	Physics II	1				1							1										
B142	Descriptive Geometry					1																	
E112	Introd. To Computer II														1	1	1	1					
M151	Eng. Drawing II	1		1	1																		
M161	Production Eng. II	1		1				1															
A060	Civil Eng. Technology	1	1	1		1		1															
B200	English Language III											1	1										
B211	Mathematics III	1											1										
E211	Computer Prog. I						1								1	1			1				
M201	Fluid Mechanics		1	1		1							1				1	1					
M250	Engineering Skills I	1	1	1							1			1	1								
M251	Mechanics of Mach. I	1	1					1															
M261	Strength of Materials		1			1			1				1				1	1					
B202	History of Sci. & Tech.	1				1																	
B212	Mathematics IV	1											1										
E213	Computer Prog. II						1								1	1			1				
M222	Thermodynamics	1	1			1						1	1				1	1		1			
M252	Mechanics of Mach. II	1	1			1						1											
M253	Engineering Skills II	1	1								1			1	1								
M262	Material Technology I	1		1		1											1						
M271	Principles of Manuf.	1				1	1				1		1							1			
B300	English Language IV											1	1										
B311	Mathematics V	1											1										
E030	Elect&Electronic Eng.	1	1	1					1														
M310a	Comp. Applications I	1	1	1							1				1								1
M331	Thermo-Fluid Machinery	1	1		1	1	1	1						1				1					
M351	Mechanics of Mach III	1	1			1								1									
M360	Industrial Psychology	1	1								1												
M363	Manufacturing Tech I						1										1						
E050	Elect. Mach & Power Syst.	1	1			1		1									1						
M310b	Comp. Applications II	1							1	1						1						1	1
M312	Industrial Management	1				1	1																
M352	Measuring Instruments		1			1											1		1				
M364	Manufacturing Tech II	1	1			1					1			1	1	1				1			
M371	Machine Design I	1		1										1	1								
M399	Project I						1	1		1				1	1	1	1	1					
M400	Summer Training	1	1																				
B411	Mathematics VI	1			1																		
M454	Production Management	1					1	1															
M461	System Dynamics	1	1	1		1	1										1	1	1				
M471	Machine Design II	1		1									1	1									
M481	Manufacture Tech. III			1		1					1			1	1								
E051	Signal Processing	1	1			1	1								1			1					
M462	Material Technology II		1			1			1							1		1		1			
M472	C A D	1	1																				1
M474	Machine Tool Design		1			1	1							1	1	1							
M482	Automatic Control	1				1											1	1					
M552	Operations Research	1		1				1							1		1						
M561	Engineering Economy	1				1	1	1		1													
M571	C A M	1				1	1								1	1							
M573	Automation					1	1	1	1						1			1					
M578	Hydraulic Power Systems	1		1		1	1						1				1	1					
M580c	Prod Planning & Control	1	1	1				1			1			1						1			
M598	Technical Report Writing											1	1										
B512	Laws & Regul for Eng.	1				1																	
B572	Pollution & Society	1																					
M576	C I M														1			1					
M580a	Modeling & Simulation	1				1	1	1										1		1			
M574	Quality Control										1							1					
M581	Advanced Manuf. Proc.										1		1							1	1		
M599	Project II							1	1		1				1	1	1	1	1				

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Appendix 2.1, Table-1d, Curriculum Mapping Matrix (Ds)

Code	Subject	General transferrable skills (D)								
		01	02	03	04	05	06	07	08	09
B101	English Language I	1	1	1	1		1	1	1	
B111	Mathematics I			1				1		
B121	Mechanics I	1	1	1					1	1
B131	Physics I	1	1	1	1	1	1	1	1	1
B141	Chemistry	1	1	1	1	1		1		
E111	Introd. To Computer I	1		1	1			1		
M150	Eng. Drawing I	1		1				1		
M160	Production Eng. I	1		1			1			
B102	English Language II	1	1	1	1		1	1	1	
B112	Mathematics II	1		1				1		
B122	Mechanics II	1	1	1					1	1
B132	Physics II					1		1		
B142	Descriptive Geometry		1	1						
E112	Introd. To Computer II	1		1	1			1		
M151	Eng. Drawing II			1						1
M161	Production Eng. II	1		1				1		1
A060	Civil Eng. Technology						1			
B200	English Language III	1	1	1	1		1	1	1	
B211	Mathematics III			1				1		
E211	Computer Prog. I	1		1	1			1		
M201	Fluid Mechanics	1	1	1		1				
M250	Engineering Skills I	1	1	1						1
M251	Mechanics of Mach. I	1	1	1						
M261	Strength of Materials	1		1						1
B202	History of Sci. & Tech.	1						1	1	
B212	Mathematics IV			1				1		
E213	Computer Prog. II	1		1	1			1		
M222	Thermodynamics	1		1				1	1	
M252	Mechanics of Mach. II		1	1			1	1	1	1
M253	Engineering Skills II	1				1				1
M262	Material Technology I				1		1			1
M271	Principles of Manuf.	1	1	1		1	1			
B300	English Language IV	1	1	1	1		1	1	1	
B311	Mathematics V	1		1				1		
E030	Elect&Electronic Eng.	1	1		1		1			1
M310a	Comp. Applications I	1			1					1
M331	Thermo-Fluid Machinery		1	1	1	1		1		1
M351	Mechanics of Mach III		1	1			1	1	1	1
M360	Industrial Psychology					1	1			
M363	Manufacturing Tech I	1					1	1		
E050	Elect. Mach & Power Syst.		1	1			1	1		
M310b	Comp. Applications II	1			1					
M312	Industrial Management					1	1			
M352	Measuring Instruments	1	1		1					
M364	Manufacturing Tech II	1	1			1				1
M371	Machine Design I		1	1				1		1
M399	Project I	1	1	1	1	1	1			
M400	Summer Training	1	1	1						
B411	Mathematics VI			1	1			1		
M454	Production Management					1				1
M461	System Dynamics		1	1			1	1	1	1
M471	Machine Design II			1				1		1
M481	Manufacture Tech. III	1	1			1				
E051	Signal Processing	1			1	1	1	1	1	
M462	Material Technology II			1	1			1	1	1
M472	C A D				1	1				
M474	Machine Tool Design	1			1		1			
M482	Automatic Control			1	1			1		
M552	Operations Research				1			1		
M561	Engineering Economy	1	1	1				1		
M571	C A M		1		1					
M573	Automation	1		1			1	1		1
M578	Hydraulic Power Systems	1		1	1			1		1
M580c	Prod Planning & Control	1				1			1	
M598	Technical Report Writing							1	1	
B512	Laws & Regul for Eng.	1		1				1		1
B572	Pollution & Society	1		1						
M572	C I M	1	1				1			
M580a	Modeling & Simulation	1		1	1		1			
M575	Quality Control	1		1				1		
M581	Advanced Manuf. Proc.			1				1		1
M599	Project II	1	1	1	1	1	1			

Appendix 2

Courses Specifications

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Courses of the Program of
Manufacturing Engineering and Production Technology

1.	A060	Civil Engineering Technology
2.	B101	English Language I
3.	B102	English Language II
4.	B111	Mathematics I
5.	B112	Mathematics II
6.	B121	Mechanics I
7.	B122	Mechanics II
8.	B131	Physics I
9.	B132	Physics II
10.	B141	Chemistry
11.	B142	Descriptive Geometry
12.	B200	English Language III
13.	B202	History of Science & Technology
14.	B211	Mathematics III
15.	B212	Mathematics IV
16.	B300	English Language IV
17.	B311	Mathematics V
18.	B411	Mathematics VI
19.	B512	Laws and Regulations for Engineers
20.	B572	Pollution and Society
21.	E030	Electric& Electronic Circuits
22.	E050	Electrical Power Systems
23.	E051	Signal Processing
24.	E111	Introduction to Computers I
25.	E112	Introduction to Computers II
26.	E210	Computer Programming I
27.	E213	Computer Programming II
28.	M150	Engineering Drawing &Projection I
29.	M151	Engineering Drawing & Projection II
30.	M160	Production Engineering -Workshop I
31.	M161	Production Engineering - Workshop II
32.	M201	Fluid Mechanics
33.	M222	Thermodynamics
34.	M250	Engineering Skills I
35.	M251	Mechanics of Machines I
36.	M252	Mechanics of Machines II
37.	M253	Engineering Skills II
38.	M261	Strength of Materials
39.	M262	Materials Technology
40.	M271	Principles of Manufacturing
41.	M310a	Computer Applications I
42.	M310b	Computer Applications II
43.	M312	Industrial Management
44.	M331	Thermo-Fluid Machinery
45.	M351	Mechanics of Machines III
46.	M352	Measuring Instruments& Instrumentation

47.	M360	Industrial Psychology
48.	M363	Manufacturing Technology I
49.	M364	Manufacturing Technology II
50.	M371	Machine Design I
51.	M399	Project I
52.	M400	Summer Training
53.	M454	Production Management
54.	M461	System Dynamics & Vibrations
55.	M462	Materials Technology II
56.	M471	Machine Design II
57.	M472	Computer Aided Design (CAD)
58.	M474	Machine Tool Design
59.	M481	Manufacturing Technology III
60.	M482	Automatic Control
61.	M552	Operations Research
62.	M561	Engineering Economy
63.	M571	Computer Aided Manufacturing (CAM)
64.	M573	Automation
65.	M574	Quality Control
66.	M576	Computer Integrated Manufacturing (CIM)
67.	M578	Hydraulic Power Systems
68.	M580a	Modeling & Simulation (Elective II)
69.	M580b	Management Information Systems
70.	M580c	Production Planning & Control (Elective I)
71.	M581	Advanced Manufacturing Processes
72.	M598	Report
73.	M599	Project II

Modern Academy for Engineering & Technology
Manufacturing Engineering & Production Technology Department

A060: Civil Engineering Technology
Course Specifications

A- Affiliation

Relevant programs:	Computer Engineering & Information Technology BSc. Program
	Electronic Engineering & communication Tech. BSc. Program.
	Manufacturing Engineering & Production Tech. BSc program
Departments offering the programs:	Computer Engineering & Information Technology BSc. Program
	Electronic Engineering & communication Tech. BSc. Program.
	Manufacturing Engineering & Production Tech. BSc program
Department offering the course:	Architecture Engineering Department
Date of specifications approval:	September 2015

B - Basic Information

Title: Civil Engineering Technology   **Code:** A060   **Year/level:** 2nd year / 1st Term

Teaching Hours: **Lectures: 2**   **Tutorial: 2**

  Practical: --   **Total: 4**

C - Professional Information
1 – Course Learning Objectives
A study of this course will enable the student to:
- Introduce the principles of Civil engineering technology.
- Study civil engineering applications on different   constructions.

2 - Intended Learning Outcomes (ILOS)
A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1-The technology of building construction methods (A3, A4, A8)
a2- Soil mechanics science (A3, A4, A8)
a3- Process of surveying (A4)
a4-Theory of structures (A4)
a5- Quantities of civil construction works (A7)

B - Intellectual skills
By the end of the course the student should be able to:
b1-Analyze simple construction projects (B1)
b2-Choose suitable solution from different alternatives (B2, B9)
b3- Applying different equations to solve civil projects (B2, B9)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Perform longitudinal and transverse leveling. (C1)
c2- Compute quantities of civil works. (C1, C7)
c3- Design using civil standard systems. (C2, C3)
c4- Calculate quantities of earth excavation and fill. (C5)

D - General and transferable skills
By the end of the course the student should be able to:
d1- Application of civil technology in every day life. (D6)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A4, A7, A8
B	Intellectual skills	B1, B2, B9
C	Professional and practical skills	C1, C2, C3, C5, C7
D	General and transferable skills	D6

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction for Civil Engineering technology	2	2	
• Fundamentals of surveying	2	2	
• Measurement of areas from maps and measurement of angles	2	2	
• Leveling	2	2	
• Computation of volumes	2	2	
• Soil mechanics	2	2	
• Highway and airports engineering	2	2	
• Theory of Structures	2	2	
• Building construction technology	2	2	
• Masonry construction	2	2	
• Foundations	2	2	
• Isolating layers	2	2	
• Building materials	2	2	
• Quantities computations	2	2	
• Computation of the civil works	2	2	
Total hours	**30**	**30**	

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
			Teaching Methods						Learning Methods				Assessment Method				
Knowledgea4	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
	a4	1			1	1		1					1		1	1	1
	a5	1			1	1		1	1	1			1			1	1
Intellectu	b1		1	1				1	1	1						1	
	b2			1	1	1		1								1	1
	b3				1	1		1	1				1		1	1	1
Applied	c1							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	1	1
Gener	d1		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	7th Week	10
Practical Exam	-	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes
Properties and Resistance of Materials, Adham Elalfy, lecture notes

6-2 Required books
د. كريم محمد عطا، المواد الهندسية، دار الكتب، ١٩٩٥

6-3 Recommended books
Non

6-4 Periodicals, Web sites, etc.
www.ACI.com

7- Facilities Required for Teaching and Learning
- Classroom
- Survey lab.

Course coordinator: Assist. Prof. Adham ElAlfy
Head of the Department: Assist. Prof. Nahed Omran
Date: September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B101: English Language I
Course Specifications

A- Affiliation

Relevant programs:	Computer Engineering & Information Technology BSc. Program
	Electronic Engineering & communication Tech. BSc. Program
	Manufacturing Engineering & Production Tech. BSc. Program
	Architectural Engineering & Building Technology BSc. Program

Departments offering the programs:	Computer Engineering & Information Technology Dept.
	Electronic Engineering & communication Tech. Dept.
	Manufacturing Engineering & Production Tech. Dept.
	Architectural Engineering & Building Technology Dept.

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

B - Basic Information

Title: English Language I   **Code:** B101   **Year/level:** 1-st year / 1-st Term
Teaching Hours: **Lectures:** 2   **Tutorial:** --
  Practical: --   **Total:** 2

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 everyday 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 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
Engineering, what's it all about?	6		
Alfred Nobel.	6		
Use of Prepositions.	2		
Adjectives: synonyms and anatomies.	2		
Infinitive and Gerund.	2		
Subject verb agreement Count & non –count nouns	4		
General exercises.	4		
Revision	4		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

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

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: quizzes, assignments and class participation	Bi-Weekly	10
Mid-Term Exam	6-th Week	5
Practical Exam	-	
Written Exam	Sixteenth week	35
Total		50

6- List of references:

6-1 Course notes:

  Learn, apply and Excel by Prof. Dr. A. H. El. Khoreiby

6-2 Required books

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

6-3 Recommended books:

   Shelton, James**, English for Engineering,** NTC publishing Group, Illinois, USA, 2008.

6-4 Periodicals, Web sites, etc.:

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

7- Facilities required for teaching and learning:

   Library and Internet

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

Modern Academy for Engineering & Technology
Basic Sciences Department

B102: English Language II
Course Specifications

A- Affiliation
Relevant programs:	Computer Engineering & Information Technology
	Electronic Engineering & communication Technology
	Manufacturing Engineering & Production Technology
	Architectural Engineering & Building Technology
Departments offering the programs:	Computer Engineering & Information Technology Dept.
	Electronic Engineering & communication Tech. Dept.
	Manufacturing Engineering & Production Tech. Dept.
	Architectural Engineering & Building Technology Dept.

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

B - Basic Information
Title: English Language II   **Code:** B102   **Year/level:** 1-st year / 2-nd Term
Teaching Hours: **Lectures: 2   Tutorial: --**
   Practical: --   Total: 2

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 everyday 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 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
• A Symphony in Concrete	8		
• The electricity	10		
• Subject, verb, object	4		
• Verb to be	4		
• Revision	4		
Total hours	**30**		

4 - Teaching and Learning and Assessment methods:

	Course ILO's	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1	1					1				1		1		1
	a2	1	1	1					1				1		1		1
	a3	1	1	1					1				1		1		1
Intellectual	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	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.	d1	1	1	1					1				1				
	d2	1	1	1					1								
	d3	1	1	1					1								1
	d4	1	1	1					1								
	d5								1								

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	5
Practical Exam	-	-
Written Exam	Sixteenth week	35
Total		50

6- List of References
6-1 Course notes
El. Khoreiby A. H., Learn, Apply and Excel, lecture notes, Modern Academy Press, 2010.
6-2 Required books
Shelton, James, *Handbook for technical writing*, NTC publishing Group, Illinois, USA, 1998.
6-3 Recommended books:
Shelton, James**, English for Engineering,** NTC publishing Group, Illinois, USA, 2008.
6-4 Periodicals, Web sites, etc.:
- http://www.bbc.co.uk/learningenglish
- http://www.rong-chang.com/
- http://legacy.australianetwork.com/studyenglish/

7- Facilities Required for Teaching and Learning
- Library
- Internet

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

Modern Academy for Engineering & Technology
Basic Sciences Department

B111: Mathematics I
Course Specifications

A- Affiliation

Relevant programs:	Computer Engineering & Information Technology
	Electronic Engineering & communication Technology
	Manufacturing Engineering & Production Technology
	Architectural Engineering & Building Technology
Departments offering the program:	Computer Engineering & Information Technology Dept.
	Electronic Engineering & communication Tech. Dept.
	Manufacturing Engineering & Production Tech. Dept.
	Architectural Engineering & Building Technology Dept.
Department offering the course:	Basic Sciences Department
Date of specifications approval:	September 2015

B - Basic Information

Title: Mathematics I   **Code:** B111   **Year/level:** 1-st year / 1-st Term
Teaching Hours: **Lectures: 4**   **Tutorial: 2**
   Practical: --   **Total: 6**

C - Professional Information

1 – Course Learning Objectives

The main objective of this course is to introduce the main concepts of Differential calculus and modern algebra and their applications.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- Rules of limits and continuity of functions of one variable.(A1)
a2- Differentiation concepts. (A1)
a3- Rules of Applications of differential calculus used engineering. (A1, A5)
a4- Basic concepts of mathematical logic and apply it to applications. (A1, A5)
a5- Relations and mappings. (A1)
a6- Properties of Algebraic structure and its applications. (A1)

B - Intellectual skills

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

b1- Solve problems on limits, continuity and differentiate all continuous function. (B1, B3)
b2- Use differential calculus to solve applied Engineering Models. (B1, B2, B7)
b3- Use mathematical logic solve applied Engineering Models. (B1, B2, B7)
b4- Solve problems on relations and mapping used in different applications. (B1, B3)
b5- Use Algebraic structure used in different applications. (B1, B3)

C - Professional and practical skills

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

c1- Apply differential calculus in mechanics and electronics. (C1, C12)

D - General and transferable skills

By the end 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 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
Calculus		
• Function limit continuity	4	2
• Derivatives	4	4
• Inverse function and trigonometric function	4	2
• Exponential and Logarithmic function	4	2
• Hyperbolic and inverse hyperbolic functions	4	2
• Application of differential calculus	10	3
Modern Algebra		
• Sets	4	2
• Mathematical logic with applications	4	2
• Relation	6	3
• Mapping	6	3
• Algebraic structure	6	3
• Final Revision	4	2
Total hours	**60**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method				
		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches	Modeling and Simulation	Site Visits	Discovering	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
	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	b1	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
	b5	1			1	1			1				1		1		1
Applied	c1	1		1								1					
General	d1			1		1			1								1
	d2			1	1	1			1								1
	d3	1															1

5- Assessment Timing and Grading:

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

6- List of References
6-1 Course Notes:
Osama El-Gayar, Differential calculus, Lecture Notes, Modern Academy, 2011
Mohammad Khalifa, Modern Algebra, Lecture Notes, Modern Academy, 2011
6-2 Required books
B. S. Votsa, "Modern Algebra", 2-nd Edition, New Age International Limited Publisher, New Delhi, 2010.
6-3 Recommended books
E. W. Swokoski, "Calculus", 6-th Edition, PWS Publishing Company, Boston, 1994.
6-4 Periodicals, Web sites, etc.
www.mathwords.com
www.17calculus.com
www.sosmath.com

7- Facilities Required for Teaching and Learning
- Library
- Internet

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

Modern Academy for Engineering & Technology
Basic Sciences Department

B112: Mathematics II
Course Specifications

A- Affiliation
Relevant programs: 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

Departments offering the programs: Computer Engineering & Information Technology Dept.
Electronic Engineering & communication Tech. Dept.
Manufacturing Engineering & Production Tech. Dept.
Architectural Engineering & Building Technology Dept.

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

B - Basic Information

Title: Mathematics II   **Code:** B112   **Year/level:** 1-st year / 2-nd Term
Teaching Hours: **Lectures: 4**   **Tutorial: 2**
          Practical: --   **Total: 6**

C - Professional Information

1 – Course Learning Objectives
By the end of this course the students should be able to apply, demonstrate the knowledge and understanding of the the concepts of integral calculus and theory of linear algebra 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. Solutions of linear systems using different methods. (A1, A3)
a6. Basic concepts of vectors, vector spaces and vector algebra. (A1, A3)
a7. Basics of Analytic geometry and basics of complex numbers. (A1, A3)
a8. Fundamentals of 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)

b7. Solve linear systems using different methods of linear algebra. (B2, B3, B4)

b8. Solve problems on vectors, vector spaces and vector algebra. (B2, B3, B4)

c - Professional and practical skills:

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

   c1. apply methods of integration and to engineering problems.(C1,C12)

d - General and transferable skills:

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

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

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

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

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours
Calculus of integration		
• Indefinite integral	4	2
• Definite integral	2	2
• Techniques of integration	10	6
• Applications of definite integrals	8	2
• Infinite series with applications	6	3
Linear Algebra and Analytic Geometry		
• Matrices with applications	6	4
• Vector spaces	4	2
• Vector Algebra • Geometry in three dimensions	4	2
• Polar Coordinates	4	2
• Complex numbers	2	2
• Conic sections	4	1
• Final Revision	6	2
Total hours	**60**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method				
		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1				1				1		1		1
	a2	1	1		1	1							1		1		1
	a3	1			1	1							1		1	1	1
	a4	1		1	1	1			1				1		1	1	1
	a5	1	1		1	1			1				1		1	1	1
	a6	1		1	1	1			1				1		1	1	1
	a7	1	1		1	1			1				1		1		1
	a8	1			1	1			1				1		1		1

Intellectual	b1	1			1	1					1		1		1
	b2	1			1	1					1		1	1	1
	b3	1	1	1	1	1			1		1		1	1	1
	b4	1			1	1					1		1		1
	b5	1			1	1					1		1	1	1
	b6	1		1	1	1			1		1			1	1
	b7	1	1		1	1			1		1			1	1
	b8	1		1	1	1			1		1			1	1
Applied	c1	1			1		1		1		1				1
General	d1			1		1			1					1	
	d2		1	1					1					1	
	d3		1	1					1					1	

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes:
M. Khalefa, Integration and Analytic Geometry, Lecture Notes, 2013

M. Khalefa, Linear Algebra, Lecture Notes, 2013

6-2 Required books
R. E. Larson and B. H. Edwards, "Elementary Linear Algebra", 2-nd Edition, DG Heath and Company, Toronto, 1991.

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

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

6-3 Recommended books:
E. Kreyszig, Advanced Engineering Mathematics, 8ed, John Willey & Sons, Inc., 1999

6-4 Periodicals, Web sites, etc.
www.sosmath.com

www.mathworlds.com.

7- Facilities Required for Teaching and Learning
- Library, Required References.
- Computer and Internet
- Data show

Course Coordinator: Dr. Sameh Elshenawy

Head of the Department: Prof. Laila Soliman

Date: September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B121: Mechanics I
Course Specifications

A- Affiliation
Relevant programs:
Computer Engineering & Information Technology BSc Program
Electronic Engineering & communication Technology BSc Program
Manufacturing Engineering & Production Technology BSc Program
Architectural Engineering & Building Technology BSc Program

Departments offering the programs:
Computer Engineering & Information Technology Dept.
Electronic Engineering & communication Tech. Dept.
Manufacturing Engineering & Production Tech. Dept.
Architectural Engineering & Building Technology Dept.

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

B - Basic Information
Title: Mechanics I **Code:** B121 **Year/level:** 1-st year / 1-st Term
Teaching Hours: **Lectures:** 2 **Tutorial:** 2
  Practical: -- **Total:** 4

C - Professional Information

1 – Course Learning Objectives
A study of this course will introduces the basic concepts of statics in plane and space: (force resultant equilibrium analysis of structures).

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

b - Intellectual skills:
On successful completion of the course, the student should be able to.
b1- Analyze and classify between equilibrium in plane and equilibrium in space(B1, B2, B11).
b2- Classify and compare the different between equilibrium of a single rigid body and all forces involved were external to the rigid body(B1,B3) .

c - Professional and practical skills:
On successful completion of the course, the student should be able to:
c1- Solve the equations of equilibrium to get three unkownes(C1,C2).
c2- Solve the trusses to get the value of the forces in the structural by joints and by section methods(C1,C7).

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, D3).
d2- Search for information in references and in internet(D2, D9)

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Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4
B	Intellectual skills	B1, B2, B3, B4, B11
C	Professional and practical skills	C1, C2, C7
D	General and transferable skills	D1, D2, D3, D8, D9

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 & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1	1			1				1		1	1	1
	a2	1			1	1							1		1	1	1
	a3	1			1	1			1				1		1	1	1
	a4	1			1	1			1				1		1	1	1
Intelle	b1	1			1								1		1		1
	b2	1			1	1							1		1	1	1
Applie	c1	1			1	1							1		1	1	1
	c2	1			1								1		1	1	1
Gener	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
Practical Exam	-	-
Written Exam	Sixteenth week	70
Total		100

6- List of References
6-1 Course notes
Hassan Awad, Mechanics I, Modern Academy Press, 2011.

6-2 Required booksReferences (text book)

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

6-3 Recommended books

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

6-4 Periodicals, Web sites, etc.

www.mathwprlds.com
www.exchange.com

7- Facilities Required for Teaching and Learning

- Library
- Internet

Course coordinator:	Dr Moamen Wafaee
Head of the Department:	Prof. Laila Soliman
Date:	September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B122: Mechanics II
Course Specifications

A- Affiliation
Relevant programs:
Computer Engineering & Information Technology
Electronic Engineering & communication Technology
Manufacturing Engineering & Production Technology
Architectural Engineering & Building Technology

Departments offering the programs:
Computer Engineering & Information Technology Dept.
Electronic Engineering & communication Tech. Dept.
Manufacturing Engineering & Production Tech. Dept.
Architectural Engineering & Building Technology Dept.

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

B - Basic Information
Title: Mechanics II   **Code:** B122   **Year/level:** 1-st year / 2-nd Term
Teaching Hours: **Lectures: 2**   **Tutorial: 1**
                                 Practical: --   **Total: 3**

C - Professional Information

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge
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, A3).
a2- defention of differentiation and integration (A1)
a3- classification the particle's motion in straight line and in curved path and it's applications (A3,A4)
a4- understanding the dynamics system and the effect of forces on the system in different coordinates (A4).
a5- classification of two methods of kinetics, namely,the method of work and energy and method of impulse and momentum. (A4)

B - Intellectual skills
By the end of the course the student should be able to:
On successful completion of the course, the student should be able to.
b1- analyze and classify between the force acting on the system to get it's value and the principle of work and energy to get the velocity of the particle (B1, B2,B11)
b2- classify and compare the different between the average velocity and average speed (B4,B5, B13).

C - Professional and practical skills
On successful completion of the course, the student should be able to:
c1- solve the equation of motion to get velocity, acceleration and total distance traveled at any time. (C1,C2)
c2- calculate the time of flight of projectile to get a target. (C1, C7).
c3- solve the equation of motion graphically.(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, D9)

d2- search for information in references and in internet (D2, D8).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1 A3, A4
B	Intellectual skills	B1, B2, B3, B4, B11, B13
C	Professional and practical skills	C1, C2, C7
D	General and transferable skills	D1, D2, D3, D8, D9

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	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1	1			1				1		1	1	1
	a2	1			1	1							1		1	1	1
	a3	1			1	1			1				1		1	1	1
	a4	1			1	1			1				1		1	1	1
	A5	1			1								1		1	1	1
Intellectual	b1	1			1								1		1		1
	b2	1			1	1							1		1	1	1
Applied	c1	1			1	1							1		1	1	1
	c2	1			1											1	1
	c3	1			1	1										1	1
General	d1					1			1							1	
	d2								1							1	

5- Assessment Timing and Grading:

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

6- List of References
6-1 Course notes
Hassan Awad, Mechanics II, Lecture Notes, Modern Academy Press, 2011.
6-2 Required booksReferences (text book)
-Beer and Johnston, Vector Mechanics for Engineers- Dynamics, 8th Edition in SI Units, ISBN 978-007-125765-7, U.S.A., 2007.

6-3 Recommended books
R.C. Hibbeler, Engineering mechanics, Dynamics, McGraw-Hill, 2005
6-4 Periodicals, Web sites, etc.
www.mathwprlds.com
www.exchange.com

7- Facilities Required for Teaching and Learning
- Library
- Data show and computer programs

Course Coordinator: Dr. Moamen Wafaee
Head of the Department: Prof. Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B131: Physics I
Course Specifications

A- Affiliation

Relevant programs: Computer Engineering & Information Technology BSc Program
Electronic Engineering & communication Tech. BSc Program
Manufacturing Engineering & Production Tech. BSc Program
Architectural Engineering & Building Technology BSc Program

Departments offering the programs: Computer Engineering & Information Technology Dept.
Electronic Engineering & communication Tech. Dept.
Manufacturing Engineering & Production Tech. Dept.
Architectural Engineering & Building Technology Dept.

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

B - Basic Information

Title : Physics I   **Code:** B131   **Year/level:** 1-st year / 1-st Term
Teaching Hours: **Lectures: 4**   **Tutorial: --**
                             Practical: 2   **Total: 6**

C - Professional Information

1 – Course Learning Objectives

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

B - Intellectual skills

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

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

b7- differentiate and compare the different types of waves. (B1, B2, B11).

C - Professional and practical skills

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

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

c2- validate the concepts of some of the studied physical phenomena.(C1,C12,C7)

c3- determine different dimensions using Vernier calipers, micrometer and speedometer.(C5,C6)

c4- use experimental facilities to measure the acceleration due to gravity and the force constant. (C6,C12,C5)

c5- perform experiments on heat to get practically the specific heat of different materials, the expansion coefficient of a solid, and the viscosity of a viscous liquid.(C1,C5,C6)

c6- determine the velocity of sound in air using resonance tube. (C1,C5,C6)

c7- use experimental facilities to verify the inverse square law of radiation. (C1,C5,C6)

D - General and transferable skills

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

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

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

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

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

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

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4
B	Intellectual skills	B1, B2, B3, B7, B11
C	Professional and practical skills	C1, C5, C6, C7, C12
D	General and transferable skills	D1, D2, D3, D4, D5,D6,D7,D8,D9

3 – Contents

Topic	Lecture hours	Practical hours
• Units and dimensions	4	2
• Rotational motion	6	2
• Gravitation	6	2
• Elasticity	6	2
• Fluid flow	6	2
• Viscosity surface tension	4	2
• Temperature And heat	4	6
• Heat transfer	6	2
• Thermodynamic	6	2
• Simple harmonic Motion,	4	2
• Sound waves	4	2
• Revision	4	4
Total hours	**60**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's	Teaching Methods							Learning Methods				Assessment Method				
	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments

Knowledge	a1	1			1	1	1	1		1			1	1	1	1	1
	a2	1			1	1	1	1		1			1	1	1	1	1
	a3	1			1	1	1	1		1			1	1	1	1	1
	a4	1			1	1	1	1		1			1	1	1	1	1
	a5	1			1	1	1	1		1			1	1	1	1	1
	a6	1			1	1	1	1		1			1	1	1	1	1
	a7	1			1	1	1	1		1			1	1	1	1	1
	a8	1			1	1	1	1		1			1	1	1	1	1
	a9	1			1	1	1	1		1			1	1	1	1	1
	a10	1			1	1	1	1		1			1	1	1	1	1
Intellectual	b1	1			1	1	1	1		1			1	1	1	1	1
	b2	1			1	1	1	1		1			1	1	1	1	1
	b3	1			1	1	1	1		1			1	1	1	1	1
	b4	1			1	1	1	1		1			1	1	1	1	1
	b5	1			1	1	1	1		1			1	1	1	1	1
	b6	1			1	1	1	1		1			1	1	1	1	1
	b7	1			1	1	1	1		1			1	1	1	1	1
Applied	c1				1	1	1	1		1			1	1	1	1	1
	c2							1						1				1
	c3							1						1			
	c4							1						1			
	c5							1						1			
	c6							1						1			
	c7							1						1			
General Tran.	d1	1	1	1			1		1								
	d2		1	1		1			1				1				
	d3	1		1		1	1		1			1	1				
	d4					1				1	1	1	1				
	d5		1			1			1			1					
	d6					1			1	1	1	1	1				

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes:
- M. El- Tawab Kamal , Abo- Elyzeed B. Abo- Elyzeed, Marwa Yahia Shoeib and Nagat A. Salam Elmahdy, Physics 1- Properties of Matter Lecture Notes, Modern Academy, 2010.
- M. El- Tawab Kamal , Abo- Elyzeed B. Abo- Elyzeed, Marwa Yahia Shoeib and Nagat A. Salam Elmahdy, Physics Lab, Modern Academy, 2010.

6-2 Required books
Raymond A. Serway, Physics for Scientists and Engineers, Thomson Brooks, 2010; 8th Edition.

6-3 Recommended books:
Halliday, David, Robert Resnick, Jearl Walker. Fundamentals of Physics, 10th ed. Hoboken, N.J.: John Wiley and Sons. 2014.

6-4 Periodicals, Web sites, etc.
http.www.saunderscollege.cpm/physics
http://en.wikipedia.org/wiki/Bernoul/principle
http://www.physicsclassroom.com/calcpad/circgrav/

http://physicsworld.com/
http://www.britannica.com/science/wave-motion
http://physics.info/

7- Facilities Required for Teaching and Learning

- Library
- Computer, Internet, and Data Show
- Laboratories (Lab 1, Lab 2).

Course Coordinator: Dr. Nagat A. Elmahdy
Head of the Department: Prof. Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B132: Physics II
Course Specifications

A- Affiliation

Relevant programs:	Computer Engineering & Information Technology BSc Program
	Electronic Engineering & communication Technology BSc Program
	Manufacturing Engineering & Production Technology BSc Program
	Architectural Engineering & Building Technology BSc Program
Departments offering the programs:	Computer Engineering & Information Technology Dept.
	Electronic Engineering & communication Tech. Dept.
	Manufacturing Engineering & Production Tech. Dept.
	Architectural Engineering & Building Technology Dept.
Department offering the course:	Basic Sciences Department
Date of specifications approval:	September 2015

B - Basic Information

Title: Physics II   **Code:** B132   **Year/level:** 1-st year / 2-nd Term

Teaching Hours: **Lectures: 2**   **Tutorial: 2**

    Practical: 2   **Total: 6**

C - Professional Information

1 – Course Learning Objectives

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- Fundamental and basic law of applications in electricity, magnetism and electromagnetism (A1 , A3) .

a2- Gausses law in electricity for different type of charged bodies (A1 , A3).

a3- Laws of electric capacitors and effect of dielectric (A5).

a4- Direct current, resistance and solution of simple electric circuits and kerchief's laws (A5)

a5- Analogy between magnetic field and electric field., and application of Ampere's law, Gausse's law in magnetism (A3) .

a6- Magnetic properties of matter (A3, A5).

a7- Fundamental theories of Electro-magnetic waves and main physical phenomena of physical optics (interference, diffraction and polarization) (A5)

.B - Intellectual skills

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

b1- Investigate electric force and electric field (using Gauss's law) and select the proper manner to solve problem (B2, B3, B4).

b2- Study of capacitors' and dielectric effect, uses of capacitors, and use Kirchoff's laws to solve simple electric circuits (B3,B4).

b3- Investigate and 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, B4,B5).

C - Professional and practical skills

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

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

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

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

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

D - General and transferable skills

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

d1- Write technical reports(D5)

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

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

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Charge and Matter, The Electric Field, Gauss' law	2	2	2
• Gauss's law, Electric Potential	2	2	2
• Gauss's law applications	2	2	2
• Capacitors and Dielectric	2	2	2
• Current and Resistance, Electromotive force and Circuits	2	2	2
• The Magnetic Field, Ampere's Law	2	2	2
• Ampere's law, Inductance	2	2	2
• Magnetic Properties of matter	2	2	2
• Magnetic Properties of matter, Electromagnetic Waves	2	2	2
• Electromagnetic Waves	2	2	2
• Electromagnetic Waves, Physical Optics, Polarization of light	2	2	2
• Polarization of light	2	2	2
• Interference of light	2	2	2
• Interference of light, Diffraction of light	2	2	2
• Diffraction of light, Some applications	2	2	2
Total hours	**30**	**30**	**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	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1	1	1		1				1	1	1	1	1
	a2	1			1	1							1		1	1	1
	a3	1		1	1	1	1						1	1	1	1	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

Intellectu	b1	1			1	1						1		1	1	1
	b2	1			1	1						1		1	1	1
	b3	1		1	1			1							1	1
Applied	c1	1			1		1		1				1		1	1
	c2	1			1	1	1		1				1		1	1
	c3	1			1		1		1				1		1	1
	c4	1			1		1		1				1		1	1
General	d1	1		1		1			1						1	1
	d2			1					1						1	1
	d3			1					1						1	1

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

M. El- Tawab Kamal , Abo- Elyzeed B. Abo- Elyzeed, Marwa Yahia Shoeib and Nagat A. Salam Elmahdy, Electricity, Magnetisms and Optics, Lecture notes, Modern Academy, 2012.

6-2 Required books:

Serway, R. A. (2010) Physics for Scientists and Engineers with Modern Physics, 8rd ed. Wiely, New York.

6-3 Recommended books

Halliday, David, Robert Resnick, Jearl Walker. Fundamentals of Physics, 10th ed. Hoboken, N.J.: John Wiley and Sons. 2014.

6-4 Periodicals, Web sites, etc.

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

7- Facilities Required for Teaching and Learning

- Physics Lab.
- Computer, and Data show
- Library
- Internet

Course Coordinator: Dr. Marwa Shoeib
Head of the Department: Professor Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology
Basic sciences Department

B141: Chemistry
Course Specifications

A- Affiliation

Relevant programs:
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

Departments offering the programs:
Computer Engineering & Information Technology Dept.
Electronic Engineering & communication Tech. Dept.
Manufacturing Engineering & Production Tech. Dept.
Architectural Engineering & Building Technology Dept.

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

B - Basic Information

Title: Chemistry | **Code:** B141 | **Year/level:** 1-st year / 1-st Term
Teaching Hours: | **Lectures:** 2 | **Tutorial:** --
| **Practical:** 2 | **Total:** 4

C - Professional Information

1 – Course Learning Objectives

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

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

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

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

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

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

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

B - Intellectual skills

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

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

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

b3- Exercise professional judgment with respect to commercial and technical risks.(B1)

b4-Overlap different scientific subjects to reach a new scientific systems with a better quality.(B1,B3.B4,B12,B10)

b5-Think in a creative new scientific ideas which are not exist in present time to be used in the fee ten line the field of development of energy recourses, pollution problem, new industrial products.(B3, B12)

b6- Select appropriate solutions for corrosion problems based on analytical thinking.(B1,B2,B6,B8)

b7- Consider the applicability, economy and risk management.(B4)

b8-Maintain a systematic and methodic approach in dealing with new advanced industrial products.(B1)

C - Professional and practical skills

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

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

c2- Employ computational facilities, measuring instruments, Laboratory tools and equipment to design an experiment to treat underground water and make it safe for Human use. (C1,C5)

c3- Improve plan and execute project work including the preparation of descriptive and interpretative technical reports.(C2,C3,C5,C8)

c4- Create and design for a certain system using the subject information given during.(C2, C3, C8)

c5- Improve the designed system to be compatible with Eng. Conditions.(C2, C3, C8)

c6- Apply experimental facilities to investigate the system performance.(pH and water hardness degree).(C2, C3, C5, C8)

c7- Prepare and present technical materials.(Soaps, detergents, and some polymeric samples).(C2)

c8- Observe, record and analyze data in lab. As well as in Field.(Lab Fresh water and underground water).(C5)

c9- Use appropriate tools to measure system performance.(C5)

c10- Present work both in written and oral form.(C12)

D - General and transferable skills

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

d1- Improving own learning and performance, personal skills, working with others.(D1,D2,D3)

d2- Search for information from references, journals and internet.(D3)

d3- Write technical reports and prepare convenient presentations.(D5)

d4- Use the E-mail for communication.(D3,D4,D7)

Course Contribution in the Program ILO's

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

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1	1	1		1		1				1		1	1	
	a2	1			1								1		1	1	1
	a3	1			1								1		1	1	1
	a4	1	1	1	1	1	1		1				1		1	1	1
	a5	1					1						1	1	1	1	1
	a6	1							1				1			1	1
Intellectual	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	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	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:

Goda,S. Chemistry for engineering & applied sciences, Lecture note, MAM Press, 2014.

6-2 Required books:

Steedman, Snadden and Anderson, Chemistry for the engineering and applied sciences, Pergamon Press, Oxford, 1986

6-3 Recommended books: Non

6-4 Periodicals, Web sites, etc

www.seciensedaily.com.

www.encyclopedia.com.
www.nasa,com
www.science.com

7- Facilities Required for Teaching and Learning

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

Course Coordinator:	Dr Shimaa Nabih Esmail
Head of the Department:	Prof. Laila Soliman
Date:	September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B142: Descriptive Geometry
Course Specifications

A- Affiliation

Relevant programs: Computer Engineering & Information Technology BSc Program
Electronic Engineering & communication Technology BSc Program
Manufacturing Engineering & Production Technology BSc Program
Architectural Engineering & Building Technology BSc Program

Departments offering the programs: Computer Engineering & Information Technology Dept.
Electronic Engineering & communication Tech. Dept.
Manufacturing Engineering & Production Tech. Dept.
Architectural Engineering & Building Technology Dept.

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

B - Basic Information

Title: Descriptive Geometry **Code:** B142 **Year/level:** 1-st year / 2-nd Term
Teaching Hours: **Lectures:** 2 **Tutorial:** 2
 Practical: -- **Total:** 4

C - Professional Information

1 – Course Learning Objectives

The course basically aims at introducing students to kinds of projections - plane geometry - mong's projection - Representation of points - straight lines - plane - Auxiliary projection planes - position problems - Metric problems - Polyhedral - Development - Circle - Sphere - Cone - Cylinder - Plane sections - Helix and helical curves- Helical surfaces.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge
a1- Principles of design including elements design, process and/or a system related to specific disciplines. (A1, A4)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Think in a creative and innovative way in problem solving and design. (B3)
b2- Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. (B4)
b3- Think three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design. (B3)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Practice the neatness and aesthetics in design and approach (C4)

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- Communicate effectively (D3)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4
B	Intellectual skills	B3, B4
C	Professional and practical skills	C4
D	General and transferable skills	D2, D3

3 – Contents

Topic	Lecture hours	Tutorial hours
• Kinds of projections	2	2
• Plane geometry.	2	2
• Representation of points.	2	2
• straight lines	4	4
• Plane.	4	4
• Auxiliary projection planes.	4	4
• position problems	2	2
• Metric problems	2	2
• Plane sections	4	4
• Circle.	2	2
• Revision	2	2
Total hours	**30**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledg	a1	1	1		1	1			1				1		1	1	1
Intellectu	b1	1	1		1	1				1			1		1	1	1
	b2	1	1		1	1				1			1		1	1	1
Ap	b3	1	1		1	1				1			1		1	1	1
	c1		1	1											1		
Gener	d1		1	1											1		
	d2		1	1											1		

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes: Non

6-2 Required books:
    R.K. Dhawan, " A First Year Engineering Drawing", Katson Publishing, 1982

6-3 Recommended books:
    James H.Earle, "Graphics for Engineers", Addison Wesley Longman Publishing Co; 2nd edition, 1989.

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

7- Facilities Required for Teaching and Learning

- Library
- Data show

Course Coordinator: Dr. Mona El Basyouni
Head of the Department: Prof. Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department
B200: English Language III
Course Specifications

A- Affiliation
Relevant programs: Computer Engineering & Information Technology BSc Program
                                   Electronic Engineering & communication Technology BSc Program
                                   Manufacturing Engineering & Production Technology BSc Program

Departments offering the programs: Computer Engineering & Information Technology Dept.
                                          Electronic Engineering & communication Tech. Dept.
                                          Manufacturing Engineering & Production Tech. Dept.

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

B - Basic Information
Title: English Language III   **Code:** B200   **Year/level:** 2-nd year / 1-st Term
Teaching Hours: **Lectures:** 2   **Tutorial:** --
                                         Practical: --   **Total:** 2

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 everyday 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 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
• Sir Isaac Newton.	8
• Making A Talkie Film.	8
• Energy Sense Makes Future Sense.	4
• Plural of nouns	4
• Regular and irregular verbs	4
• 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	Laboratory & Experiments	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	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	1
	a3	1	1	1					1				1		1	1	1
Intellectual	b1	1	1	1					1				1		1	1	1
	b2	1	1	1					1				1		1	1	1
	b3	1	1	1					1				1		1	1	1
	b4	1	1	1					1				1		1	1	1
Applied	c1	1	1	1					1				1		1	1	1
	c2	1	1	1					1				1		1	1	1
	c3	1	1	1					1				1		1	1	1
	c4	1	1	1					1				1				1
General Tran.	d1	1	1	1					1								
	d2	1	1	1					1								1
	d3	1	1	1					1								1
	d4	1	1	1					1								
	d5								1								

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	5
Practical Exam	-	
Written Exam	Sixteenth week	35
Total		50

6- List of References

6-1 Course notes:
El. Khoreby. H., Learn, Apply and Excel, lecture notes, Modern Academy Press, 2010.

6-2 Required books

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

6-3 Recommended books:

None

6-4 Periodicals, Web sites, etc.:

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

7- Facilities Required for Teaching and Learning

- Library
- Internet

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

Modern Academy for Engineering & Technology
Basic Sciences Department

B202: History of Science & Technology
Course Specifications

A- Affiliation

Relevant programs:
Computer Engineering & Information Technology BSc Program
Electronic Engineering & communication Technology BSc Program
Manufacturing Engineering & Production Technology BSc Program

Departments offering the programs:
Computer Engineering & Information Technology Department
Electronic Engineering & communication Technology department
Manufacturing Engineering & Production Technology Department

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

B - Basic Information

Title: History of Science & Technology **Code:** B202 **Year/level:** 2-nd year / 2-nd Term
Teaching Hours: **Lectures:** 2 **Tutorial:** --
Practical: -- **Total:** 2

C - Professional Information

1 – Course Learning Objectives

يعطى المنهج دراسة مختصره عن تاريخ الهندسة والتكنولوجيا فى مختلف العصور الفرق بين كل من العلم – الهندسة – التكنولوجيا – نقل التكنولوجيا – نشاطات العمل الهندسى ومسئوليات المهندس- امثله عن تطور اوجه النشاط الهندسى والتكنولوجى وكذا اشهر علماء الهندسة والتكنولوجيا.

2 - Intended Learning Outcomes (ILOS)

By the end of the course the student should acquire the following knowledge and understanding

المعلومات التاريخية عن مهنه الهندسة والتكنولوجيا وكذا العلاقة بين مسمى المعهد او الكلية وبين ما يتم دراسته - المام الطالب بماهيه التعليم الهندسى ومجالات العمل للمهندسين وكيفيه القيد والتسجيل بنقابه المهندسين وكذا حقوق وواجبات المهندس.

A - Knowledge and understanding

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

a1- مفهوم العلم و الهندسة والتكنولوجيا و علاقتهم ببعضهم البعض و كيفية ابتكار معدات و منظومات تحقق احتياجات المجتمع طبقا لتلك المفاهيم (A1, A11, A14)

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

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

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

B - Intellectual skills

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

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

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

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

b4- ان يستطيع الطالب اتخاذ القرار السليم و اختيار انسب الحلول من خلال دراسته لنماذج و امثلة من المشاكل الهندسيه و عرض الحلول الممكنه لها

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

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

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

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d4-اكساب الطالب كيفية وضع المعايير اللازمة لتكوين فريف بحثى متكامل

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
● العلم والهندسة والتكنولوجيا	2
● الهندسة والبحث العلمى – منظومه البحث العلمى	2
● عناصر ومتطلبات البحث العلمى	2
● الهندسة وخريطة البحث العلمى – مراحل البحث العلمى	2
● تاريخ الهندسة والتكنولوجيا فى مختلف العصور	4
● نقل التكنولوجيا	2
● نشاطات العمل الهندسى ومسئوليات المهندس	2
● التعليم الهندسى	2
● نقابه المهندسين المصرية – جمعيه المهندسين المصرية	4
● تطور اوجه النشاط الهندسى والتكنولوجى	4
● اشهر علماء الهندسة والتكنولوجيا	2
● مراجعه عامة	2
Total hours	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory &	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1	1		1		1					1	1	1	1	1
	a2	1	1	1		1		1						1	1	1	1
	a3	1	1	1		1		1					1	1	1	1	1
	a4	1	1	1		1		1						1	1	1	1
Intellectual	b1	1						1						1	1		1
	b2	1						1						1	1		1
	b3	1						1						1	1		1
	b4	1						1							1		
Prof.	C1	1						1								1	
Gener.	d1							1									
	d2							1									

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	5
Mid-Term Exam	6-th Week	10
Practical Exam	-	-
Written Exam	Sixteenth week	35
Total		50

6- List of References

6-1 Course notes

S. R. Goda, History of Science and Technology, Lecture notes, Modern Academy Press, 2010.

6-2 Required books

Martin, M. W., and Schinzinger, R., Ethics in engineering, third edition, McGraw Hill book company, New York, 4th edition, 2004.

6-3 Recommended books

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

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

مواقع الانترنت الخاصة بنقابه المهندسين المصرية

7- Facilities Required for Teaching and Learning

- كتب ومجلات ثقافية خاصة بالهندسة والمهندسين
- Computer
- Data show
- Library and Internet

Course coordinator: Dr Marwa Mohamed Fouad
Head of the Department: Professor Dr Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B211: Mathematics III
Course Specifications

A- Affiliation
Relevant programs: Manufacturing Engineering and Production Technology BSc Program
Electronic Engineering and Communication Technology BSc Program
Computer Engineering and Information Technology BSc Program

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

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

B - Basic Information
Title: Mathematics III   **Code:** B211   **Year/level:** 2-nd year / 1-st Term
Teaching Hours: **Lectures: 4**   **Tutorial: 2**
                                            Practical: --   **Total: 6**

C - Professional Information

1 – Course Learning Objectives
A study of this course aims to realize the basic concepts in ordinary differential equations (O.D.E) and methods of solution and to realize the basic concepts in functions of two or more independent variables and its partial derivative with 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- classification of O.D.E. (A1)
a2- solution of the O.D.E using suitable methods.(A1,A5)
a3- modeling physical, Mechanical, Engineering problem to O.D.E. and solve it. (A1,A5)
a4- applications of partial derivatives to physical and Engineering problems.(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 applications of partial derivatives to Engineering problems. (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)

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

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours
• Classification of Differential equations	4	2
• First order Differential Equation	4	2
• Separable and homogeneous Differential equations	4	2
• Exact and linear Equations	4	2
• N^{th} order D.E with constant coefficients	4	2
• Variation of parameters-Undetermined coefficients	4	2
• Euler's Equation-Reduction of order	4	2
• Linear systems of ordinary differential equations	4	2
• Partial derivatives- directional derivative	6	2
• Total derivatives-directional derivative	6	2
• Tangent planes and normal lines	4	2
• Maxima and minima of function of two variables	4	2
• Lagrange's multipliers	4	2
• Series solution of O.D.E.	4	4
Total hours	**60**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1	1											1
	a2	1		1	1	1			1				1		1		1
	a3	1		1	1	1			1				1		1		1
	a4	1		1	1	1											1
Intellectu	b1	1		1		1							1		1		1
	b2	1		1		1							1		1		1
Applied	c1	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	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:
Essawi, A. M. (2011) Differential Equations, Lecture Notes, Cairo: MAM Press

Essawi, A. M. (2011) Advanced Calculus (Part 1), Lecture Notes, Cairo: MAM Press

6-2 Required books

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

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

7- Facilities Required for Teaching and Learning

- Library
- Internet

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

Modern Academy for Engineering & Technology
Basic Sciences Department

B212: Mathematics IV
Course Specifications

A- Affiliation

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

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

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

B - Basic Information

Title: Mathematics IV   **Code:** B212   **Year/level:** 2-nd year / 2-nd Term
Teaching Hours: **Lectures:** 4   **Tutorial:** 2
                                 Practical: --   **Total:** 6

C - Professional Information

1 – Course Learning Objectives

A study of this course aims to realize the basic concepts in Laplace transform and special functions and Fourier series and to use the Laplace transform to solve O.D.E., integral equations to use double and trible integrals to integrate function of severed variables in different coordinates

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- rules of Laplace transform and its inverse in applications.(A1,A2,A5)
a2- definitions of the special functions and its application. (A1,A5)
a3- fourier series and its applications in applied engineering problems. (A1,A2,A5)
a4- multiple integration in applications.(A1,A5)
a5- uses of vector calculus analysis in applications. (A1)

B - Intellectual skills

On successful completion of the course, the student should be able to.
b1- apply rules of Laplace transform and its inverse to Solve O.D.E and integral equations. (B1, B2, B3, B7)
b2- choose the right decision by choosing the best kind of multiple Integration in applications. (B1, B2, B3)
b3- use vector analysis to evaluate line integrals and surface integrals for a vector function. (B2)
b4- make analysis for electrical problem using Fourier series. (B1, B2)

C - Professional and practical skills

On successful completion of the course, the student should be able to:
c1- apply Laplace transform in electrical and mechanical problem. (C1, C12)
c2- apply Fourier series in electrical and mechanical problem. (C1, C12)
c3- apply multiple Integration in electronics. (C1, C12)
c4- apply vector analysis to find the work done by the force field in electrical problem. (C1, C12)

D - General and transferable skills

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

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, 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
• The Gamma and Beta function	4	2
• Laplace transform	2	2
• First shift theorem - Second shift theorem	4	2
• Differentiation and integration of Laplace transform	2	2
• Laplace transform of derivative and Integral	2	2
• Convolution theorem and applications of Laplace transform	4	2
• Fourier series and its applications	4	2
• Legendre functions and Legendre O.D.E.	4	2
• Bessel functions and Bessel O.D.E.	4	2
• Double and triple integrals with applications	6	2
• Polar, Cylindrical and spherical coordinates in multiple integrals with applications	6	2
• Line integrals and applications and Green's theorem	6	2
• Surface area and surface integrals with applications	4	2
• Divergence Theorem	4	2
• Stokes Theorem	4	2
Total hours	**60**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method				
		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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
	a4	1		1	1	1			1				1		1		1
	a5	1		1	1	1							1		1		1
Intellectual	b1	1		1	1	1							1		1		1
	b2	1		1	1	1							1		1		1
	b3	1		1	1	1		1					1		1		1
	b4	1		1	1	1		1					1		1		1
Applied	c1	1		1				1									
	c2	1		1		1		1									
	c3	1		1				1									
	c4	1		1				1									
Gener	d1			1				1									
	d2	1		1	1			1									1

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes:

Essawi, A. M. (2011) Laplace Transform and Special Functions, Lecture Notes, Cairo: MAM Press.

Essawi, A. M. (2011) Advanced Calculus (Part 2), Lecture Notes, Cairo: MAM Press

6-2 Required books

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

www.mathwords.com.

www.khanacademy.org/math

www.sosmath.com

7- Facilities Required for Teaching and Learning

- Library
- Internet

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

Modern Academy for Engineering & Technology
Basic Sciences Department
B300: English Language IV
Course Specifications

A- Affiliation

Relevant programs:
Computer Engineering & Information Technology BSc program
Electronic Engineering & communication Technology BSc program
Manufacturing Engineering & Production Technology BSc program

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

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

B - Basic Information

Title: English Language IV   **Code:** B300   **Year/level:** 3-rd year / 1-st Term
Teaching Hours: **Lectures: 2**   **Tutorial: --**
Practical: --   **Total: 2**

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 everyday 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 in references and in internet. (D4), (D7)
d5- Practice self-learning. (D4), (D7), (D8).

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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
• Murder, Conversation	5
• Murder, Grammar	4
• A False Charge, Conversation	5
• A False Charge, Grammar	4
• Interviewing Preparation, part 1	4
• Interviewing Preparation, part 2	4
• Writing a CV/Resume'	4
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	Laboratory & Experiments	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	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	1
	a3	1	1	1					1				1		1	1	1
Intellectual	b1	1	1	1					1				1		1	1	1
	b2	1	1	1					1				1		1	1	1
	b3	1	1	1					1				1		1	1	1
	b4	1	1	1					1				1		1	1	1
Applied	c1	1	1	1					1				1		1	1	1
	c2	1	1	1					1				1		1	1	1
	c3	1	1	1					1				1		1	1	1
	c4	1	1	1					1				1		1	1	1
General Tran.	d1	1	1	1					1				1			1	
	d2		1	1					1							1	
	d3	1	1	1					1							1	1
	d4	1	1	1					1								
	d5								1							1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	5
Practical Exam	-	-
Written Exam	Sixteenth week	35
Total		50

6- List of References

6-1 Course notes:
El. KhoreibyA. H., Learn, Apply and Excel, lecture notes, Modern Academy Press, 2010.

6-2 Required books
   Shelton, James, Handbook for technical writing, NTC publishing Group, Illinois, USA, 1998.
6-3 Recommended books:
   Shelton, James, English for Engineering, NTC publishing Group, Illinois, USA, 2008.
6-4 Periodicals, Web sites, etc.:
- http://www.bbc.co.uk/learningenglish
- http://www.rong-chang.com/
- http://legacy.australianetwork.com/studyenglish/

7- Facilities Required for Teaching and Learning
- Dictionaries
- Internet

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

Modern Academy for Engineering & Technology
Basic Sciences Department

B311: Mathematics V
Course Specifications

A- Affiliation
Relevant program: Manufacturing Engineering & Production Technology BSc. Program
Department offering the program: Manufacturing Engineering & Production Technology Department
Department offering the course: Basic Sciences Department
Date of specifications approval: September 2015

B - Basic Information
Title: Mathematics V   **Code:** B311'   **Year/level:** 3-rd year / 1-st Term
Teaching Hours: **Lectures:** 2   **Tutorial:** 2
           Practical: --   **Total:** 4

C - Professional Information

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1. Complex numbers, D'Moiver theorem, complex and analytic functions.(A1, A5)
a2. Conformal mappings and bilinear transformation. (A1, A5)
a3. Power series and integration by integration by methods of residues. (A1, A5)
a4. Basic concepts, classification and canonical form of PDEs. (A1, A3)
a5. Method of separation of variables for heat, wave and Laplace equations. (A1, A3)
a6. Solution of PDEs using Laplace trans form. (A1, A3)

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

C - Professional and practical skills
c1. Solve partial differential equations describing real systems(C1, C12)

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

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours
Complex numbers, arithmetic operations, polar forms	2	2
D'Moiver theorem, complex functions. Analytic function	2	2
Elementary functions of complex variables	2	2
Mapping, and conformal mapping.	2	2
Bilinear transformation, complex integrals.	2	2
Power series (Taylor and Laurent series).	2	2
Integration by method of residues.	3	3
Introduction to PDEs, Basic concepts of PDEs	3	3
Classifications and conical forms of 2nd order linear PDEs.	3	3
Method of separation of variables for heat equation.	3	3
Wave and Laplace equations. D'Alembert solution of wave equation.	3	3
Solution of PDEs using Laplace transforms.	3	3
Total hours	**30**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1			1		1		1		1	1		1
	a2	1	1		1	1				1		1	1	1	1	1	
	a3	1			1	1				1		1	1	1	1		
	a4	1		1	1	1		1		1		1	1	1	1		1
	a5	1	1		1			1		1		1	1	1	1	1	
	a6	1						1		1		1	1	1	1		
Intellectual	b1																
	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	1
	b5	1			1	1				1	1		1	1	1		
	b6	1			1	1				1	1		1	1	1		
Applied	c1	1			1	1	1						1		1		1
General	d1			1		1		1					1				1
	d2		1	1				1	1				1			1	1
	d3		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	15
Mid-Term Exam	6-th Week	15
Practical Exam	-	-
Written Exam	Sixteenth week	70
Total		100

6- List of References

6-1 Course notes:

Aly M. Essawy& Dr. Mohamed A. K , Complex Analysis and partial Differential Equations, Lecture Notes, Modern Academy, 2010.

6-2 Required books

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

6-3 Recommended books:

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

6-4 Periodicals, Web sites, etc.

www.sosmath.com
www.mathworlds.com

7- Facilities Required for Teaching and Learning

- Library, Required References
- Computer & Internet

Course coordinator: Dr Ghada Salem
Head of the Department: Prof Dr Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology
Mechanical Engineering Department
B411: Mathematics VI
Course Specifications

A- Affiliation

Relevant programs: Computer Engineering & Information Technology BSc Program
Electronic Engineering & communication Technology BSc Program
Manufacturing Engineering & Production Technology BSc Program

Departments offering the programs: Mechanical Engineering & Production Technology Department
Electronic Engineering and Communication Technology Department
Computer Engineering and Information Technology Department

Department offering the course: Basic Sciences Department

Date of specifications approval: September 2015

B - Basic Information

Title: Mathematics VI   **Code:** B411   **Year/level:** 4-th year / 1-st Term

Teaching Hours: **Lectures:** 3   **Tutorial:** 2

Practical: --   **Total:** 5

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

By the end of the course the student should be able to:
c1- Identify appropriate economic modles (C1).
c2- Use appropriate IT packages effectively (C4).

D - General and transferable skills

By the end of the course the student should be able to:
d1- Write technical reports
d2- Communicate effectively.
d3- Communicate using E-mail.
d4- Search for information from internet.

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A5
B	Intellectual skills	B1, B2, B3, B11
C	Professional and practical skills	C1, C4
D	General and transferable skills	D3, D4, D7

3 – Contents

Topic	Lecture hours	Tutorial hours
➢ Curve fitting and linear Approximation of a function.	6	4
➢ Interpolation		
• polynomial interpolation and error estimation in the interpolation formula Lagrange interpolation	3	2
• Newton –interpolation	3	2
• Hermite interpolation.	3	2
➢ Numerical Integration		
• Newton-Cotes formula, composite Newton-cotes formula	3	2
• Romberg – steifel integration method.	3	2
➢ Numerical solution of initial value problems	3	2
• numerical solution of first order methods Runge- Kutta methods	6	4
• multistep methods .	3	2
➢ Numerical solution of linear and non-linear equation, Gauss-Seidel method.	6	4
➢ Numerical solution of nonlinear equations the fixed point iteration method, Newton-Raphson method.	6	4
Total hours	**45**	**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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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		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
Applie Intellectu	b1	1		1	1	1							1		1		1
	b2	1			1	1			1				1		1		1
	b3	1		1	1				1				1		1		1
	c1	1											1				
	c2	1											1				
General	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: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	20
Practical Exam	-	-
Written Exam	Sixteenth week	70
Total		100

6- List of References

6-1 Course notes

Osama El-Gayar Methods for Engineers, Modern Academy Press, Lecture Note, 2005.

6-2 Required books:

- Richavd L.Brude "Numerical Analysis",4th ed., Mc Graw Hill, 1995.
- Amir Wadi Al-khafaji ,John R.Tooley "Numerical methods in Engineering Practice", U.S.A. 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: Dr. Nabela El-sawey
Head of the Department: Prof.Dr. Laila Soliman
Date: Septemper, 2015

Modern Academy for Engineering & Technology
Basic Sciences Department
B512: Laws and Regulations for Engineers
Course Specifications

A- Affiliation

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

Departments offering the programs: Mechanical Engineering & Production Technology Department
                                  Electronic Engineering and Communication Technology Department
                                  Computer Engineering and Information Technology Department

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

B - Basic Information

Title: Laws & Regulation for Engineers   **Code:** B512   **Year/level:** 5-th year / 2-nd Term
Teaching Hours: **Lectures: 3**   **Tutorial: --**
                                              Practical: --   **Total: 3**

C - Professional Information

1 – Course Learning Objectives

مع نهاية هذا المقرر يكون الطالب قد تمكن من فهم وتحليل وتطبيق المصــطلحات والمفاهيم القانونية و التشـــريعات الصــناعية المصـــرية - قوانين وتشـريعات اعمال البناء والتخطيط العمرانى و قوانين وتشريعات بيئية لحماية البيئة المصرية و المناقصـات والعطاءات - قانون تنظيم المناقصـات 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 القانونية (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)

D - General and transferable skills

On successful completion of the course, the student should be able to:
d1- Work in a team and involve in group discussion(D1, D3).
d2- Search for information's in references and in internet (D7).
d3- Practice self-learning (D7, D9).

Course Contribution in the Program ILO's

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

3 – Contents

Topic	Lecture hours	Tutorial hours
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	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	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	b1																
	b2	1											1		1		1
	b3	1				1							1		1		1
	b4	1	1	1					1				1				
Prof.	C1	1	1						1						1		1
General	d1																
	d2																
	d3	1		1		1											

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	5
Practical Exam	-	-
Written Exam	Sixteenth week	35
Total		50

6- List of References
6-1 Course notes
د شعبان رجب جودة ، قوانين وتشريعات هندسيه، الأكاديمية الحديثه للهندسة و التكنولوجيا، ٢٠١٠.
6-2 Required books
6-3 Recommended books
جمال الدين احمد نصار، محمد ماجد خلوصى، قانون وتشريعات وعقود الاتحاد الدولى للمهندسين الاستشاريين، القاهرة، ٢٠٠٨:
6-4 Periodicals, Web sites, etc.
www.alamiria.com

7- Facilities Required for Teaching and Learning
- Library
- Internet

Course coordinator: Dr. Ghada Salem
Head of the Department: Prof. Dr. Laila Soliman
Date: September 2015

Modern Academy for Engineering & Technology
Basic Sciences Department

B572: Pollution and Society
Course Specifications

A- Affiliation
Relevant program: Manufacturing Engineering & Production Technology BSc. program
Department offering the program: Manufacturing Engineering & Production Technology Dept.
Department offering the course: Basic Sciences Department
Date of specifications approval: September 2015

B - Basic Information

Title: Pollution and Society   **Code:** B572   **Year/level:** 5-th year / 2-nd Term
Teaching Hours: **Lectures:** 2   **Tutorial:** --
    Practical: --   **Total: 2**

C - Professional Information

1 – Course Learning Objectives
By the end of this course the students should be able to gain, analyze and apply the knowledge and understanding of basic biogeochemical cycles, the role of certain groups of living organisms in pollution control and the basic concept of air and water pollution and pollutants.

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 environmental pollution (A9,A10)
a2- the major sources of environmental pollution (A9)
a3- the effect of air and water pollution(A9,A10)
a4- the practice of noise control.(A10)
a5- the process in manage solid waste in order to minimize their effect.(A9,A10)
a6- the major approaches to the prevention of pollution from the most common sources(A9,A10).
a7- preliminary Environment Impact Assessment for a development.(A10)

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.(B4,B9)
b2- Analyze and give information on the basic causes of environmental disturbances. (B9.B10,B12)
b3- Use the basic scientific knowledge in understanding the nature of environmental problems and be able to quantify them. (B9,B10)

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 nature resources. (C1)

D - General and transferable skills
By the end of the course the student should be able to:
d1-Communicate effectively. (D1, D3)

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
D	General and transferable skills	D1, D3

3 – Contents

Topic	Lecture hours	Tutorial 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	Laboratory & Experiments	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1	1					1				1		1		
	a2	1				1							1		1		1
	a3	1	1	1									1		1		1
	a4	1	1			1			1								
	a5	1											1		1		1
	a6	1	1			1			1								
	a7	1		1		1			1				1		1		1
Intellectu	b1	1											1		1		1
	b2	1				1							1		1		1
	b3	1	1	1					1				1				
Prof.	c1	1	1						1				1				
General	d1	1		1		1			1								

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	5
Mid-Term Exam	6-th Week	10
Practical Exam	-	-
Written Exam	Sixteenth week	35
Total		50

6- List of References

6.1 Course notes

M. Abou taleb, Pollution and Society, Lecture notes, Modern Academy Press, 2010.

6-2 Required books:

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

6-3 Recommended books

None

6-4 Periodicals, Web sites, etc.

http:www.epa.gov

http:www. Eeao. Gov. eg

7- Facilities Required for Teaching and Learning

- Computer
- Data show
- Library and Internet

Course coordinator:	Dr Marwa Mohamed Fouad
Head of the Department:	Professor Dr Laila Soliman
Date:	September 2015

Modern Academy for Engineering & Technology
Electronic Engineering and Communication Technology Department

E030: Electric & Electronic Circuits
Course Specifications

A- Affiliation

Relevant programs: Manufacturing Engineering & Production Technology BSc. program

Departments offering the programs: Manufacturing Engineering & Production Technology Department

Department offering the course: Electronic Engineering and Communication Technology Department
Date of specifications approval: September 2015

B - Basic Information

Title: Electric and Electronic Circuits   **Code:** E030   **Year/level:** 3-rd year / 1-st Term
Teaching Hours: **Lectures: 4**   **Tutorial: 1**
                                             Practical: 1   **Total: 6**

C - Professional Information

1 – Course Learning Objectives

This course is introduction to Industrial engineering students to learn Electric and Electronic basics which can be used in their future engineering practice. it concerns general exposure to integrated electric and mechanical applications, mechatronics and general exposure to domestic machines.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should be gain the following knowledge:
  a1- Basics of electricity, current, voltage and everyday use of electric and electronic concepts (A1, A8)
  a2- The electric components, resistors, capacitors, inductors, diodes, transistors and basic integrated circuits (A4, A8, A15)
  a3- Applications for resistors, (especially the strain gauges), capacitors and inductors, in flash light, ignition of combustion engines and accurate measurements of linear distances (A13, A14)
  a4- The handling of electric circuits using Kirchhoff's rules for currents and voltages (A4)
  a5- Applications related to two and four port networks, with applications of Thevinin and Norton concepts (A5, A8)
  a6- The rules of alternating current (AC) applications in circuits, the Root Mean Square and the average of electric quantities (A13, A15)
  a7- Handling of ideal inductive electricity and transformers (A4)
  a8- Brief three phase handlings (A4, A5)
  a9- Basics of insulators, conductors and semi-conductors (A8)
  a10- Junctions semiconductors in basic diode uni-current direction diodes (A13)
  a11- Bipolar Junction Transistor use in amplifiers (A15)
  a12- Use of Field Effect Transistors in circuits (A15, A23)

B - Intellectual skills
By the end of the course the student should be able to:
        b1- Analyze electric circuits using KCL and KVL (B3, B4)
        b2- Identify Thevinin voltage and Norton current sources (B7)
        b3- Select equipment to measure currents, voltages and resistances (B2)
        b4- Identify resistors and capacitors color codes (B4)
        b5- Select resistors capacitors and inductors in practical specific applications (B1, B2)

C - Professional and practical skills
By the end of the course the student should be able to:

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    c1- Use of strain gauges (C1, C2)

    c2- Use of diodes in practical rectifiers to generate DC from AC electricity (C2, C3)

    c3- Use the simple transistor amplifiers and Operational Amplifiers (C8)

D - General and transferable skills

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

    d1-Demonstrate efficient ICT capabilities (D4)

    d2- Search for information and engage in life-long self-learning discipline (D6)

    d3- Refer to relevant literatures (D9)

    d4- Communicate effectively in written form (D1, D2)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4, A5, A8, A13, A14, A15
B	Intellectual skills	B1, B2, B3, B4, B7
C	Professional and practical skills	C1, C2, C3, C8
D	General and transferable skills	D1, D2, D4, D6, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction, basic definitions currents, voltages, resistances, capacitances and inductances	6	1	3
• Mathematical handling of circuits	6	1	3
• Use of KCL and KVL for handling of electric circuits	6	1	3
• Handling of measurements of resistances using Wheatstone bridges	4	1	3
• Applications of inductors, resistors and capacitors in practical applications	4	1	3
• Time domain analysis			
• Transient response of proportional, integrating and first order equations.	4	1	
• Transient response of second order elements. Effect of location of roots of characteristic equation on the transient response	4	1	
• Presentation of mechanical systems with electric circuit elements	4	1	
• Friction with resistors	4	1	
• Mass with inductors	3	1	
• Spring constants with capacitors	3	1	
• Speed handling	3	1	
• Acceleration handling	3	1	
* distance handling	3	1	
• Frequency response	3	1	
Total hours	**60**	**15**	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
		Teaching Methods							Learning Methods				Assessment Method				
Knowledge	a1	1		1	1	1	1		1	1			1	1	1		1
	a2	1	1	1	1	1	1		1	1			1	1	1	1	
	a3	1	1	1	1	1	1	1		1			1	1	1		
	a4	1	1	1	1	1	1		1	1			1	1		1	
	a5	1	1		1	1	1			1			1	1	1		1
	a6	1	1	1	1	1		1	1				1		1		1
	a7	1	1		1	1		1					1		1		
	a8	1	1	1	1	1			1				1		1	1	
	a9	1		1		1	1	1	1	1			1	1		1	
	a10	1		1		1	1			1			1	1			1
	a11	1		1	1	1	1		1				1	1			1
	a12	1			1	1	1		1	1			1	1			1
Intellectual	b1	1		1	1	1	1			1			1	1	1		1
	b2	1		1	1	1	1						1	1	1	1	
	b3	1				1	1	1	1				1	1			1
	b4	1				1	1		1					1			1
	b5	1					1							1			1
Professio	c1	1			1	1		1					1		1		1
	c2	1	1		1	1	1			1			1	1			1
	c3	1		1	1								1	1	1		1
General	d1	1	1	1		1	1									1	1
	d2	1		1		1	1		1							1	1
	d3	1	1	1			1									1	
	d4	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	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes
Academy Printed Notes and Laboratory Books
Printed weekly exercises and handouts
White board lectures and Section Explanations

6-2 Text book References
Allan Hambley, Electrical Engineering, Principles and Applications, Prentice Hall, 2002.

6-3 Recommended books

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

6-4 Periodicals, Web sites, etc.

IEEE Spectrum,

7- Facilities Required for Teaching and Learning

- Electric Circuits Laboratory.
- Computer, Data show and Computer programs; MATLAB

Course Coordinator: Prof. Mostafa AFIFI
Head of the Department: Dr Mokhtar Abdulhalim
Date: September 2015

Modern Academy for Engineering & Technology
Computer Engineering and Information Technology Department

E050: Electrical Power Systems
Course Specifications

A- Affiliation
Relevant program: Manufacturing Engineering & Production Technology BSc. program
Department offering the program: Manufacturing Engineering and Production Technology Department
Department offering the course: Computer Engineering and Information Technology Department
Date of specifications approval: September 2015

B - Basic information
Title: Electrical Power Technology **Code:E050** **Year/level:** 3rd / 2nd
Teaching Hours: **Lectures: 3** **Tutorial: 1**
 Practical: 1 **Total:5**

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 applications the 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:
By the end of this course the student should acquire the following knowledge and understanding:
a1- Construction of machines (transformers – motors – generators). (A1, A3, A16)
a2- Different kinds of machines and transformers. (A1, A14, A16)
a3- Theory of operation of all kinds of machines. (A1, A5, A18)
a4- Applications of different kinds of machines. (A3, A5)
a5- Electrical power system. (A3, A8, A12)
a6- Types and construction of electrical underground cables. (A3, A8, A18)

B - Intellectual skills:
On successful completion of the course, the student should be able to:
b1- Find the equivalent circuits of any machine type. (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 the efficiency of transformers and machines. (B2)
b6-Design a simple transformer. (B3)

C - Professional and practical skills:
By the end of the course the student should be able to:
c1- Operate all kinds of machines. (C1, C5)
c2- Test all machines and transformers. (C2, C7, C16)
c3- Measure the efficiency of any machine or transformer. (C5, C7)
c4- Assemble and disassemble machine parts**.** (C1, C2)

D - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- Communicate effectivity through assignment (D3).
d2- Work in stressful environment and within constraints (D2).
d3- Effectively manage tasks, time, and resources (D6).
d4-Search for information and engage in life-long self-learning discipline (D7).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A5, A8, A12, A14, A16, A18
B	Intellectual skills	B2, B3, B6, B9, B11
C	Professional and practical skills	C1, C2, C5, C7, C16
D	General and transferable skills	D2, D3, D6, D7

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Circuit analysis of transformers	5	1	-
• Transformer construction	2	-	2
• Equivalent circuit of a transformer	4	2	-
• Transformer test	3	1	2
• Construction of dc machines	3	-	-
• Classification of dc machines	3	1	2
• Circuit equations of dc machines	3	2	-
• DC machine efficiency	3	1	2
• Construction of induction motors	3	-	-
• Torque-speed characteristics	4	2	2
• Efficiency of induction motors	3	2	3
• Circuit equations of synchronous machines	3	1	-
• Construction of synch machines	3	1	-
• Operation of synch machines	3	1	2
Total hours	**45**	**15**	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations and Discussions	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Written Exam	Practical Exam	Quizes	Term papers	Assignments
Knowledge & Understanding	a1	1	1						1		1		
	a2	1	1		1	1			1		1		1
	a3	1				1			1	1	1		1
	a4	1	1		1	1			1	1	1		1
	a5	1	1						1				
	a6	1	1						1	1			1
Intellectual Skills	b1	1			1	1				1			
	b2	1					1						
	b3	1				1				1			
	b4	1				1				1			
	b5	1				1			1	1			
	b6				1	1					1		
Applied Professional Skill	c1				1					1			
	c2				1					1			
	c3				1					1			
	c4				1					1			
General Tran. Skills	d1	1		1									1
	d2				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 Essential books (text books)
A.E. Fitzgerald,and S. D. Umans, Electrical Machinery, McGraw-Hill, sixth Edition , 2010
6-3 Recommended books

6-4 Periodicals, Web sites, etc.: Non
- http://www.slideshare.net/jayleong111/electrical-machines-drives-and-power-systems.
- http://www.amazon.com/Electrical-Machines-Drives-Systems-Edition/dp/0131776916.

7- Facilities required for teaching and learning:
Electrical Machines Lab.

Data show

Course coordinator: Dr. Said A. Gawish.

Dr. Haytham Gamal.

Head of the Department: Dr. Mokhtar Abd El- Haleem.

Date: September 2015.

Modern Academy for Engineering & Technology
Electronic Engineering and Communication Technology Department

E051: Signal Processing
Course Specifications

A- Affiliation

Relevant program:	Manufacturing Engineering & Production Technology BSc. program
Departments Offering the Programs	Manufacturing Engineering & Production Technology Dept.
Department Offering the Course:	Electronic Engineering & communication Technology Dept..
Date of Specification Approval:	September 2015

B - Basic information

Title: Electronic Signal Processing **Code:** E051 **Year/level:** 4th Year
Teaching Hours: **Lectures:** 3 **Tutorial:** 2
 Practical: 1 **Total: 6**

C- Professional Information

1. Course Learning Objectives:
The course aims at qualifying the applicants in the following topics:
- Definition of Analog and Digital Signals.
- Fourier series and Fourier Transform Analysis.
- Signal Amplifications Using the BJT, FETs and Operational Amplifiers.
- Filtering Circuits, Analog to Digital and Digital to Analog Conversion.
- Numbering and Binary Mathematics.
- Boolean algebra and Logic Gates.
- Combinational Logic Circuits Applications.
- Sequential Logic Circuits.
- Processing Programmable Circuits.

2. Intended Learning Outcomes (ILOS):

A – Knowledge and understanding
By the end of this course the student should acquire the following knowledge and understanding:
a1- General Understanding of the Signal Processing Requirements (A1, A3, A8)
a2- Understanding the Analog to Digital and Digital to Analog Applications (A2, A8, A19)
a3- Electric Circuits Equivalence to Mechanical Systems (A12, A16)
a4- Amplification Circuits Using the BJT, FETs and Op Amps (A8, A15)
a5- The Binary numbering and Data Handling of Computers (A5, A19, A24)
a6- The use of Combinational Logic Circuits in Processing (A8, A15)
a7- Sequential Circuit Applications and Logic Programming (A15)

B – Intellectual skills
By the end of the course the student should be able to:
b1- Develop imaginative and Signal Processing Skills (B1, B4)
b2- Applications for quantization of analog levels to digital codes (B11, B15)
b3- Band width control using general filtering (B5)
b4- Combinational logic circuit applications to help RISC computation (B2, B16)
b5- Translation of practical conditional control to logic formulation (B7)
b6- Sequential logic application (B12)

C – Professional and practical skills
By the end of the course the student should be able to:

c1- Lab application for Analog to Digital (A/D) and digital to Analog (D/A) conversion (C5, C6, C14)

c2- Design and application of signal generation and logic circuits (C5)

c3- Identification of Electronic components (C2)

c4- Familiarity with recent processing tools and control designs (C1, C17)

D – General and transferable skills

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

d1- Practicality of Amplification circuits (D1, D4)

d2- Practicality of the signal generating circuits (D5)

d3- Practicality of using diode and transistor circuits (D6)

d4- Practicality of recent processing tools of LabVIEW (D7, D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A5, A8, A12, A15, A16, A19, A24
B	Professional and practical skills	B1, B2,B4, B5, B7, B11, B12, B15, B16
C	Intellectual skills	C1, C2, C5, C6, C14, C17
D	General and transferable skills	D1, D4, D5, D6, D7, D8

3- Course Contents:

Topic	Lecture Hours	Tutorial hours	Practice hours
Signals, Systems and signal Processing	3	2	
Classification of Signals	3	-	-
The frequency in continuous and discreet time	3	2	3
Analog to Digital and Digital to Analog conversion	3	-	3
Fourier Series (FS) and Fourier transform (FT)	5	2	3
Discreet Fourier Transform (DFT)	4	3	-
Logic circuits and Boolean equations	4	3	-
Amplification Op Amps and transistor circuits	4	3	2
Half and full adders	3	3	-
Digital filtering and time series applications with LabVIEW	4	3	2
Logic Expressions and the Karnaugh Maps	3	3	-
Converters and code transformation	3	3	-
Multi-vibrators	3	3	2
Total hours	**45**	**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	Laboratory & Experiments	Projects	Researches	Modeling and	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1	1	1	1	1	1						1	1	1		1
	a2	1		1	1	1	1		1				1	1			1
	a3	1		1	1	1			1				1	1	1		1
	a4	1			1	1	1	1					1	1	1		1
	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	
Int	b1	1			1	1			1				1			1	

	b2	1			1	1						1			1	
	b3	1			1	1						1		1		
	b4	1		1	1	1						1		1		1
	b5	1		1	1	1				1		1		1		1
	b6	1			1	1				1		1		1		
Applied	c1	1			1	1	1	1		1		1	1	1		1
Applied	c2	1	1	1	1	1						1		1		1
Applied	c3	1	1	1	1			1			1		1			
General Tran.	d1	1			1	1						1				1
General Tran.	d2	1		1	1							1	1		1	
General Tran.	d3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
General Tran.	d4	1	1	1	1	1		1		1	1	1	1	1	1		1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of references:
6-1 Course notes
- Academy printed Notes and Laboratory books
- Printed weekly exercises and handouts
- Whiteboard lecture and section explanations

6-2 Essential books (text books)
John G. Proakis and Dimitris G Manolkis, "Digital Signal Processing; Principals, Algorithms and Applications", 3rd Edition, Macmillan Publishing Company, 1992.

6-3 Recommended books
Ashok Ambardar, "Analog and Digital Signal Processing", 2nd Edition, Brooks/Cole Publishing Company, 1999.

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

7- Facilities required for teaching and learning:
Electronic Circuits and Computer Laboratories
Lecture Halls
Section Classes

Course coordinator: Prof. Dr. Eng.Mostafa S. Afifi
Head of the Department: Dr. Mokhtar Abdulhalim
Date: November 2011

Modern Academy for Engineering & Technology
Computer Engineering and Information Technology Department
Course Specification
E111: Introduction to Computers I

A- Affiliation

Relevant programs:
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

Departments offering the program:
Electronic Engineering and Communications Technology Dept.
Computer Engineering and Information Technology Dept.
Architecture Engineering and Building Technology Dept.
Manufacturing Engineering and Production Technology Dept.

Department offering the course: Computer Engineering and Information Technology Dept.
Date of specifications approval: September 2015

B- Basic information

Title: Introduction To Computers (I) **Code:** E111 **Year/level:** 1st year- 1st semester
Teaching Hours: **Lectures:** 2 **Tutorials:** -
 Practical:2 **Total: 4**

C - Professional information

1. Course Learning Objectives:
A study of this course will enable the student to:
- Appreciate the importance of computer and inf. technology in modern life
- Be familiar with computer applications and their categories
- Distinguish between various categories of computer software
- Identify various computer components
- Gain confidence in using computers to edit and format texts
- Change the defaults settings in computer display and file and folder management

2. Intended Learning Outcomes (ILOS):

A – Knowledge and understanding
By the end of this course the student should acquire the following knowledge and understanding:
a1- Identification of different computer components and different computer, types(A14)
a2- different operating systems.(A13)
a3- advantages and disadvantages of computers.(A12, A14)
a4- Identification of different types of text editors (A7)
a5- procedures of running and closing programs (A18)
a6- input and output devices (A13)
a7- numbering systems (A4)

B – Intellectual skills
By the end of the course the student should be able to:
b1- Analyze and decide the reasons behind simple computer problems(B2,B3)
b2- Troubleshoot simple problems encountered during running application programs (B6)
b3- Differentiate between operating system features (B13)
b4- Transfer from a numbering system to another (B1 ,B2)
b5- Add, Subtract, and Multiplying binary numbers (B1 ,B2)
b6- Transfer fractions from binary to decimal and vice versa.(B11 ,B12)

C – Professional and practical skills
By the end of the course the student should be able to:
c1- Carry out full tasks using computer programs(C5)

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c2- Navigate from program to another.(C14 , C16)

c3- Handle open windows in multi-window operating environment.(C14)

D – General and transferable skills

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

d1- Communicate effectively in written form(D1 ,D3)

d2- Demonstrate efficient IT capabilities.(D4)

d3- 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	A4, A7 , A12 , A13 , A14 , A18
B	Intellectual skills	B1 , B2 ,B3 , B6, B11, B12, B13
C	Professional and practical skills	C5 , C14 , C16
D	General and transferable skills	D1 , D3 ,D4 ,D7

3- Course Contents:

Topics	Lecture hours	Tutorial hours	Practical hours
• Historical overview	2	-	
• Types of computers	2	-	4
• Indices of computer performance	6	-	
• Computer components	4	-	4
• Storage media	4	-	
• Numbering systems	2	-	
• Binary arithmetic	4	-	
• DOS operating system and commands	4	-	4
• Windows Operating System	2		8
• Text Editing			10
Total hours	**30**	**-**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Site Visits	Quizzes & Presentations	Assignments	Written Exam	Practical Exam
Knowledge	a1	1	1										1	
	a2	1										1	1	
	a3	1	1										1	
	a4	1											1	
	a5	1					1						1	
	a6	1												
	a7	1		1		1		1				1	1	
Intellectual	b1	1		1									1	
	b2	1		1									1	
	b3	1											1	
	b4	1										1	1	
	b5	1										1	1	
	b6	1										1	1	
Applied	c1		1				1				1			1
	c2		1				1							1
	c3		1				1							1

General Tran	d1		1					1			1			
	d2		1					1						
	d3		1					1						

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	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
- Lecture and lab notes

6-2 Essential books (text books)
Gale E., Introduction to Micro-computing, Newell,1991.

Peter Norton's. Introduction to computers, Fifth edition , Student Edition, 2002

David Reed . A Balanced Introduction to computer Science, Prentice hall , 2004

6-3 Recommended books
Non

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

7- Facilities required for teaching and learning:
Computer Lab

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

Modern Academy for Engineering & Technology
Computer Engineering and Information Technology Department
Course Specification
E112: Introduction to Computers II

A- Affiliation

Relevant programs:
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

Departments offering the program:
Electronic Engineering and Communications Technology Dept.
Computer Engineering and Information Technology Dept.
Architecture Engineering and Building Technology Dept.
Manufacturing Engineering and Production Technology Dept

Department offering the course: Computer Engineering and Information Technology Dept

Date of specifications approval: September 2015

B- Basic information

Title: Introduction To Computers (II)   **Code:** E112   **Year/level:** 1st year- 2nd semester

Teaching Hours: **Lectures:** 2   **Tutorials:** -

Practical: 2   **Total: 4**

C - Professional information

1. Course Learning Objectives:

A study of this course will enable the student to understand the concepts of information system, files and databases and to understand the concepts of programming and to use spread sheet programs to produce tables and graphs.

2. Intended Learning Outcomes (ILOS):

A – Knowledge and understanding
By the end of this course the student should acquire the following knowledge and understanding:
- a1- the differentiate between application and system software (A15)
- a2- the concepts of information technology (A2)
- a3- the different communications channels (A2 , A17)
- a4- how to build a good database (A5)
- a5- the different methods and languages to develop a program (A18)
- a6- how to Use Word processors to edit, format and print texts (A7)
- a7- how to Use spread sheets in the form of tables with intensive formula cells (A7)
- a8- Know how to Use simple databases using common Data Base Management System (A5)

B – Intellectual skills
By the end of the course the student should be able to:
- b1- Design format specifications for texts.(B12)
- b2- Construct and implement formulas from given requirements (B11)
- b3- Allocate data tables and relationships between them (B1)
- b4- Design simple program specifications (B1,B2)
- b5- Develop computer programs.

C – Professional and practical skills
By the end of the course the student should be able to:
- c1- Create and run simple database programs (C17)
- c2- Create spread sheets with heavy calculation tasks (C14)
- c3- Write and print formatted texts (C14 , C16)
- c4- Write and execute computer programs.(C15)

D – General and transferable skills

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

d1- Communicate effectively in written form (D1 ,D3)

d2- Demonstrate efficient IT capabilities.(D4)

d3- 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	A2, A5, A7, A15, A17, A18
B	Intellectual skills	B1, B2 ,B11 ,B12
C	Professional and practical skills	C14 ,C15 ,C16 ,C17
D	General and transferable skills	D1,D3 ,D4 ,D7

3- Course Contents:

Topic	Lecture hours	Tutorial hours	Practical hours
• Information technology	2		
• Communications	2		
• Files and databases	2		
• Computer languages (HLL, LLL)	6	-	
• Compilers	2	-	
• Operating systems (types and functions)	4	-	
• Application software (Word Processing)	2	-	2
• Application software (Spread Sheets)	2	-	10
• Application software (Files and Databases)	2	-	6
• Introduction to programming	6		12
Total hours	**30**	**-**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and	Modeling and	Site Visits	Quizzes & Presentations	Assignments	Written Exam	Practical Exam
Knowledge	a1	1		1									1	
	a2	1		1									1	
	a3	1											1	
	a4	1											1	
	a5	1											1	
	a6	1											1	
	a7	1											1	
	a8	1											1	
Intellectual	b1										1	1	1	
	b2											1	1	
	b3										1	1	1	
	b4					1						1	1	
	b5					1							1	
Ap pli	c1		1			1								1

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	c2		1										1
	c3		1										1
	c4		1										1
General Tran	d1			1			1		1			
	d2			1			1					
	d3			1			1		1			

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes

    S. A. Gawish, Introduction to computers (2), Cairo,2008

    A. A. Khedr Introduction to computers (2),practical part, Cairo,2008

6-2 Essential books (text books)

    Gale E., Introduction to Micro-computing, Newell,1991.

    Peter Norton's. Introduction to computers, Fifth edition , Student Edition, 2002

    David Reed . A Balanced Introduction to computer Science, Prentice hall , 2004

6-3 Recommended books

  Non

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

7- Facilities required for teaching and learning:

    Computer Labs.

    Data show and Computer programs; Microsoft office

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

Modern Academy for Engineering & Technology
Mechanical Engineering Department

Course Specification
E211: Computer Programming I

A- Affiliation

Relevant program: Computer Engineering and Information Technology BSc. Program
Electronics. Engineering and Communication Technology BSc. Program
Manufacturing Engineering and production Technology BSc. Program

Department offering the program: Electronic Engineering and Communications Technology Dept.
Computer Engineering and Information Technology Dept.
Manufacturing Engineering and Production Technology Dept

Department offering the course: Computer Engineering and Information Technology Dept.

Date of specifications approval: September 2015

B - Basic information

Title: Computer Programming (I)   **Code:** E210   **Year/level:** 2nd year, 1st semester

Teaching Hours: **Lectures:** 2   **Tutorial:** -

Practical: 2   **Total:** 4

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to acquaint students with the methodologies of problem solving and the way of formulating the problem such that it can be expressed as an algorithm and thereby convert it into computer program. Moreover, running, testing, debugging the program and analyzing output are among these objectives.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding:

By the end of the course the student should be knowledgeable of:

a1- Program design and documentation tools. (A1, A2, A4)
a2- Syntax of Pascal as example of high level languages. (A5, A13, A16, A18)
a3- Various types of errors (syntax, logical, run-time). (A2, A5, A18)
a4- Arrays as a storage of multiple data elements in primary memory. (A13, A16, A18)
a5 - Syntax of functions and making calls. (A15, A18)

B - Intellectual skills:

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

b1- Design program and derive its functional specifications. (B1, B2, B3)
b2- Debug programs. (B2, B6, B16, B17)
b3- Create fully operational programs from multiple modules. (B8, B13, B14)
b4- Use documentation tools. (B13, B14)

C- Professional and practical skills:

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

c1- Develop software using Pascal language. (C6, C15)
c2- Convert HLL programs into executable code. (C14, C15)
c3- Document programs. (C18)

D- General and transferable skills:

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

      d1- Communicate effectively in written form. (D1, D3)

      d2- Demonstrate efficient IT capabilities. (D4)

      d3- 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	A1, A2, A4, A5, A13, A15, A16, A18
B	Intellectual skills	B1, B2, B3, B6, B8, B13, B14, B16, B17
C	Professional and practical skills	C6, C14, C15, C18
D	General and transferable skills	D1, D3, D4, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Steps for solving problems by comp. programs	2	-	
• Program documentation and flow charts	2	-	
• Structured programming	4	-	
• program parts	2	-	2
• Input / Output	2		4
• Data types and declaration	2	-	4
• Operators and precedence	2		6
• Selection constructs	4	-	3
• Loops	4		4
• Arrays	3		3
• Procedures and Functions	3		4
Total hours	**30**	**-**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and Simulation	Site Visits	Assignments	Quizzes & Presentations	Written Exam	Practical Exam
		Teaching Methods						**Learning Methods**			**Assessment Methods**			
Knowledge	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	1	1
	a4	1	1	1	1	1	1						1	
	a5	1	1	1	1	1							1	
Intellectual	b1	1	1	1	1	1					1	1	1	
	b2	1	1	1	1	1	1				1	1	1	1
	b3	1	1	1	1	1	1						1	1
	b4	1	1	1	1	1							1	
Applied	c1						1							1
	c2						1							1
	c3						1							1
General Tran	d1										1	1		
	d2										1	1		
	d3										1	1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6th Week	10
Practical Exam	14th , 15th Weeks	20
Written Exam	Sixteenth Week	60
Total		**100**

6- List of references:

6.1 Course notes   Lecture and Lab Notes
6.2 Required books   Robert Lafore, "Object oriented Programming In C++", SAMS, 2002
6.3 Recommended books: Non
6.4 Periodicals, Web sites, etc.:   Non

7- Facilities required for teaching and learning:
- Data Show and laptop computer

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

Modern Academy for Engineering & Technology
Computer Engineering and Information Technology Department

Course Specification
E 213: Computer Programming II

A- Affiliation

Relevant program: Computer Engineering and Information Technology BSc. Program
Electronics. Engineering and Communication Technology BSc. Program
Manufacturing Engineering and production Technology BSc. Program

Department offering the program: Electronic Engineering and Communications Technology Dept.
Computer Engineering and Information Technology Dept.
Manufacturing Engineering and Production Technology Dept.

Department offering the course: Computer Engineering and Information Technology Department

Date of specifications approval: September 2015

B - Basic information

Title: Computer Programming (II)   **Code:** E213   **Year/level:** 2nd year, 2nd Semester

Teaching Hours: **Lectures:** 2   **Tutorial:** -

Practical: 2   **Total:** 4

C - Professional information

1 – Course Learning Objectives:

The main objective of this course is to acquaint students with the methodologies of problem solving and the way of formulating the problem such that it can be expressed as an algorithm and thereby convert it into computer program. Moreover, running, testing, debugging the program and analyzing output are among these objectives.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding:

By the end of the course the student should be knowledgeable of:
 a1- Program design and documentation tools in C++ development environment. (A1, A2, A4)
 a2- Array variables in C++ programming language. (A13, A16, A18)
 a3- Subprograms in C++. (A15, A18)

B - Intellectual skills:

By the end of the course the student should be able to:
 b1- Formulate problems by building algorithms from given problem data. (B1, B2, B3)
 b2- Design programs specifications from the algorithm. (B1, B2, B3)
 b3- Deduce errors and suggest corrections (B6, B16)
 b4- Debug programs written in C++. (B2, B3, B17)

C- Professional and practical skills:

By the end of the course the student should be able to:
 c1- Develop software using C++ (C6, C15)
 c2- Convert HLL programs into executable code. (C14, C15)
 c3- Document programs. (C18)

D- General and transferable skills:

By the end of the course the student should be able to:
 d1- Communicate effectively in written form. (D1, D3)

d2- Demonstrate efficient IT capabilities. (D4)

d3- Search for information and adopt life-long self-learning. (D7)

Course Contribution in the Program ILO's

LO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A13, A15, A16, A18
B	Intellectual skills	B1, B2, B3, B6, B16, B17
C	Professional and practical skills	C6, C14, C15, C18
D	General and transferable skills	D1, D3, D4, D7

3 – Contents:

Topic	Lecture hours	Tutorial hours	Practical hours
• Function calls and function returns	4	-	6
• Pointers in programming	6	-	6
• Structures	4	-	4
• Classes and objects	6		6
• File IO	6	-	4
• Windows Programming	4		4
Total hours	**30**	**-**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions & Seminars	Tutorials	Problem solving	Laboratory & Experiments	Researches and Reports	Modeling and	Site Visits	Assignments	Quizzes & Presentations	Written Exam	Practical Exam
Knowledge	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
Intellectual	b1	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	
	b4	1	1	1	1	1		1	1	1			1	
Applied	c1						1							1
	c2						1							1
	c3						1							1
General Tran	d1										1	1		
	d2										1	1		
	d3										1	1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6th Week	10
Practical Exam	14th, 15th Weeks	20
Written Exam	Sixteenth Week	60
Total		**100**

6- List of references:

    6.1 Course notes   Lecture and lab notes
    6.2 Required books   Robert Lafore, "Object oriented Programming In C++", SAMS, 2002
    6.3 Recommended books: Non
    6.4 Periodicals, Web sites, etc.:   Non

7- Facilities required for teaching and learning:

- Data Show and laptop computer

Course coordinator: Dr. Adel Khedr

Head of the Department: Dr. Said Gawish

Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M150: Engineering Drawing &Projection I
Course Specifications

A- Affiliation

Relevant programs:	Computer Engineering & Information Technology BSc. Program.
	Electronic Engineering & communication Technology BSc Program.
	Manufacturing Engineering & Production Technology BSc. Program
	Architectural Engineering & Building Technology BSc. Program.
Departments offering the programs:	Computer Engineering & Information Technology Dept.
	Electronic Engineering & communication Technology Dept.
	Manufacturing Engineering & Production Technology Dept.
	Architectural Engineering & Building Technology Dept.
Department offering the course:	Manufacturing Engineering & Production Technology Dept.
Date of specifications approval:	September 2015

B - Basic Information

Title: Engineering Graphics I   **Code:** M150   **Year/level:** 1-st year / 1-st Term
Teaching Hours: **Lectures: --**   **Tutorial: 4**
 Practical: --   **Total: 4**

C - Professional information

1 – Course Learning Objectives
A study of this course will enable the student to visualize and communicate three dimensional objects.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge.
 a1-The principles of geometrical construction in engineering graphics.(A4)
 a2-The basic information and theories in engineering graphics. (A1, A2)
a3- Methodology of solving problems in orthographic views.(A5)
a4- Methodology of solving problems in successive views.(A5)
 a5-The basic and theories of developments and intersections. (A1, A5)

B - Intellectual skills
By the end of the course the student should be able to:
 b1- Solve and communicate problems in orthographic views. (B3, B2)
 b2- Solve and communicate problems in isometric and oblique drawings.(B2, B3)
 b3- Consider the benefits of solving problems of developments and intersections.(B8, B4)

C - Professional and practical skills
By the end of the course the student should be able to:
 c1- Produce orthographic views from 3D models.(C3)
 c2- Read and understand orthographic drawing.(C3, C2)
 c3- Prepare and interpret engineering drawing.(C1).

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. (D1, D3)
 d2- Expand their creative talents and to communicate their ideas in a meaningful manner. (D3)
 d3- Search for information and engage in life –long sell learning discipline. (D7)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4, A5
B	Intellectual skills	B2, B3, B4, B8
C	Professional and practical skills	C1, C2, C3
D	General and transferable skills	D1, D3, D7

3 – Contents

Topic	Lecture hours	Tutorial hours
Drawing instruments , Draw sheets ; Scales; Folding		4
Lettering Alphabet of lines		4
Geometric Construction		8
Theory of orthographic projection		4
Projection of point ; line and plane ; true shape		4
Projection of geometric solids		8
Multi view drawing		12
Pictorial drawing (isometric)		8
Pictorial drawing (oblique)		4
Revision		4
Total hours		**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1		1								1				1
	a2	1	1		1	1				1			1		1		1
	a3	1	1		1	1				1			1				1
	a4	1			1	1							1		1		1
	a5																
Intellectu	b1	1	1										1				1
	b2	1			1	1							1				1
	b3	1			1	1				1			1		1		1
Applied	c1	1			1	1				1			1				1
	c2	1			1	1				1			1				1
	c3	1			1												1
General	d1	1			1												1
	d2	1			1	1											1
	d3	1			1												1

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

Engineering Drawing (1) 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 .

7- Facilities Required for Teaching and Learning

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

Course Coordinator: Prof. Mamdouh Saber
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M151: Engineering Drawing & Projection II
Course Specifications

A- Affiliation
Relevant programs: Computer Engineering & Information Technology BSc. Program
Electronic Engineering & communication Technology BSc. Program
Manufacturing Engineering & Production Technology BSc. Program.
Architectural Engineering & Building Technology BSc. Program

Departments offering the programs: Computer Engineering & Information Technology Department.
Electronic Engineering & communication Technology Department.
Manufacturing Engineering & Production Technology Department.
Architectural Engineering & Building Technology Department.

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

B - Basic Information
Title: Engineering Graphics II   **Code:** M151   **Year/level:** 1-st year / 2-nd Term
Teaching Hours: **Lectures:** 2   **Tutorial:** 4
    Practical: --   **Total:** 6

C - Professional Information
1 – Course Learning Objectives
A study of this course will enable the student to:

A study of this course will enable the student to:
- Originate section, know ways of drawing and location of cross section.
- Use the principles of drawing different types of sections for showing internal features.
- Apply the conventional way in sections and dimensions for presentation of figures.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge.
a1- Section views. (A1, A2, A4)
a2- Presentation of components in sectional views. (A1, A2)
a3- Conventional way in sectional views. (A1, A2)
a4-The correct rules for dimensioning.(A1, A4)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Draw different problems in sectional views. (B3, B9)
b2- Select the proper section for each component. (B3, B8)
b3- Draw dimensions for components from production point of view. (B3, B9)

C – Professional and practical skills
By the end of the course the student should be able to:
c1- Read orthographic drawing with sectional views. (C1, C3, C4)
c2- Make necessary views using sections and dimensioning. (C1, C3, C4)
c3- Communicate by graphic language. (C3, C4)

D – General and transferable skills
By the end of the course the student should be able to:
d1- Communicate graphically effectively. (D3)
d2- Refer to relevant literature. (D9)

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Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A4
B	Intellectual skills	B3, B8, B9
C	Professional and practical skills	C1, C3, C4
D	General and transferable skills	D3, D9

3 – Contents

Topic	Lecture hours	Tutorial hours
• Importance of drawing sections	2	4
• Basic types of sections	2	4
• Full sections : longitudinal ,cross – section	2	4
• Off set ; aligned sections	2	4
• Half-section ;Partial S.; Revolved	2	4
• & Auxiliary sections .	2	4
• Dimensioning – Arrangements of	2	4
• dimensions – Rules for dimensions	2	4
• of circles ; radii ; angles ; plain holes	2	4
• Conventional practice in ED	2	4
• Drawing of steel sections	2	4
• Steel constructions	6	12
• Revision	2	4
Total hours	**30**	**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1		1								1				1
	a2	1	1		1					1			1				1
	a3	1	1		1					1			1		1		1
	a4	1			1								1				1
Intellectual	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	c1	1			1	1				1			1				1
	c2	1	1		1	1				1			1				1
	c3	1	1		1	1				1			1				1
General Tran.	d1	1	1		1	1				1			1				1
	d2	1	1		1	1				1			1				1

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

Engineering Drawing (2) 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

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

Course Coordinator: Prof. Mamdouh Saber
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M160: Production Engineering -Workshop I
Course Specifications

A- Affiliation

Relevant programs:
Computer Engineering & Information Technology BSc. Program.
Electronic Engineering & communication Technology BSc. Program.
Manufacturing Engineering & Production Technology BSc. Program.
Architectural Engineering & Building Technology BSc. Program

Departments offering the programs:
Computer Engineering & Information Technology Department.
Electronic Engineering & communication Technology Department.
Manufacturing Engineering & Production Technology Department.
Architectural Engineering & Building Technology Department.

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

Date of specifications approval: September 2015

B - Basic Information

Title: Production Engineering I   **Code:** M160   **Year/level:** 1-st year / 1-st Term

Teaching Hours: **Lectures:** 2   **Tutorial:** --

    Practical: 2   **Total:** 4

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:

- Be familiar with the basic production engineering, basics of casting, metal forming & welding
- Understand the essentials of Material properties, selection and testing principle.
- Incorporate his/her concurrent Knowledge related to production engineering in his /her future job.
- Illustrate the potential applications of die casting, rolling, drawing and special welding Processes as MIG , TIG and Co_2 welding in a variety of production engineering applications.
- Participate effectively in communities activities related to production engineering.

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 production methods related to casting , metal forming processes and welding. (A1)
a2- The pattern design , allowances in casting & solidification .(A4)
a3- The basics of centrifugal casting process. (A2)

B - Intellectual skills

By the end 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, design of weld. (B3)
b3- Choose the suitable welding method.(B8)
b4- Use the principle of production engineering in producing good quality cheap product. (B10, B2)

C - Professional and practical skills

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

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

D - General and transferable skills

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

d1-Collaborate effectively within multidisciplinary team. (D1, D3)
d2-Communicate effectively. (D3)
d3- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A2, A4
B	Intellectual skills	B2, B3, B8, B10
C	Professional and practical skills	C1, C3, C7
D	General and transferable skills	D1, D3, D6

3 – Contents

Topic	Lecture hours		Practical hours
Role of prod eng., production system objective	2		
Types of industries Engineering materials	2		
Properties of materials , material testing principles	2		
Tensile test , hardness test , standardization	2		6
Impact test , fatigue test , creep test	3		4
Sand casting, melting of metals & furnaces	3		4
Solidification, pattern design	2		2
Pattern allowances, sand molding & gating system .	2		2
Die casting, centrifugal & investment casting	2		2
Hot & cold forming , forging , rolling	2		2
Extrusion , sheet &wire drawing	2		
Types of welding , design of welding	2		2
Oxy- acetylene welding , Electric-arc welding	2		4
Submerged arc welding , MIG ,TIG, resistance welding	2		2
Total hours	**30**		**30**

4 - Teaching and Learning and Assessment methods:

	Course ILO's	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledg	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
Intellectual	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	c1	1		1									1	1		1	1
	c2	1	1														
	c3	1	1														
General	d1		1	1													
	d2			1											1		
	d3													1			

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	10
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

Kazanas , H.c. and Baker , G. E., Basic Manufacturing processes, McGraw – Hill, 1981

6-4 Periodicals, Web sites etc . Non

7- Facilities Required for Teaching and Learning

- Lecture room , laboratory and workshops

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M161: Production Engineering - Workshop II
Course Specifications

A- Affiliation

Relevant programs: Computer Engineering & Information Technology BSc. Program.
Electronic Engineering & communication Technology BSc. Program.
Manufacturing Engineering & Production Technology BSc. Program.
Architectural Engineering & Building Technology BSc. Program

Departments offering the programs: Computer Engineering & Information Technology Department.
Electronic Engineering & communication Technology Department.
Manufacturing Engineering & Production Technology Department.
Architectural Engineering & Building Technology Department.

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

Date of specifications approval: September 2015

B - Basic Information

Title: Production Engineering II   **Code:** M161   **Year/level:** 1-st year / 2-nd Term

Teaching Hours: **Lectures: 2**   **Tutorial: --**

   Practical: 2   **Total: 4**

C - Professional Information

1 – Course Learning Objectives
A study of this course will enable the student to:
- Be familiar with the basics of machining methods, turning, drilling, milling, shaping & grinding
- understand the essential requirements for tool materials and tool geometry
- Incorporate his/her concurrent knowledge related to machining processes in his/her future job
- Apply his / her knowledge to estimate manufacturing cost & select production method
- Illustrate the potential application of different machining methods in production
- Participate effectively in communities activities related to parts manufacturing

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge.
   a1- Identification of the basic conventional machining methods, tools, machine tools & function of its parts.(A1)
   a2- The effect of the selection of operation & working conditions on the accuracy.(A4)
   a3- The basic elements of manufacturing cost machining & production time. (A2)
   a4- Definition of the types, properties and use of different kinds of tool materials. (A1)

B - Intellectual skills
By the end of the course the student should be able to:
   b1-Choose the suitable machining method to reach prescribed accuracy. (B2)
   b2- Elaborate the proper technological procedure.(B3)
   b3- Select the machine tool (tools & working conditions). (B2)
   b4-Analyze the elements of cost which enables him/ her to choose the proper level of machine automation. (B10, B2)

C - Professional and practical skills
By the end of the course the student should be able to:
   c1- Use the studied machining methods producing prototypes during practice. (C3)
   c2- Solve simple machining problems related to time study and production costing. (C7)
   c3- Collect and submit data about workshop activities. (C1)

D - General and transferable skills

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

d1- Effectively manage tasks, time, and resources. (D1, D3)

d2-Collaborate effectively within multidisciplinary team.(D3, D9)

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

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A2, A4
B	Intellectual skills	B2, B3, B10
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
Basic machining methods , types of production	2		2
Principle of chip formation in orthogonal cutting	2		2
Mechanical & thermal stresses on tool, favorite properties	2		2
For tool materials , hot hardness			
Common types of tool materials , properties & application	2		2
Geometry of single point tool , angles , types	2		
Turning	4		6
Drilling	2		2
Milling	2		4
Time of machining & time study	2		
Principle of shaping , planning , slotting & broaching	2		4
Grinding operations , grinding which selection & accuracy	2		2
Technological procedure , selection of cutting conditions	2		4
Costing of machined parts , elements of cost	4		
Total hours	**30**		**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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	1	1
	a3	1	1	1						1			1	1	1	1	1
	a4	1	1	1									1	1	1	1	1
Intellectual	b1	1	1	1									1	1	1	1	1
	b2	1	1	1									1		1		1
	b3	1		1									1	1		1	1
	b4	1			1	1		1	1				1	1	1	1	1
Applied	c1	1	1														
	c2		1	1													
	c3			1											1		
General Tran	d1	1	1	1									1	1	1	1	1
	d2	1	1	1						1			1	1	1	1	1
	d3	1	1	1						1			1	1	1	1	1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	10
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

   Kazanas HC and Baker GE, Basic Manufacturing processes, McGraw-Hil 1981.

6-4 Periodicals, Web sites etc.: Non

7- Facilities Required for Teaching and Learning

- Lecture room , laboratory and workshops

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department
M201: Fluid Mechanics
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Fluid Mechanics   **Code:** M201   **Year/level:** 2nd year / 1st Term

Teaching Hours: **Lectures: 4**   **Tutorial: 1**

Practical: 1   **Total: 6**

C - Professional Information
1 – Course Learning Objectives

A study of this course will enable the student to have better understanding of fluid substances, their properties and their effect on fluid behavior. Physical laws that govern fluid dynamics. In addition to similitude, dimensional analysis, and model design.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:
On successful completion of the course, 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 as 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)

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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.	8	2	-
• Fluid statics: Pressure at a point, pressure field, pressure measurement, hydrostatic forces acting on plane and curved surfaces, buoyancy, floatation, and stability.	11	2	2
• Fluid kinematics :The velocity field, acceleration field, Reynolds's transport theorem.	11	2	4
• Conservation laws: Conservation of mass- continuity equation, conservation of linear and angular momentum, conservation of energy.	11	3	2
• 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.	12	4	2
• 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.	7	2	5
Total hours	60	15	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	Laboratory & Experiments	Projects	Researches	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1	1			1				1		1		1
	a2	1			1	1	1				1		1	1	1		1
	a3			1	1	1		1	1						1		1
	a4	1					1		1								1
	a5	1			1	1	1		1				1		1		1
	a6	1			1	1			1				1		1		1
	a7	1			1	1		1	1	1			1		1		1
	a8	1			1	1		1	1				1				1
Intellectu	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

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		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Applied	b4		1	1			1				1		1		1
	b5		1	1		1	1	1					1		1
	b6						1	1						1	1
	c1			1				1			1		1		1
	c2					1		1				1			
	c3		1	1		1	1	1						1	
General	d1					1	1	1		1				1	
	d2	1				1	1	1						1	
	d3	1					1	1		1				1	
	d4	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	6th Week	10
Practical Part & Practical Exam	13thWeek	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6.1 Course notes   Selected topics of fluid Mechanics, Dr. A. A. Abdalla

6.2 Required books

B.R. Munson, D.F. Young, & T.H., Okiishi, Fundamentals of Fluid Mechanics, John Wiley & Sons, Inc., 7th. ed., 2012.

6.3 Recommended books

F.M. White, Fluid Mechanics, McGraw-Hill, 4th ed., 1999.

6.4 Periodical, Web sites, etc.: Non

www.tecquipment.com
https://legacy.saylor.org/me201/
http://www.efluids.com/efluids

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 & Technology
Manufacturing Engineering and Production Technology Department

M222: Thermodynamics
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Thermodynamics   **Code:** M222   **Year/level:** 2nd year / 2nd Term
Teaching Hours: **Lectures: 4**   **Tutorial: 1**
     Practical: 1   **Total: 6**

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to have better understanding of heat and work, principle of conservation of energy, some of their applications. Student should be acquainted with Thermodynamics concepts, definitions, laws, and understand what is meant by pure substance. Also, student will perform some experiments concerning heat and energy

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

By the end 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

By the end 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

By the end 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	Program 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 science, some applications as; steam power plant, automotive engines, refrigeration and air conditioning. Mechanisms of heat transfer.	4	2	2
• **Concepts and definitions:** System, boundary, surroundings. Closed, open, and isolated systems. Macroscopic forms of energy, kinetic, potential, and internal energy. State of a system, process, cycle, reversible, and irreversible processes, and work.	12	3	3
• **Properties of a pure substance:** Definition, phase diagram of water (p-v), (T-v), Tables of steam. Equation of state, and compressibility factor, specific heat at const. volume, and at constant pressure.	12	2	4
• **First law of thermodynamics:** Statement of the first law for cycle. Different forms for a change of state of a control mass. The first law for a change of state of a control volume (enthalpy, general form, SSSF processes, USUF processes).	12	6	2
• **Second law of thermodynamics:** Definition of 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 reversible and irreversible processes, 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
Total hours	60	15	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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1				1				1		1		1
	a2	1			1				1				1		1		1
	a3	1			1	1			1				1		1		1
	a4	1			1	1			1						1		1
	a5	1			1	1	1		1				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
	a8	1				1		1	1	1			1		1	1	1
	a9	1				1		1	1	1			1		1	1	1
Intellectual	b1	1		1	1	1		1	1	1			1		1	1	1
	b2	1			1	1		1	1							1	1
	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
	b6	1			1	1		1	1	1			1		1	1	1
Applied	c1		1				1		1	1				1			
	c2	1	1	1	1	1	1	1	1	1			1	1	1	1	1
	c3						1			1				1			
	c4						1							1			
	c5		1				1	1	1								1
General	d1	1	1	1	1		1	1	1		1	1	1	1		1	
	d2						1	1	1							1	
	d3		1	1			1	1	1		1					1	
	d4		1	1			1	1	1			1	1	1	1	1	1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	13th 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

M.J. Moran and H.N. Shapiro, Fundamentals of Engineering Thermodynamics, 7th edition, John Wiley & Sons, 2011

6.3 Recommended books

Y.A. Cengel and M.A.Boyes, Thermodynamics: An Engineering Approach, 8rd edition, WCB, McGraw-Hill, 2014.
J.P. Holman, Thermodynamics, 4th edition, McGraw-Hill, 1998.

6.4 Periodical, Web sites, etc.:

http://www.infocobuild.com/education/audio-video-courses/chemistry/5-60-thermodynamics-spring2008-mitocw.html
http://www.learnthermo.com/tutorials.php
http://www.thermofluids.net/

7- Facilities Required for Teaching and Learning

- Thermodynamics laboratory.
- Library

Course Coordinator: Dr. Abdelmagid A. Abdalla
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M250: Engineering Skills I
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Engineering Skills I   **Code:** M250   **Year/level:** 2-nd year / 1-st Term
Teaching Hours: **Lectures:** --   **Tutorial:** 4
                       Practical: --   **Total:** 4

C - Professional Information

1 – Course Learning Objectives

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

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should know and understand:
  a1- The necessary data for production (drawing of detail drawing). (A2, A3, A6)
  a2- Dismountable joints used in assembly drawings. (A5, A6, A18)
  a3- Permanent joints used in assembly drawings. (A5, A6, A18)
  a4- Construction of machines. (A3, A4, A6, A18)
  a5- Design Documents. (A5, A6)

B - Intellectual skills
By the end of the course the student should be able to:
  b1- Make assembly drawings from detail drawings. (B3, B4)
  b2-Determine the function of the assembled unit. (B3, B4, B8)
  b3- Develop the sequence of assembling detail parts. (B14)

C - Professional and practical skills
By the end of the course the student should be able to:
  c1- Create new construction based on his knowledge of machine drawing. (C3, C14).
  c2- Read assembly drawing. (C2)
  c3- Make detail drawing from assembly. (C1, C13)
  c4- Choose the suitable standard joint. (C1, C2, C10)

D - General and transferable skills
By the end of the course the student should be able to:
  d1-Collaborate effectively during discussion and explanation of drawings. (D1)
  d2- Finish the required drawings during the determined time and deliver them in the due date. (D2)
  d3-Communicate graphically using the graphic language (D3).
  d4-refer to relevant standard (DIN, CSN, etc.). (D9)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A3, A4, A5, A6, A18
B	Intellectual skills	B3, B4, B8, B14
C	Professional and practical skills	C1, C2, C3, C10, C13, C14
D	General and transferable skills	D1, D2, D3, D9

3 – Contents

Topic	Lecture hours	Tutorial hours
Chapter 1: Data necessary for production		
1- Shape description		4
2- Size description		4
3- Tolerance and fits and geometrical accuracy.		8
4- Surface finish		8
5- Material description		4
Chapter 2: 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		8
4-2 Keyed joints.		8
4-3 Splines & serrations		
4-4 Pin joints		4
5- Non Dismountable joints		6
5-1 Welded joints		
5-2 Riveted Joints		4
Total hours		**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and	Site Visits	Discovering	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
	a3	1			1								1		1	1	1
	a4												1		1		
	a5	1											1		1	1	1
Intellectu	b1	1			1								1		1		1
	b2	1			1	1							1		1	1	1
	b3	1	1	1	1				1				1			1	
Applied	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
General	d1								1							1	
	d2		1	1					1	1						1	
	d3	1	1						1							1	1
	d4	1	1	1					1								

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5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

- Machine Drawing (1) by: Prof. Nabil Gadallah

6-2 Required books .

6-3 Recommended books: Engineering Drawing and Graphic Technology Mc-Graw Hill, 2009

6-4 Periodicals, Web sites etc.: CSN, DIN, ISO standard parts

7- Facilities Required for Teaching and Learning

OHP and screen

Model sand prototype as teaching aids

Course Coordinator: Prof. Mamdouh Saber
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M251: Mechanics of Machines I
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Mechanics of Machine I   **Code:** M251   **Year/level:** 2-nd year / 1-st Term

Teaching Hours: **Lectures: 2**   **Tutorial: 2**

                           Practical: --   **Total: 4**

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:
- Be familiar with the basics of the mechanics of machines.
- Find out and calculate the moment of inertia of different configurations.
- Analyze the motion of a system of particles.
- Solve dynamic problems (kinematics or kinetic solution).
- Design a cam according to a specified task and analyze the motion of an existing cam

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- How to analyze the motion of system of particles. (A1)
a2- How to analyze the plane motion kinematics of different bodies and mechanisms. (A1)
a3- The procedure of analyses and design of cams. (A1, A4)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Study the motion of system of particles. (B1, B2)
b2- Study and calculate the velocity and acceleration of bodies and mechanisms in plane motion using(force & acceleration) and (energy & momentum) methods. (B1, B2)
b3- Design and analyze the motion of cams. (B1, B2, B13)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Solve simple problems related to mechanics of machines. (C1)
c2- Use different techniques to analysis and design safe constructions. (C2, C7)

D - General and transferable skills
The graduates of the engineering programs should be able to:
d1-Collaborate effectively within multidisciplinary team. (D1)
d2-Work in stressful environment and within constraints. (D2)
d3-Communicate effectively. (D3)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A4
B	Intellectual skills	B1, B2, B13
C	Professional and practical skills	C1, C2, C7
D	General and transferable skills	D1, D2, D3

3 – Contents

Topic	Lecture hours	Tutorial hours
• Moment of Inertia	2	2
• System of Particles	6	6
• Kinematics of Rigid Bodies	4	4
• Plane Motion of Rigid Bodies: Force & Acceleration	6	6
• Plane Motion of Rigid Bodies: Energy & Momentum	6	6
• Cams	6	6
Total hours	**30**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
			Teaching Methods						**Learning Methods**				**Assessment Method**				
Knowledge	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
Intellectu Applie	b1	1			1	1			1				1		1		1
	b2	1			1	1			1				1		1		1
	b3	1	1		1	1		1	1				1		1		1
Applie	c1	1			1	1		1					1		1		1
	c2	1	1		1	1		1	1				1		1		1
General	d1		1	1				1	1							1	
	d2		1	1				1	1	1						1	
	d3		1	1				1	1	1						1	

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes

6-2 Recommended books (text books)

-Beer and Johnston, Vector Mechanics for Engineers- Statics, 8th Edition in SI Units, ISBN 978-07-125765-7, U.S.A., 2007.

6-3 Recommended books

Geoffery H. R. "Mechanics of Machines", Industrial Press, 1990

Khurmi R.S. "Theory of Machines", Eurasia Publishing House, 2014

Martin G.H. "Kinematics and Dynamics of Machines", Waveland Press, 2nd edition, 2002

6-4 Periodicals, Web sites, etc.

No Periodicals are requested

7- Facilities Required for Teaching and Learning

None

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M252: Mechanics of Machines II
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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 Machine II   **Code:** M252   **Year/level:** 2nd year / 2nd semester
Teaching Hours: **Lectures:** 2   **Tutorial:** 2
    Practical: --   **Total:** 4

C - Professional Information

1 – Course Learning Objectives

The main objective of this course is to enable the students to understand the basic concepts and theories of gears, gyroscopes, inertia forces and couples, and flywheel. The student should be able to analyze any system of gears, forces and couples on mechanisms and machines and able to share in the design calculations of mechanical systems.

2 - Intended Learning Outcomes (ILOS)

A- Knowledge and understanding
On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- The different types of gear, gear trains and their basic equations. (A1, A4)
a2- The dynamic force and moment analysis in machines. (A4, A5)
a3- Gyroscopic effects, their estimations, and fields of their applications. (A1, A12, A13)
a4- The design calculations of flywheels. (A18)

B - Intellectual skills
On successful completion of the course, the student should be able to:
b1- Select the proper mechanism for each machine. (B2, B3)
b2- Evaluate gearboxes, mechanisms, and machines, and propose improvements. (B12 , B15)
b3- Design simple mechanisms. (B13, B17)

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, design to solve engineering problems related to gearboxes, mechanisms, and machines. (C1)
c2- Professionally merge the engineering knowledge, understanding, and feedback to improve design, products/or services. (C2, C5)
c3- Exchange knowledge and 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- Search for information from diverse references and internet. (D3, D7, D8, D9)
d2- Write technical reports and perform the given arrangements. (D2, D6)
d3- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A4, A5, A12, A13, A18
B	Intellectual skills	B2, B3, B12, B13, B15, B17
C	Professional and practical skills	C1, C2, C5, C11
D	General and transferable skills	D2, D3, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours
• Kinematics of motion		
- Types of motion of particles	1	
- Displacement, velocity, and acceleration of a moving object	1	2
- Graphical representation of displacement, velocity, and acceleration versus time	2	2
• Velocity in mechanics		
- Plane motion of a rigid body	1	4
- Determination of the velocity on points of a rigid body using the instantaneous center method	3	
• Gears and gear trains		
- Functions and types of gear trains	2	
- Types of gear- shaft mountings	2	2
- Transmission ratios and efficiencies of gear trains	4	6
- Different designs of gear boxes	2	2
• Gyroscopic couple and processional motion		
- Definition of gyroscopes and gyroscopic effect	2	
- Vector relations of spin, processional motions	2	2
- Calculation of the gyroscopic couple	2	4
• Turning moment diagram and flywheel		
- Analyzing of forces and couples in reciprocating engines	1	
- Turning moment diagrams in reciprocating engines	1	2
- Fluctuation of energy and speed of rotation	1	
- Flywheel design calculations	1	2
• Revision	2	2
Total hours	**30**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods						Learning Methods				Assessment Method				
		Lecture	Presentations & Movies	Discussions	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	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

Intellectu	b1	1			1	1						1		1		1
	b2	1			1	1						1		1		1
	b3	1			1	1						1		1		1
Applied	c1	1			1	1						1		1		1
	c2	1			1	1						1		1		1
	c3	1	1		1	1						1		1		1
General	d1									1						1
	d2									1						1
	d3									1						1

5- Assessment Timing and Grading:

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

6- List of References

6-1 Course notes: Non

6-2 Required books

Hussein G. A. "Printed book in Modern Academy"

6-3 Recommended books

Khurmi R.S. "Theory of Machines", Eurasia Publishing House, 2014

Martin G.H. "Kinematics and Dynamics of Machines", Waveland Press, 2nd edition, 2002

6-4 Periodicals, Web sites, etc.

https://infinit.io/link/ashit/36xhQxq

www.pearsonhigher.com

www.udco.com

7- Facilities Required for Teaching and Learning

Data show

Course Coordinator: Assoc.Prof. Gaafar A. Hussein
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M253: Engineering Skills II
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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 2011

B - Basic Information

Title: Engineering Skills II **Code:** M253 **Year/level:** 2-nd year / 2-nd Term
Teaching Hours: **Lectures:** -- **Tutorial:** 4
  Practical: -- **Total:** 4

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, B8, B17
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
			4

2	**CHAPTER I: Sliding Bearings**
	    A- Radial Sliding Bearing (Journal bearings)
	    B- Thrust Sliding Bearing
	    C- Combined Loaded Sliding Bearing
			8

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
			8

4	**PART II: POWER TRANSMISSION**
	    1. General:
	        Direct (in contact) drives
	        Indirect drives
	    2. General kinematics
	    3. General Kinetics
	    4. Efficiency of power Transmission
			4

5	**CHAPTER IV: Gear Drive**
	    1. Spur gears
	    2. Helical gears.
	    3. Bevel gears
	    4. Worm gears
	    5. Gear Train
			4
			4
			4
			4
			4

6	**CHAPTER V: BELT DRIVES**
	    1. Classification
	    2. General kinematics
	    3. General Kinetics
	    4. Efficiency of power Transmission
			8

7	**CHAPTER VI: CHAIN DRIVES**		4

8	**PART III: SPRINGS**
	    Kind of Springs
	    Applications
			4

Total hours			**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	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	
Intellectu	b1	1		1	1	1							1		1	1	
	b2	1		1	1	1							1		1	1	
	b3	1		1	1	1									1	1	
Applied	c1	1		1	1												
	c2	1		1	1								1		1	1	
	c3	1		1	1								1		1	1	
	c4	1		1	1								1		1	1	
General	d1			1	1				1								
	d2			1	1				1								
	d3				1				1								

5- Assessment Timing and Grading:

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

6- List of references:

6-1 Course notes: 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

6-4 Periodicals, Web sites, etc.:

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M261: Strength of Materials
Course Specifications

A- Affiliation
Relevant Program   :   Manufacturing Engineering and Production Technology BSc. Prog.
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: Strength of Material   Code: M261   **Yea/level:** 2ndYear , 1stSemester
Teaching Hours: **Lectures:** 2   **Practical:** 2
                                             Total: 4

C-Professional Information
1-Course Learning objectives:

A study of this course will enable the student to understand fundamentals of applied loads (Force, Torsion, Bending), stress and strain relations in loaded beams, perform mechanical tests of Engineering Materials (Tensile, Bending, Torsion, Impact,), and analyze elements subjected to combined stresses.

2 – Intended Learning Outcomes (ILOs)
A-Knowledge and Understanding:
By the end of the course the student should acquire the 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 - Solve simple problems concerning statically determinate and indeterminate systems.(B7)
   b3 - Analyze how the mechanical characteristics obtained in laboratory.(B6)
   b4 – Compare between the damages of mechanical elements subjected to combined loads.(B13,
      B14, B17)

C- Professional and Practical Skills
By end of the course the student should be able to:
   c1 - Carry out stress and strain analysis in tensile test. (C5)
   c2 - Carry out tensile, impact, torsion, bending, hardness, creep, and fatigue tests (C16, C17)
   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
By end of the course the student should be able to:

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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	C3, C5, C8, C12, C16, C17
D	General and transferable skills	D1, D3, D9

3- Contents

	Topic	Lecture hours	Practical& Tutorial hours
1	Loads and Reaction	2	
	Tensile Test		2
2	Tension and Compression	3	2
	Hardness Test		2
3	Statically Indeterminate Force Systems	3	2
	Impact Test		2
4	Geometrical Characteristics of a Plane Figures	4	
	Fatigue Test		4
5	Direct Shear Stress	2	2
6	Torsion	2	
	Torsion Test		2
7	Shearing Force and Bending Moment	4	
	Bending Test		4
8	Stresses in Beams	4	
9	Combined Stresses	4	
	Compression, Creep, Polari scope Tests		4
10	Deflection of beams		2
11	Revision	2	2
	Total hours	30	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	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	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	1	

Intellectual	b1	1			1							1		1	1	
	b2	1		1	1							1			1	
	b3	1			1		1					1	1	1	1	
	b4	1		1	1		1					1				
Applied	c1	1		1	1		1					1				
	c2	1		1	1		1					1	1	1	1	
	c3	1		1	1		1					1	1	1	1	
	c4	1		1	1		1					1		1	1	
	c5	1		1	1											
General	d1			1			1		1				1			
	d2			1	1		1		1				1			
	d3				1				1							

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes
Strength of Materials, elaborated by the instructor

6-2 Recommended books (text books)
WILLIAM A. NASH, Fifth edition, Strength of Materials, McGraw-Hill, 2011
V.FEODOSYEV, Strength of Materials, MIR PUBLISHERS, MOSCOW, 1968

6-3 Recommended books: Non

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

Course coordinator: Assoc. Prof. Dr. Eng. Ahmed Fouad EL Sanabary
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M262: Materials Technology
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Material Technology I   **Code:** M262   **Year/level:** 2-nd year / 2-nd Term
Teaching Hours: **Lectures:** 2   **Tutorial:** 1
                        Practical: 1   **Total:** 4

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:
- Understand the basic information about engineering materials.
- Know the fundamentals of Metals and their alloys.
- Correlate the microstructure of ferrous and Non-ferrous alloy to the properties.
- Understand the fundamentals of Heat treatment and harden ability test.
- Understand the basic knowledge about Polymers, ceramics, and composite materials.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- The behavior of metals and alloys. (A2)
a2- Binary equilibrium diagrams. (A3)
a3- Selection of suitable steel and cast iron for engineering tasks. (A4, A24)
a4- Proper selection of Polymers, ceramics, or composite materials. (A18, A24)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Identify different type of steels and their uses. (B13, B14, B16)
b2- Identify different types of cast iron and their structures (B13, B14, B16)
b3- Select the proper heat treatment processes for steels and Alloys.(B2)
b4- Compare and analyze the properties and uses of Non –ferrous alloys and their microstructure. (B16)
b5- Choose suitable ceramic, Polymer , composite material to certain engineering task.(B2, B19)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Analyze logically to solve any problem and reaching suitable solution. (C6, C16)
c2- Collect the required technical data to use it in creative solutions. (C3, C14)
c3- Use the subject to create more efficient new systems through creative thinking. (C1, C3, C14)

D - General and transferable skills
By the end of the course the student should be able to:
d1- Demonstrate efficient Reporting and tabulating the experimental data. (D4)
d2- Better use of time and resources to fulfil tasks. (D6)
d3- Refer to standards and relevant literatures of material technology. (D9)

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Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A2, A3, A4, A18, A24
B	Intellectual skills	B2, B13, B14, B16, B19
C	Professional and practical skills	C1, C3, C6, C16
D	General and transferable skills	D4, D6, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Crystal structure of Metals	2		2
Miller's indices	2	2	
Solidification of Metals	2		2
Binary Equilibrium Diagrams	2	2	
Iron – carbon system	2		2
Steels and microstructure	2	2	
Cast iron and microstructure	2		2
Heat treatment of steels	2	2	
Copper and its alloys	2		2
Aluminum and its alloys	2	2	
Strengthening Mechanisms	2		2
Lead and tin alloys (Babbits)	2	2	
Polymers and uses	2		2
Ceramics and composite materials	2	2	
Revision	2	1	1
Total hours	**30**	**15**	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
		Teaching Methods							**Learning Methods**				**Assessment Method**				
Knowledge	a1	1			1	1	1		1				1	1	1		1
	a2	1			1	1	1		1				1	1	1		1
	a3	1			1	1	1		1				1	1	1		1
	a4	1			1	1	1		1				1	1	1		1
Intellectual	b1	1			1	1	1						1		1		1
	b2	1			1	1	1						1		1		1
	b3				1	1	1		1					1	1		1
	b4				1	1	1		1					1	1		1
	b5				1	1	1		1					1	1		1
Applied	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	
General	d1		1	1					1						1	1	
	d2		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	10
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes   Materials Technology (Lecture Notes)
                           Materials Technology (Lab, Lecture Notes)

6-2 Required books
     William F. Smith, Principles of material science and Engineering, Mc Graw –Hill, 1995

6-3 Recommended books: Non

6-4 Periodicals, Web sites etc.: Non

7- Facilities Required for Teaching and Learning
<center>None</center>

Course Coordinator: Assist. Prof. Adel Elgammal
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M271: Principles of Manufacturing
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Principles of Manufacturing   Code: M271   Year/level: 2nd Year / 2nd term
Teaching Hours: Lectures: 2   Tutorial: 1
                                     Practical: -   Total: 3

C - Professional information

1 – Course Learning Objectives:

The main objectives of this course are to teach the basic principles of metal cutting processes including; turning, drilling. Boring, Planning, Shaping, Slotting, Milling, and Grinding; Cylindrical and surface grinding operations., and at the end of course the students should be able to elaborate the sequences of operations and operation cards which should be used to machine given parts.

2 - Intended Learning Outcomes (ILOs)

A - Knowledge and understanding:

By the end of the course the student should gain the following knowledge and   Knowledge and understanding ILOs:

a1- Principles and basis of machining deviations; dimensional, positional, shape, and surface roughness deviations (A3, A5).

a2- Cutting tool materials classification, properties, and basics geometry (A8).

a3- Basic concepts of used metal cutting processes including; turning, drilling, boring, planning, shaping, slotting, milling, surface and cylindrical grinding processes. At each process we introduce; the basic principles, clamping of tools and workpieces, machine tool types and main parts, operations to be performed and associated cutting tools, and attainable accuracy and surface roughness (A3, A4, A15).

a4- Machining time's calculations and the elaboration of the required sequence of operations required to machine given parts. Learning how to select proper processes, tools, cutting conditions, and measuring devices for a specific required accurate product (A1, A5, A13, A19).

B - Intellectual skills:

By the end of the course the student should be able to, and gain t6he following intellectual skills ILOs)

b1- Evaluate accuracy and surface roughness (Design drawings), and consequently select proper process(es), and checking devices (B1, B2).

b2- Select Machine tool and cutting tools for specific applications (B2, B4, B9, B18)

b3- Select and analyze cutting conditions for specific roughing or finishing applications (B4, B7, B9, B18).

C - Professional and practical skills:

By the end of the course the student should be able to, and gain the following Professional and Practical skills ILOs:

c1- Analysis accuracies and surface roughness's associated with each metal cutting operation (C5, C6, C10).

c2- Solve problems related machining times calculations (C1, C5).

c3- Elaborate the sequences of operations required to machine given parts (C6, C10, C12, C19).

c4- Elaborate the operation card for each operation at the sequence of manufacturing processes (C6, C10, C12, C19).

D - General and transferable skills:

By the end of the course the student should be able to, and gain the following General and Transferable skills ILOs):

d1- Planning and controlling designer and manufacture engineers activities corporation (D1, D3, D5, D6).

d2- Incorporates activities of several manufacturing shops for certain specific production application (D3, D5).

d3- Present findings in production workshops in simple and illustrative way (D2, D6).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4, A5, A8, A13, A15, A19
B	Intellectual skills	B1, B2, B4, B7, B9, B18
C	Professional and practical skills	C1, C5, C6, C10, C12, C19
D	General and transferable skills	D1, D2, D3, D5, D6

3 - Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction; Definition of technology, production system, manufacturing processes and elements of machining system	4	1	1
Machining Deviations; reasons, types, dimensional deviation and ISO system of tolerances, definitions and denotations of geometric deviations, standardization and measurement of surface roughness.	5	2	4
Classification of metal cutting processes.	1	1	2
Metals cutting tools failures, materials, and geometries	2	1	2
Turning process.	4	2	4
Drilling and boring processes.	4	1	2
Planning, shaping, and slotting processes.	2	1	3
Milling process.	4	1	4
Surface and cylindrical grinding processes.	4	3	4
At each metal cutting operations the following topics are going to be discussed; basic concepts, cutting tools and workpieces clamping methods, machine tool types and main parts, attainable accuracies and surface roughness, and sequences of operations required for specific applications for each metal cutting processes.			
Elaboration of technological procedures troduce a given products		2	4
Total	30	15	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
					Teaching Methods				Learning Methods				Assessment Method				
Knowledge	a1	1	1		1	1	1		1				1	1	1		1
	a2	1	1		1	1			1				1		1	1	1
	a3	1	1		1	1			1				1		1		1
	a4	1	1		1	1	1		1				1	1	1		1
Intellectu	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	c1	1			1	1			1				1	1	1		1
	c2	1			1	1			1				1	1	1		1
	c3	1			1	1			1				1	1	1		1
	c4	1			1	1			1				1	1	1		1
General	d1		1					1	1							1	
	d2		1					1	1							1	
	d3		1					1	1							1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	13thWeek	-
Written Exam	Sixteenth week	70
Total		100

6- List of references:

6-1 Course notes: Lecture & Exercises notes, ISO standard tables

6-2 Essential books (text books), None

6-3 Recommended books;

    Radford and Richardson, "Production Engineering Technology",3rd edition, 1980

6-4 Periodicals, Web sites, etc. Non

7- Facilities required for teaching and learning:

    Lecture Rooms, Metrology Lab., and Workshops.

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M310a: Computer Applications I
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Computer Applications I   **Code:** M310a   **Year/level:** 3-rd year / 1-st Term

Teaching Hours: **Lectures: --**   **Tutorial: --**

Practical: 2   **Total: 2**

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 specialized 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- the role of computer applications in mechanical engineering.(A2, A3, A4, A22,)

a2- the basic steps to use computer packages (such as Pro/Engineer) in solid modeling of parts, assemblies and in detaildrawings.)A6, A10)

a3- the numerical, symbolic & 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 & 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, B22)

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- Develop 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 required 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)

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Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A2, A3, A4, A6, A10, A13, A18, A24
B	Intellectual skills	B3, B4, B8, B17, B22
C	Professional and practical skills	C1, C2, C3, C10, C14, C22
D	General and transferable skills	D1, D3, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to computer applications:			2
• Computer graphics (Pro/Engineer)			4
• Engineering analysis (Matlab)			4
• Solid modeling techniques in art design			2
• Extrusion & Revolve			2
• Applications			2
• Sweep and blend			2
• Assemblies			2
• Detail Drawing (drafting)			2
Introduction to MATLAB			4
• Introduction & basic vector and matrix operations.			1
• Polynomials and solution of linear equations			1
• Programming and applications			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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1					1			1		1		1
	a2	1		1	1					1			1		1		1
	a3	1		1	1					1			1		1		1
Intellectual	b1	1		1	1					1			1				1
	b2	1		1	1					1			1				1
Applied	c1	1		1	1	1				1			1		1		1
	c2	1		1	1	1				1			1		1		1
General Tran	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

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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	-	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes

Lecture notes prepared by Professor Dr Nabil Gadallah, Modern Academy for Engineering & Technology, 2009.

6-2 Essential books (text books): Software manuals.

6-3 Recommended books

Edward B. Magrab et al, An Engineer's Guide to MATLAB, Prentice Hall, Third edition, 2011.

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M310b: Computer Applications II
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Computer Applications II   **Code:** M310b   **Year/level:** 3-rd year / 2-nd Term

Teaching Hours: **Lectures:** --   **Tutorial:** --

       Practical: 4   **Total: 4**

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
By the end of the course the student should gain the following knowledge and understanding:
a1- The definition of the NC and CNC machine. (A1, A8, A13, A21)
a2- The different types of the G-code. (A2, A8, A13, A21)
a3- The G-code (Fanuc). (A2, A8, A13)
a4- The G-code for milling operations. (A2, A8, A13, A22)
a5- The G-code for turning operations. (A2, A8, A13)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Define and describe the CNC machine. (B1, B2)
b2- Write a program in G-code (funoc). (B12, B13)
b3- Implement a simulation in milling and turning operations. (B4, B17, B22)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Adjust the CNC machine for the zero point. (C15,C1)
c2- Clamp the semi-product on the CNC machine(C15, C8)
c3- Enter the written program of the G-code on the CNC machine. (C21, C7, C22)

D - General and transferable skills
By the end of the course the student should be able to:
d1- Working a team work. (D1)
d2- Recording and reporting the results of different exercises .(D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A8, A13, A21, A22
B	Intellectual skills	B1, B2, B4, B12, B13, B17, B22
C	Professional and practical skills	C1, C7, C8, C15, C21, C22
D	General and transferable skills	D1, D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to NC and CNC Machines			2
Basic Definitions of G-Codes			2
Different Types of G-Codes			4
Basic Terminology of G-Code (FUNOC)			4
Milling:			
– Work piece Installation			4
– Determination of Zero Position			4
– Definition and Applications of G58 , G52			4
– Definition and Applications of G00			4
– Definition and Applications of G01			4
– Definition and Applications of G02 , G03			8
Turning:			
– Definition and Applications of G58 , G52			4
– Definition and Applications of G00			4
– Definition and Applications of G01			4
– Definition and Applications of G02 , G03			4
Revisions			4
Total hours			**60**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1		1		1				1	1	1		1
	a2	1		1	1	1	1		1				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		1
Intellectual	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		1
Applied	c1				1		1							1			1
	c2				1		1							1			1
	c3				1		1							1			1
General Tran.	d1						1		1					1		1	1
	d2						1		1					1		1	1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	20
Practical Exam	-	60
Oral Exam	Sixteenth week	-
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 A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M312: Industrial Management
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Industrial Management   **Code:** M312   **Year/level:** 3-rd year / 2-nd Term
Teaching Hours: **Lectures: 2**   **Tutorial: 2**

Practical: --   **Total: 4**

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to be familiar with the mathematical models and tools used in order to select the best possible decision under different conditions facing the Industrial Management.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- Mathematical linear models describing industrial processes, transportation, networking and capacity planning. (A1, A7, A20)

a2- Method of solving the models either directly, for simple application, or using the available computer based algorithms. (A1, A7, A20)

B - Intellectual skills

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

b1- Analyze real industrial processes. (B1)
b2- Identify the proper mathematical model describing the process.(B1)
b3- Formulate the model and supply the real problem parameters. (B7, B8)
b4- Solve the model and find out the optimum solution using different techniques. (B1, B8)

C - Professional and practical skills

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

c1- Build mathematical models simulating manufacturing processes. (C1, C5)
c2- Solve simple problems using mathematical techniques. (C1, C5, C6)
c3- Solve fairly complicated problems using educational software. (C6)

D - General and transferable skills

The graduates of the engineering programs should be able to:

d1- Demonstrate efficient IT capabilities. (D4)
d2- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A7, A20
B	Intellectual skills	B1, B7, B8
C	Professional and practical skills	C1, C5, C6
D	General and transferable skills	D4, D6

3 – Contents

Topic	Lecture hours	Tutorial hours
• Introduction	2	-
• Linear Programming	8	8
• Transportation Problems	6	6
• Assignment Problems	6	6
• Capacity Planning	6	8
• Revision	2	2
Total hours	30	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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1	1		1	1	1			1		1	1	1
	a2	1		1	1	1		1	1	1			1		1	1	1
Intellectual	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	c1	1	1	1	1	1		1		1			1		1	1	1
	c2				1	1				1			1		1		1
	c3			1	1	1		1	1	1						1	
General Tran	d1		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: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	-	-
Written Exam	Sixteenth week	70
Total		100

6- List of References

6-1 Course notes
Lecture Notes and Handouts

6-2 Required books:
Hiller& Liberman: Introduction to Operations Research, McGraw-Hill, Eighth Edition, 2005.

6-3 Recommended books: Non

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

7- Facilities Required for Teaching and Learning
Non

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M331: Thermo-Fluid Machinery
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering and Production Technology BSc Program

Department offering the program: Manufacturing Engineering and Production Technology Dept.

Department offering the course: Manufacturing Engineering and Production Technology Dept.

Date of specifications approval: September 2015

B - Basic information

Title: Heat Transfer   Code: M331   Year/level: 3-rd year / 1-st Term

Teaching Hours: Lectures: 4   Tutorial: 1   Practical: 1

                                     Total : 6

C - Professional information

1 – Course Learning Objectives

This course provides an enhanced level of theoretical and conceptual understanding of thermodynamics, fluid mechanics and heat transfer. In addition, a moderate understanding of how these disciplines apply to the design and analysis of complex thermal-fluid system is included.

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 thermo-fluid machinery (A1,A2).

  a2- The principles and fundamentals necessary for thermo-fluid machines design analysis (A3, A4).

  a3- The key parameters of design procedure of thermo-fluid machines at different modes of operation (A5, A14).

  a4- Thermodynamic and fluid mechanics analysis for evaluation of real power, ventilation and refrigeration systems performance (A13, A18).

B - Intellectual skill

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

  b1- Develop the mathematical analysis of different thermo-fluid machines and their operational problems (B1, B2, B3).

  b2- Conduct a detailed investigation on ways of improving basic thermo-fluid machines efficiency (B6, B9).

  b3- Analyze the performance of real power, ventilation and refrigeration systems and deducing their characteristic parameters (B5, B7)

C - Professional and practical skills

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

  c1- Analyze and test the performance of basic thermo-fluid systems (C2, C17).

  c2- Apply engineering and science fundamentals to real problem (C1, C4).

  c3- Formulate and solve open-ended problems (C1, C7).

  c4- Design programs and building software tools for systems analysis (C5, C6) .

  c5- Work in teams for achieving items c1 and c2 in a professional manner (C12, C13)

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, D9).

  d2- Communicate in written, oral and graphical forms (technical reports in standards and practice forms) (D3).

  d3- Demonstrate efficient IT capabilities through Microsoft office utilities (excel, power point, word) (D4).

  d4- Work in stressful environment and within constraints (D2, D5).

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A2, A3, A4, A5,A13, A14, A18
B	Intellectual skills	B1, B2, B3, B5, B6, B9
C	Professional and practical skills	C1, C2, C4, C5, C6, C7, C13, C17
D	General and transferable skills	D2, D3, D4, D5, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction to Thermo-Fluid Machinery	4	2	-
Fundamentals of Heat Exchangers	4	1	2
Mixture of Gases	8	2	1
Combustion and I.C.E.	8	2	2
Reversible Work and Availability	4	-	2
Air Compressors	8	2	2
Steam Turbines Engines	8	2	2
Gas Turbines	8	2	2
Fluid Machinery	8	2	2
Total hours	60	15	15

4- Teaching and Learning and Assessment methods:

Course ILO's			Lecture	Presentations and Movies	Discussions and seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1		1	1	1	1		1		1				1		1	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
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 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			
General Tran. Skills	d1				1		1			1							1	
	d2			1	1					1	1						1	
	d3		1	1						1							1	1
	d4		1	1	1					1								

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

6- List of References

6.1 Course notes
Lecture notes and handouts

6.2 Required books
- Metwally, M.H., "Selected topic in Thermo-fluid Machinery", Cairo, 2004
- Moran, M. J., and Shapiro, H. N., "Fundamentals of Engineering Thermo-dynamics", 4th Ed., J. Wiley & Sons, USA, Mar 1994.
- Fox, R. W., and McDonald, A. T., "Introduction to Fluid Mechanics", 5th Ed, J. Wiley & Sons, Inc., N.Y., USA, 1985.

6.3 Recommended books
- Eastop, T. D., and McConkey, A., "Applied Thermodynamics for Engineering Technology", 5th Ed, Pearson, Prentice Hall, UK, 1993.
- Incropera, F. P., and Dewitt, D. P., "Fundamentals of Fluid Mechanics", 6th Ed, J. Wiley & Sons, Inc., N.Y., USA, 2006.

6.4 Periodical, Web sites, etc.(needed to be readjusted)
- 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
- Thermodynamic Lab.
- Computer, Data show and Computer programs
- Students are required to use own PCs

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M351: Mechanics of Machines III
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Mechanics of Machines III   **Code:** M351   **Year/level:** 3rd year / 1st semester
Teaching Hours: **Lectures:** 2   **Tutorial:** 2
    Practical: --   **Total:** 4

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 operations of speed governors, essential of balancing of the rotating and reciprocating masses, and essential of balancing of rotating and reciprocating moments. He should be able to design the appropriate governor as well as analyze the engines and machines for balancing of forces and couples.

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 constructions and principles of operations of the basic types of speed governors. (A1, A4, A12)
a2- The mathematical relations regarding operation of speed governors. (A5)
a3- The sources of dynamic and static unbalance of rotating members (shafts, discs, and wheels…). (A12)
a4- The techniques of balancing of engines and rotating machines. (A13)
a5- The procedure of calculation of balancing masses necessary to balance the rotating members. (A18)

B - Intellectual skills
On successful completion of the course, the student should be able to:
b1- Select the proper speed governor for engines, shafts, rotating machines. (B2)
b2-Evaluate the unbalance in rotating and reciprocating machines. (B13, B15)
b3- Investigate the root causes of rotating and reciprocating unbalance and propose the appropriate ways for balancing. (B3, B12, B17)

C - Professional and practical skills
On successful completion of the course, the student should be able to
c1- Construct, test, and evaluate the performance of different types of speed governors. (C5)
c2- Use the force analysis techniques to modify design of machine parts. (C1, C2)
c3- Develop techniques for assessment of the balance of rotating & reciprocating machines.(C5, C12)

D - General and transferable skills
On successful completion of the course, the student should be able to:
d1- Search for information from diverse references and internet. (D3, D7, D8, D9)
d2- Write technical reports and perform the given arrangements. (D2, D6)
d3- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A4, A5, A12, A13, A18
B	Intellectual skills	B2, B3, B12, B13, B15, B17
C	Professional and practical skills	C1, C2, C5, C12
D	General and transferable skills	D2, D3, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours

• Speed Governors
 1- Common types of mechanical governors
   a) Watt governor (construction, calculations, performance)
   b) Porter governor (construction, calculation, performance)
   c) Hartnell governor (construction, calculation, performance)
 	
 2- Hydraulic governor (construction, performance)
 3- Electronic governor (layout, performance)
 4- Speed governor notations and specifications
	2
	4
	4
	
	2
	2
	1
		6
		6

• Balancing of rotating masses 1- Revolving in a single plane 2- Revolving in several planes	2 2	2 8
• Balancing of reciprocating masses 1- Evaluation of the Reciprocating masses in machines 2- Reciprocating forces and moments in single cylinder internal combustion engines 3- Reciprocating forces and moments in multi-cylinder internal combustion engines.	2 2 4	4 4
• Complete balancing of different engine types	3	
Total hours	**30**	**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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	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
Intellectu	b1	1															1
	b2	1			1	1							1		1		1
	b3								1		1						1
Applied	c1	1								1							1
	c2								1	1							1
	c3								1	1							1
General	d1								1	1							1
	d2								1	1							1
	d3									1							1

5- Assessment Timing and Grading:

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

6- List of References
6-1 Course notes

6-2 Required books
Khurmi R.S. "Theory of Machines", Eurasia Publishing House, 2014

6-3 Recommended books
Martin G.H. "Kinematics and Dynamics of Machines", Waveland Press, 2nd edition, 2002

6-4 Periodicals, Web sites, etc.
https://infinit.io/link/ashit/36xhQxq
www.pearsonhigher.com
www.udco.com

7- Facilities Required for Teaching and Learning
Data show

Course Coordinator: Assoc. Prof. Gaafar A. Hussein
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department
M352: Measuring Instruments& Instrumentation
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Measuring Instruments & Instrumentation   **Code:** M352   **Year/level:** 3-rd year / 2-nd Term
Teaching Hours: **Lectures:** 2   **Tutorial:** 1
  Practical: 1   **Total:** 4

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.
- Be able to 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-The measuring system's elements. (A4)
a2-The measuring units & characteristics. (A3)
a3-The different measuring sensors used for different mechanical   phenomenon (strain, stress, force, torque, power, pressure, temperature, viscosity and fluid flow). (A13)

B - Intellectual skills
By the end of the course the student should be able to:
b1- identify the instrument's characteristics. (B5)
b2- choose the instrument, suitable for the specified measured phenomenon. (B9)
b3- design, prepare and elaborate a simple experiment. (B17)
b4- Design a measuring system. (B14)
b5- Statistically treat the measurements.(B13, 14)

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. (C3)
c2- Build up measuring transducers utilizing different sensors convenient for the corresponding measurements. (C5)
c3- Measure the physical quantities by the previously mentioned devices. (C18, 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- Collaborate effectively to perform successful measurements. (D1)
d2- Plan and manage the tasks very well to overcome stressful environment and constraints. (D2)
d3- Prepare and report results of experiments. (D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A4, A13
B	Intellectual skills	B5, B9, B13, B14, B17
C	Professional and practical skills	C3, C5, C16, C18
D	General and transferable skills	D1, D2, D4

3 – Contents

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

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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	1	1		1
	a3	1	1		1	1	1		1	1			1	1	1		1
Intellectual	b1	1	1	1		1	1		1	1			1				
	b2		1	1	1	1	1	1	1	1			1				
	b3	1	1		1	1	1		1				1	1	1		1
	b4	1			1	1	1		1				1	1	1		1
	b5	1		1	1	1	1		1				1	1	1		1
Applied	c1		1	1	1	1	1		1					1	1		1
	c2		1	1	1	1	1		1					1	1		1
	c3		1	1	1	1	1		1					1	1		1
	c4	1		1	1	1	1		1				1	1	1		1
General	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 (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes
Lecture notes or handouts

6-2 Required books
- C.V. COLLETTE & A.D. HOPE, Engineering Measurements, the English Language Book Society & Pitman, 2nd. Ed., 1983;
- 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
Laboratory
Internet educational lab

Course Coordinator: Prof. Nabil Gadallah
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M360: Industrial Psychology
Course Specifications

A- Affiliation

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

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

Department offering the course: Manufacturing Engineering and Production Technology Department

Date of specifications approval: September 2015

B - Basic Information

Title: Industrial Psychology   **Code:** M360   **Year/level:** 3-rd year / 1-st Term

Teaching Hours: **Lectures:** 2   **Tutorial:** --

Practical: --   **Total:** 2

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.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- The role of industrial engineer. (A9)

a2- The structural system of human work. (A9)

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

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. (B4)

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

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

C - Professional and practical skills

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

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

c2- Make the best use of human abilities . (C1)

c3- Use the ergonomic factors in domestic and industrial products. (C9)

D - General and transferable skills

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

d1- Lead and manage effectively multidisciplinary team. (D5)

d2- Planning the efficient use of resources and time to fulfill tasks.(D6)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A9, A11
B	Intellectual skills	B4, B9
C	Professional and practical skills	C1, C2, C9
D	General and transferable skills	D5, D6

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 consideration	2	
Working conditions 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 – Exposer 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 Assessment methods:

	Course ILO's	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
				Teaching Methods						Learning Methods				Assessment Method			
Knowledge	a1	1	1	1	1				1				1		1	1	
	a2	1	1	1	1				1				1		1	1	
	a3	1	1	1	1				1				1		1	1	
Intellectual	b1	1	1	1	1	1		1	1				1		1	1	1
	b2	1	1	1	1	1		1	1				1		1	1	1
	b3	1	1	1	1			1	1				1		1	1	1
Applied	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							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	15
Written Exam	Sixteenth 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

> **www.socialpsychology.org/io.htm**
> **http://www.psych.umn.edu/research/areas/industrial/**
> www.ciop.net/

7- Facilities Required for Teaching and Learning: Non

Course Coordinator: Prof. Mamdouh Saber

Head of the Department: Dr. Abdelmagid A. Abdalla

Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M363: Manufacturing Technology I
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Manufacturing Technology I   **Code:** M363   **Year/level:** 3-rd year / 1-st Term
Teaching Hours: **Lectures: 3**   **Tutorial: 2**
                                Practical: 1   **Total: 6**

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:

a) Casting:
* Choose the Suitable molding sand   * Tests of molding sand
* Pattern design   * Gating system design * Riser design   * Melting Technology
* Metal pouring Technology * Defects of castings

b) Forming Technology:
* shearing – blanking and piercing – Bending – Drawing – Extrusion

c) Welding Technology

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- The technology of Casting. (A8)
a2- Balance of a melting furnace.(A1, A13)
a3- Calculation of the press capacity for shearing , blanking , piercing , drawing. (A1, A13, A3)
a4- How to choose suitable electrode , welding technology , welding current. (A1)

B - Intellectual skills

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

b1- Select the proper manufacturing method for a product. (B2, B18)
b2- Use the parts of stamp. (B2)
b3- Use of different kinds of presses of sheet metal work. (B13, B2)
b4- Use of different kinds of welding machines and welding tests.(B1, B2)

C - Professional and practical skills

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

c1- Analyze the casting defects and remedy. (C16, C5)
c2- Select the standard parts of the sheet metal work stamps. (C16, C5)
c3- Analyze the welding defects and its remedy. (C16, C5)

D - General and transferable skills

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

d1- Cooperate, Lead and motivate individuals. (D5)
d2- Arrange, manage resources and time to carry out the assigned tasks.(D1)
d3- Gather and exchange information, data with others. (D7)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A3, A8, A13
B	Intellectual skills	B1, B2, B13, B18
C	Professional and practical skills	C5, C16
D	General and transferable skills	D1, D5, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Casting processes	3	2	1
Molding sand properties , kinds	3	2	1
Tests	3	2	1
Gutting septum types and design	3	2	1
Risers types and design	3	2	1
Melting technology	3	2	1
Solidification of casting	3	2	1
Casting defects, cleaning , Inspection	3	2	1
Metal forming: shearing , blanking and piercing	3	2	1
Metal forming: bending , drawing Extrusion	3	2	1
Welding technology :			
Basic concepts	3	2	1
Solid phase welding	3	2	1
Fusion welding		2	1
Welding defects	3	2	1
Welding inspection	3	2	1
Total hours	**45**	**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1		1	1	1	1	1				1	1	1		1
	a2	1			1	1	1			1			1	1	1		1
	a3	1			1	1		1		1			1		1		1
	a4	1			1	1			1				1		1		1
Intellectual	b1	1	1		1	1	1		1	1			1	1	1		1
	b2				1									1			
	b3	1			1	1		1	1				1		1		1
	b4	1		1	1		1		1					1			
Applied	c1	1	1		1	1	1	1	1	1			1	1	1		1
	c2				1	1				1				1			
	c3	1	1		1	1	1	1	1	1			1	1		1	
General	d1		1			1	1			1				1		1	
	d2		1			1	1			1				1		1	
	d3		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	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

6-1 Course notes: Lecture notes

6-2 Required books:

Richard W. Loper, Carl R. Rosenthal and Philip C. Heine, Principles of metal Casting, McGraw Hill,

2nd edition, 1976

6-3 Recommended books: Non

6-4 Periodicals, Web sites etc.: Non

7- Facilities Required for Teaching and Learning

 a) Laboratory for testing the molding sand
 b) Medium frequency induction furnace of 20kg capacity
 c) Vitrasonic test for welding and casting inspection
 d) crank press of 50 ton

Course Coordinator: Assist. Prof. Ibrahim Mousa
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M364: Manufacturing Technology II
Course Specifications

A- Affiliation
Relevant program: Manufacturing Engineering & 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: Manufacturing Technology II **Code:** M364 **Year/level:** 3-rd year / 2-nd Term
Teaching Hours: **Lectures:** 3 **Tutorial:** 1
  Practical: 1 **Total:** 5

C - Professional Information
1 – Course Learning Objectives
The main objectives of this course are to introduce the theories of metal cutting, accompanying phenomena, gears manufacturing, and jigs and fixtures design 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 (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge and Knowledge and understanding ILOs:

a1- Principles of engineering technology, machining deviations, datum selection, dimensions chain analysis and solutions, linear measurement techniques, and gauges design (A1, A2)..

a2- Cutting tool materials, basic and technological cutting tool geometries (A3, A8, A13).

a3- Basic concepts of theories of metal cutting; including chip formation and accompanied phenomena, cutting forces in oblique and orthogonal cuttings, heat generation and cutting temperature, and cutting tools wear and T-v relationship. Studies of the effects of cutting parameters are also included when discussing deferent topics (A1, A2, A5, A6, A8, A12)

a3- How to determine optimum cutting conditions, calculation of productivities when roughing and finishing, as well as the calculation of associated machining costs (A1, A5, A8, A12)

a4- Basic methods of gears manufacturing and concepts jigs and fixtures designs (A2, A8, A12, A18).

B - Intellectual skills
By the end of the course the student should be able to:

b1- Evaluate accuracy and surface roughness (Design drawings), and consequently select proper process(es), and checking devices (B1, B2, B18)

b2- Select or even design cutting tools for specific applications (B4, B8)

b3- Select, analyze, and even optimize cutting conditions for specific roughing or finishing applications (B2, B18).

b4- Design of gauges required for specific quality control application (B2, B7)

b5- Apply the principle of production engineering economy in calculating manufacturing costs (B2, B4, B7).

b6- Analyze the effects of setting parameters on accuracy, surface finish, and subsurface alterations (B2, B4, B7).

b7- Analyze the effects of setting parameters upon forces, heat generation, and cutting tools wear (B2, B4, B7).

C - Professional and practical skills

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

c1- Solve problems related to accuracy and dimensions chains (C1, C2).

c2- Design gauges for specific applications (C1, C2).

c3- Design tools for specific applications (C2)

c4- Design the technological sequence of operations required for specific applications (C13, C14, C15, C19)

c5- Record, detects, and submits solutions associated with theoretical topics of the machining processes ((C1, C5, C10).

D - General and transferable skills

By the end of the course the student should be able to, and gain the following General and Transferable skills ILOs:

d1- Plan and control designer and manufacture engineers activities corporation (D1, D5,, D9).

d2- Incorporates activities of several manufacturing shops for certain specific production application (D1, D5, D2).

d3- Present findings in production workshops in simple and illustrative way (D1, D2, C9).

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A2, A3, A5, A6, A8, A12, A13, A18
B	Intellectual skills	B1, B2, B4, B7, B18
C	Professional and practical skills	C1, C2, C5, C10, C13, C14, C15, C19
D	General and transferable skills	D1, D2, D5, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction; Definition of machining system, manufacturing processes and elements of machining system.	2	1	
Machining Deviations; reasons, types, dimensional deviation and ISO system of tolerances, definitions and denotations of positional & geometric deviations, standardization and measurement of surface roughness.	6	1	2
Cutting tools failures, Cutting tools materials; classification and properties; tools geometries.	4	2	2
Chip formation; evaluation of amount of deformation using coefficient of chip upsetting, k, and shear angle. Study of the effects of cutting conditions upon k and ξ1.	6	1	2
Integrity of machined surfaces; Work hardening, residual stresses, and surface roughness	2		1
Cutting forces calculation in oblique and orthogonal cuttings, cutting forces measurement, and study of the effects of cutting conditions.	4	2	2
Heat generation when metal cutting, sources and heat distribution, and study of the effects of cutting parameters.	2	1	1
Cutting tools wear; types and curves of wear, Taylor's equation T-v relationship, and effects of cutting parameters.	4	2	1
Determination of optimum Cutting conditions; v, s, and t.	4	2	
Productivity when rough and fine metal cutting operations	2	1	1
Production costs determination	3	2	
Gears manufacturing; form and generating methods	3		2
Jigs and fixtures design	3		1
Total hours	**45**	**15**	**15**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
		Teaching Methods							Learning Methods				Assessment Method				
Knowledge	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
	a4	1	1		1	1			1				1		1	1	1
Intellectual	b1	1	1		1	1			1				1		1		1
	b2	1	1		1	1			1				1		1		1
	b3	1	1		1	1			1				1	1			1
	b4	1	1		1	1			1				1				1
	b5	1	1		1	1			1				1				1
	b6	1	1		1	1			1				1		1		1
	b7	1	1		1	1			1				1		1		1
Applied	c1		1		1	1							1		1		1
	c2	1	1		1	1			1				1		1	1	1
	c3	1	1		1	1			1				1		1	1	1
	c4	1	1		1	1			1				1		1	1	1
	c5		1		1	1			1				1		1	1	1
General	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 (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	60
Total		100

6- List of References

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

6-2 Required books:

Phillip F.Ostwald, Manufacturing Processes and Systems, 2nd Edition, John Wiley &Sons.Inc, ISBN: 0-471-0474-4, 1997.

6-3 Recommended books: Non

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

7- Teaching facilities

Lecture rooms, laboratory, and workshops.

Course Coordinator: M. Merdan, Ph. D.

Head of the Department: Dr. Abdelmagid A. Abdalla

Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M371: Machine Design I
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology
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:** M371 **Year/level:** 3-rd year / 2-nd Term
Teaching Hours: Lectures: 3 Tutorial: 0
Practical: 3 Total: 6

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 (A4).

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).

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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	Practical hours
• Introduction	2		2
• Mechanical Properties of Ductile Materials	2		2
• Stresses at a point	2		2
• Element & Principal Stresses	4		4
• Design for static strength	4		4
• Design for Dynamic strength	4		4
• Design of Pressed-on Joints	3		3
• Shaft Loading	3		3
• Shaft Design	3		3
• Design of Keys, Feathers & splines	3		3
• Design of Threaded Joints	3		3
• Design of Welded Joints	3		3
• Design of Riveted Joints	3		3
• Design of Helical Springs	3		3
• Revision	3		3
Total hours	**45**		**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1	1							1		1	1	1
	a2	1											1		1	1	1
	a3	1			1	1							1		1	1	1
	a4								1								
Intellectual	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	c1	1			1	1						1			1	1
	c2		1		1			1								1
	c3		1													1
	c4		1		1			1			1					1
General	d1		1		1			1			1			1	1
	d2		1	1	1			1								1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	10
Mid-Term Exam	6-th Week	10
Practical Exam	12th Week	20
Written Exam	Sixteenth week	60
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: Assistant Prof. Serage El-din Khalifa
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M399: Project I
Course Specifications

A- Affiliation

Relevant program:	Manufacturing Engineering & 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: Project I   **Code:** M399   **Year/level:** 3-rd year / 2-nd Term
Teaching Hours: **Lectures:** 1   **Tutorial:** --
                              Practical: 3   **Total:** 4

C - Professional Information

1 – Course Learning Objectives
A study of this course will enable the student to:
- Construction and executing simple component or equipment
- Using design and manufacturing technology in practical
- Problem solving by planning of time and facilities

2 - Intended Learning Outcomes (ILOS)

A- Knowledge and Understanding:
By the end of the project the student demonstrate knowledge and understanding of:
- a1- Realization and application of different concepts, principles and theories relevant to mechanical engineering, manufacturing and production technology . (A1, A13)
- a2- Actual constraints within which his/her engineering judgment will have to be exercised. (A14)
- a3- The specifications of machine parts and mechanical systems and application of CAD and CAD/CAM facilities. (A3, A15)
- a4- Contemporary issues and advancements in mechanical engineering and production technologies.(A8, A12, A16, A21)
- a5- Importance of basic electrical, control and computer engineering subjects related to production (A17)
- a6- Preparation of reports and presentations concerning project.(A10, A18)
- a7- Engineering design principles and techniques (A19)
- a8- Role of planning tasks and managing of time and resources. (A20)

B- Intellectual Skills
By the end of the project the student should be able to:
- b1- Use the principles of mathematics, science and technology to perform the assigned project. (B13)
- b2- Compare between technological processes to carry out the project. (B4, B14)
- b3- Use the principles of engineering science in developing solutions to practical problems of the project. (B16)
- b4- Select the proper manufacturing method to execute the project components. (B18)

C- Practical & Professional Skills
By the end of the project the student should be able to:
- c1- Communicate all the documents of the project as engineering drawings, computer graphics and specialized technical reports. (C7, C9, C13)
- c2- Employ the traditional and modern CAD and CAD/CAM facilities in design and production processes of parts. (C14)
- c3- Use basic workshop equipment safely in manufacturing processes. (C17, C15, C6)
- c4- Analyze experimental results and calibration processes and determine their accuracy and validity. (C16)

D- General and Transferable Skills

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

d1- Show the team work and effective communication of documents between the individuals. (D1, D3, D4, D5)

d2- Manage tasks, time, and resources considering the constraints effectively.(D6, D2)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A8, A10, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21
B	Intellectual skills	B4, B13, B14, B16, B18
C	Professional and practical skills	C6, C7, C9, C13, C14, C15, C16, C17
D	General and transferable skills	D1, D2, D3, D4, D5, D6

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Collection of technical data			
Technical report			
Design and technological procedure			
Presentation of Problem			
Problem solving			
Realization of design			
Testing and inspection			
Writing of technical report			
Follow up of technical work			
Assembly of components			
Presentation of producer			
Evaluation of producer quality			
Total hours	**15**		**45**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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		1	
	a3	1		1		1	1	1		1				1		1	
	a4	1		1		1	1	1		1				1		1	
	a5	1		1		1	1	1		1				1		1	
	a6	1		1		1	1	1		1				1		1	
	a7	1		1		1	1	1		1				1		1	
	a8	1		1		1	1	1		1				1		1	
Intellectual	b1	1			1		1	1	1					1		1	
	b2	1			1		1	1	1					1		1	
	b3	1			1		1	1	1					1		1	
	b4	1			1		1	1	1					1		1	
Applied	c1						1	1						1			
	c2						1	1						1			
	c3						1	1						1			
	c4						1	1						1			
Gener	d1		1	1				1									
	d2		1	1				1									

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	30
Mid-Term Exam	6-th Week	20
Practical Exam	-	100
Written Exam	Sixteenth week	
Total		150

6- List of References

6-1 Course notes   As requested

6-2 Required books   As requested

6-3 Recommended books   As requested

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 & Technology
Manufacturing Engineering and Production Technology Department

M400: Summer Training
Course Specifications

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: Summer Training   **Code:** M400   **Year/level:** 4th
Teaching Hours: **Lectures:**--   **Tutorial:**--
                                    Practical:--   **Total:** --

C - Professional information

1 – Course Learning Objectives:
Developing the practical skills in the field of mechanical 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- Applicability of theoretical knowledge gained during academic sessions (A20)
a2- Actual needs of business in the domain of specialization (A16)

B - Intellectual skills:
On successful completion of the course, the student should be able to:
b1- Develop the personal attitudes to serve the society (B10)
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, C2)

D - General and transferable skills:
On successful completion of the course, the student should be able to:
d1- Presenting personal qualities (D2)
d2- Communicate effectively by diverse ways (D1, D3)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A16, A20
B	Intellectual skills	B4, B10
C	Professional and practical skills	C1, C2
D	General and transferable skills	D1, D2, D3

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Practicing the actual production cycle			48
Total hours			48

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1			1					1		1						
	a2		1	1					1	1	1						
Intellectual	b1		1	1				1	1	1	1						
	b2		1	1				1	1	1	1						
Applied	c1							1									1	
General	d1		1	1					1	1	1						
	d2		1					1									1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)%
Summer training	Each summer	50
Evaluation of training	2nd term/4th year	50
Practical Exam	-	-
Written Exam	-	-
Total		100

6- List of references: 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

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Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M454: Production Management
Course Specifications

A- Affiliation

Relevant program:	Manufacturing Engineering & 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: Production Management   **Code:** M454   **Year/level:** 4-th year / 1-st Term
Teaching Hours: **Lectures: 3**   **Tutorial: 1**
    Practical: 2   **Total: 6**

C - Professional Information

1 – Course Learning Objectives
A study of this course will enable the student to:
- Study and analyze specific problems related to industrial management.
- Apply different mathematical techniques and deduce the best action to adopt in order to satisfy the objectives of the industrial enterprise.
- Plan ahead the different activities and inventory needs of industrial enterprises.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- Concepts of Decision theory, Forecasting techniques and Inventory theory. (A7, A20)
a2- How to establish production, process and resources strategy. (A7, A20)
a3- Methods of work measurement. (A7, A20)
a4- The concepts of Maintenance and Reliability. (A7, A20)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Analyze practical situations, construct mathematical models and deduce the best management decision or plan. (B8, B9)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Apply scientific techniques in decision making. (C1, C6)
c2- Plan ahead the different future activities and resource requirements for the Industrial Enterprises. (C6, C7)

D - General and transferable skills
By the end of the course the student should be able to:
d1- Search and find the proper model for real world problems. (D9)
d2-Use the modern software packages to solve problems. (D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A7, A20
B	Intellectual skills	B8, B9
C	Professional and practical skills	C1, C6, C7
D	General and transferable skills	D4, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Decision Theory	5		4
• Forecasting	5	2	4
• Aggregate Production Planning	5	2	4
• Short Term Scheduling	3	2	4
• Inventory Control	6		4
• Product & Process Strategy	4	2	2
• Resources Strategy	5	2	2
• Work Measurement	3		2
• Learning Objectives	3	2	2
• Maintenance & Reliability	3	2	2
• Revision	3	1	
Total hours	**45**	**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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1	1		1	1	1			1		1	1	1
	a2	1	1	1	1	1	1	1					1	1		1	1
	a3		1	1		1	1	1	1	1				1		1	
	a4	1	1	1	1		1	1	1	1				1		1	
Intellectual	b1	1	1	1	1	1	1	1	1				1	1	1	1	1
Applied	c1		1	1	1	1		1		1				1		1	
	c2		1	1				1	1				1	1		1	1
General	d1	1	1	1			1	1	1					1		1	
	d2		1	1	1	1	1	1	1	1				1		1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	15
Mid-Term Exam	6th Week	15
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

6- List of References

6-1 Course notes
Lecture Notes and Handouts

6-2 Required books : A.M.Kohail, "Selected Topics in Production Managements", Cairo, 2009.

6-3 Recommended books: William J.Stevenson, Production and Operations Management, McGraw-Hill, 2006

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

7-Facilities Required for Teaching and Learning: Non

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M461: System Dynamics & Vibrations
Course Specifications

A- Affiliation

Relevant program:	Manufacturing Engineering & 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: System Dynamics and Vibrations   **Code:** M461   **Year/level:** 4th year / 1st Semester
Teaching Hours: **Lectures:** 3   **Tutorial:** 2
                      Practical: 1   **Total:** 6

C - Professional Information

1 – Course Learning Objectives

The objective of this course is to enable the students understanding the basic concepts and theories of system dynamics and vibrations. He should be able to perform modeling and simulation of systems of different fields and implement the necessary designs and modifications of dynamic systems.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
On successful completion of the course, the student should demonstrate knowledge and understanding of:
a1- Basic concepts of system dynamics and vibrations. (A1)
a2- Basic equations and mathematical modeling of simple systems. (A1, A5, A13)
a3- The analogy between mechanical and electrical systems. (A17)
a4- The interactions between subsystems and their influence on proper design of systems. (A19)
a5- Prediction of system response in time and frequency domains. (A5)
a6- The critical constrains of systems. (A14)
a7- Vibration measuring techniques. (A12, A16, A21)
A8- Vibration control technologies. (A17)

B - Intellectual skills
On successful completion of the course, the student should be able to:
b1- Select proper assumptions of system model. (B1, B3)
b2- Deduce mathematical models for typical mechanical systems. (B7, B12, B13)
b3- Build system physical model with appropriate interactions with environment. (B17)
b4- Identify natural frequencies of systems at hand and study resonance phenomenon. Suggest solutions. (B22)
b5- Use efficiently appropriate methods of measurement. (B20)

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 engineering practice to solve problems related to the subject. (C1)
c2- Create mathematical or physical model for required system in terms of specifications. (C3)
c3- Study the effect of model parameters and assumptions. (C16, C17, C18)
c4- Suggest several possible solutions and clarify which solutions are feasible. (C2)
c5- Use the suitable software to carry out system analysis, calculate the system response and make improvements. (C6)
c6- conduct vibration measurements and assessment of technical conditions of equipment. (C5)

D - General and transferable skills

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

d1- Search for information from diverse references and internet. (D3, D7, D8, D9)

d2- Write technical reports and perform the given arrangements. (D2, D6)

d3- Effectively manage tasks, time, and resources. (D6)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5, A12, A13, A14, A16, A17, A19, A21
B	Intellectual skills	B1, B3, B7, B12, B13, B17, B20, B22
C	Professional and practical skills	C1, C2, C3, C5, C6, C16, C17, C18
D	General and transferable skills	D2, D3, D6, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical
• Introduction to system dynamics System Classifications (Mechanical, electrical, and hydraulic systems) and basic functions	3	3	
• Basic concepts of vibrating systems and the equations of motion of the vibrating elements.	4	3	
• Response of free vibrating systems with single and multiple degree of freedom	8	6	
• Response of single and multiple degree of freedom systems undergoing different forcing functions	10	8	
• MATLAB simulation (single degree of freedom systems)			6
• Mechanical-electrical and mechanical-hydraulic analogies.	6	6	
• Vibration control and absorbing techniques.	4	4	
• Vibration measurements	4		3
• Machine monitoring conditions using system dynamic analysis.	6		3
• MATLAB simulation (multiple degree of freedom systems)			3
Total hours	**45**	**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	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		1
	a6	1			1	1							1		1		1
	a7	1			1	1	1						1	1	1		1
	a8	1			1	1							1	1	1		1
Intellectual	b1	1											1		1		
	b2	1			1	1				1			1		1		1
	b3	1			1					1							1
	b4	1			1	1							1		1		1
	b5	1			1		1						1		1		1

Applied	c1	1			1	1					1		1		1
	c2								1						1
	c3	1			1	1			1						1
	c4				1	1									1
	c5				1	1				1					1
	c6					1									
General	d1									1					1
	d2			1											1
	d3			1						1					1

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	15
Mid-Term Exam	6-th Week	15
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

6- List of References

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

6-2 Required books: Rao S, Mechanical Vibrations, Third Edition, Addison-Wesley Publishing Co., 1995, ISBN 0-201-52686-7.

6-3 Recommended books: Ogata K, System Dynamics, 3rd, Prentice Hall, 1998

6-4 Periodicals, Web sites, etc.

  https://infinit.io/link/ashit/36xhQxq

  https://books.google.com.eg/books?id=l0kmBgAAQBAJ&pg.

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

  www.pearsonhigher.com

  www.udco.com

7- Facilities Required for Teaching and Learning

- Computer with MATLAB Software

- Data show

Course Coordinator: Assoc. Prof. Gaafar A. Hussein
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M462: Materials Technology II
Course Specifications

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

B - Basic Information
Title: Material Technology II   **Code:** M462   **Year/level:** 4-th year / 2-nd Term
Teaching Hours: **Lectures: 3**   **Tutorial: 1**

                                           Practical: 2   **Total: 6**

C - Professional Information
1 – Course Learning Objectives
A study of this course will enable the student to:
- Material Technology plays an important role in the advance of engineering technology. It is of extreme importance for most of engineering fields
- The main objective of this course is to introduce
- The basic concepts and theory of advanced materials technology
- Material selections
- Composite materials features and drawbacks
- Composite processing and fabrications

2 - Intended Learning Outcomes (ILOS)
A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- Engineering materials and composite materials. .(A3, A8, A12)
a2- Material selections for different applications. (A3, A8,)
a3- New methods for composite processing and fabrication. .(A3, A8, A12,)
a4- Polymer matrix composite constituents for low temperature applications. .(A3, A8, A12, A13).

B - Intellectual skills
By the end of the course the student should be able to:
b1- Design for manufacturing and product development. (B17, B18)
b2- Choose the most suitable metal substitute for structural application.(B2, B3).
b3- Design simple composite architecture MMC, CMC, and PMC. .(B2, B3, B7)
b4- Use the principles of composite architecture to analyze different material properties. (B12, B18)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Manufacture different laminated composite related wood, polymer or metal. .(C3, C8)
c2- Manufacture different particulate and fiber reinforced composite (C3, C8, C15)
c3- Manufacture different FGM composite (C3, C8, C15)
c4- Collect and record data and information related to composite manufacturing. .(C5, C15, C19)
c5- Study failure mode and effects analysis (FMEA) (C5, C17)

D - General and transferable skills
By the end of the course the student should be able to:
d1- collect, and categorize ideas and information in a predictable and standard format. .(D7)
d2- identify novel and/or original perspectives on the subject. .(D9)
d3- summarize key points from taken from a variety of standard sources. .(D3,D8)
d4- Present finding of scientific research in seminars and workshops. .(D3, D4)

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Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A8, A12, A13
B	Intellectual skills	B2, B3, B7, B12, B17, B18
C	Professional and practical skills	C3, C5, C8, C15, C17, C19
D	General and transferable skills	D3, D4, D7, D8, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Engineering materials (Types and applications)	3	2	2
• Materials selections		3	2
• Quantitative material selection	4		
• Concept of cost per unit property	4		
• Case study of metal substitutions	4		
• Materials for low temperature applications	2	3	
• Composite materials		4	2
• Raw materials for part fabrications	4		4
• Product development & Product life cycle	4		
• design for Manufacturing	4	3	4
• Manufacturing techniques			4
• Composite manufacturing	4		4
• Joining of Composite	4		4
• Recycling of composites	4		
• New trends in material technology	4		4
Total hours	**45**	**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	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1		1							1			
	a2	1			1												
	a3	1			1		1							1			
	a4	1			1		1							1			
	a5	1			1												
Intellectual	b1	1			1												
	b2	1			1		1							1			
	b3	1			1		1							1			
	b4	1			1		1							1			
Applied	c1	1			1		1							1			
	c2	1			1		1							1			
	c3	1			1												
	c4	1			1												
General	d1	1			1								1				
	d2	1			1								1				

d3	1			1								1			
d4	1			1								1			
d5	1			1		1							1		
d6	1			1											
d7	1			1		1							1		

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Weekly	10
Mid-Term Exam	Week 8	10
Practical Exam	Week 15	20
Written 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 , 2002.
- William D. Callister, Jr., and David G. Rethwisch "Materials Science and Engineering, An Introduction" Eighth Edition, John Wiley & Sons, Inc, 2009

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

7- Facilities Required for Teaching and Learning

Laboratory
Workshop

Course Coordinator: Prof. Dr. Bakr Mohamed Rabeeh

                                 Dr. Maher Khalifa

Head of the Department: Dr. Abdelmagid Abdelatif

Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M471: Machine Design II
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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:** M471   **Year/level:** 4-th year / 1-st Term
Teaching Hours: **Lectures:** 3   **Tutorial:** 0
                                  Practical: 4   **Total:** 7

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	D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Hydrodynamic bearings theory	6		8
• Hydrodynamic bearings design	3		4
• Rolling contact bearings	6		8
• Involute gear tooth	3		4
• Spur gears	6		8
• Helical gears	6		8
• Bevel gears	6		8
• Worm gears	6		8
• Revision	3		4
Total hours	**45**		**60**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1	1							1		1	1	
	a2	1											1		1	1	
	a3	1			1	1							1		1	1	
	a4								1				1				
Intellectual	b1	1			1	1							1			1	
	b2	1			1											1	
	b3	1			1	1							1			1	
	b4			1	1	1			1				1			1	
Applied	c1	1			1	1							1			1	
	c2			1		1			1							1	
	c3			1												1	
	c4			1		1			1				1			1	
Gener	d1			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: seminars, quizzes assignments and reports	Bi-Weekly	15
Mid-Term Exam	6-th Week	15
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

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: Assistant Prof. Dr. Serage El-din Khalifa
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M472: Computer Aided Design (CAD)
Course Specifications

A- Affiliation

Relevant program:	Manufacturing Engineering & 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 (CAD) **Code:** M472 **Year/level:** 4-th year / 2-nd Term

Teaching Hours: **Lectures: 3** **Tutorial: 0**

Practical: 4 **Total: 7**

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, A22)

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. (A8, A14, A15, A22)

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, B20)

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, C22)

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	A1, A2, A4, A8, A12, A13, A14, A15, A17, A18, A22
B	Intellectual skills	B1, B2, B5, B8, B11, B13, B15, B20
C	Professional and practical skills	C1, C2, C22
D	General and transferable skills	D4, D5

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
CHAPTER 1: An Overview of Computer-Aided Design and Analysis	3		4
CHAPTER 2: Review of Numerical Techniques for CAD	6		8
CHAPTER 3: Principles of Computer Graphics	6		8
CHAPTER 4: Computer Graphics and Design	6		10
CHAPTER 5: Overview of the Finite Element Method	6		10
CHAPTER 6: Elastic Stress Analysis by the Finite Element Method	9		12
CHAPTER 7: Design Optimization	9		8
Total hours	**45**		**60**

4 - Teaching and Learning and Assessment methods:

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

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Intellectual	b1	1			1						1		1		1
	b2	1			1	1					1		1	1	1
	b3	1	1	1	1		1		1		1	1		1	
	b4	1	1		1		1		1		1	1	1	1	1
	b5	1		1		1		1	1					1	1
Applied	c1	1	1		1	1	1				1	1	1	1	1
	c2	1			1						1		1	1	1
General	d1			1		1			1					1	
	d2		1	1					1	1				1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	20
Mid-Term Exam	6-th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

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.

6-4 Periodicals, Web sites, etc.

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. Nabil Gadallah
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M474: Machine Tool Design
Course Specifications

A- Affiliation
Relevant program: Manufacturing Eng. and Production Technology.
Department offering the program: Manufacturing Engineering and Production Technology Dept
Department offering the course : Manufacturing Engineering and Production Technology Dept.
Date of specifications approval : September 2015

B - Basic information
Title: Machine Tool Design   **Code:** M474   **Year/Level** : 4th /2nd Semester
Teaching Hours: **Lectures:** 4   **Tutorial:** 2   **Total : 6**

C - Professional information
1- Course Learning objectives:
A study of this course will enable the student to:
- Recognize the General Principles of Machine Tool Design.
- Learn the basics of regulation of speed & feed rates
- Understand different designs of Machine Tool Structures, Guide-ways & Power Screws, Spindles and Spindle Supports
.

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 working and auxiliary motions, machine tool drives, hydraulic transmission and mechanical transmission and their elements. general requirements of machine tool design.(A1, A13, A19)
a2- The aim of speed and feed rate regulation, stepped regulation of speed: design of speed box & design of feed box. Step less regulation of speed and feed rates. (A4)
a3- Design criteria for machine tool structures, static and dynamic stiffness, profiles of machine tool structures. (A4, A19)
a4- The functions and types of guide-ways, design of slide-ways, guide-ways operating under liquid friction conditions, design of anti-friction guide-ways. Design of power screws. (A1, A19)
a5- The functions of spindle unit and requirements, materials of spindles, effect of machine tool compliance on machining accuracy, design calculations of spindles, anti-friction bearings and sliding bearings.(A14)

B - Intellectual skills:
By the end of the course the student should be able to:
b1- Choose the appropriate basic working and auxiliary motions in machine tools and the suitable transmission system. (B2, B4, B13)
b2- Compare between the appropriate speed and feed rate regulation, and to design the speed and feed box. (B4)
b3-Investigate the appropriate functions of machine tool structures and their requirements from points of views of materials, static and dynamic stiffness and profiles. Design criteria for machine tool structures.(B9)
b4- Analyze the suitable material of spindle unit and requirements, design calculations of spindles, anti-friction bearings and sliding bearings.(B1)
b5- Use the knowledge from the different courses to solve design problems.(B13)

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C - Professional and practical skills:

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

c1- Solve simple problems concerning Strength of Material and Machine Element Design. (C2, C14)

c2- Elaborate a small project to Design a small Machine Tool with limited parameters.(C13, C15)

c3- Develop simple and effective computer programs to design a small Machine Tool with limited parameters.(C5, C6)

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- Demonstrate efficient IT capabilities.(D4)

d3- Lead and motivate individuals (D5)

d4- Search for information (discussions, magazines, library and websites) .(D7)

Course Contribution in the Program ILO's

	ILO's	Program ILO's
A	Knowledge and understanding	A1, A4, A13, A14, A19
B	Intellectual skills	B1, B2, B4, B9, B13,
C	Professional and practical skills	C2, C5, C6, 13, C14m C15
D	General and transferable skills	D1, D4, D5, D7

3 – Contents

Topics		Lecture hours	Tutorial hours
Introduction to Machine Tool Systems		4	2
Chapter 1	Machine Tool Drives & Mechanisms	8	4
Chapter 2	Regulation of Speed & Feed Rates	16	8
Chapter 3	Design of Machine Tool Structures	8	4
Chapter 4	Design of Guide-ways & Power Screws	12	6
Chapter 5	Design of Spindles and Spindle Supports	8	4
Chapter 6	Control Systems in Machine Tools	4	2
Total hours		60	30

4 - Teaching and Learning and Assessment methods:

Course ILO's		Teaching Methods							Learning Methods				Assessment Method				
		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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		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
Intellectual	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		1
	b4	1	1	1	1	1			1	1			1		1		1
	b5	1	1	1	1	1			1	1			1		1		1

Applied	c1	1	1	1				1	1	1							1	
	c2		1	1				1	1	1							1	
	c3		1	1				1	1	1							1	
General	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: seminars, quizzes assignments and reports	Bi-Weekly	30
Mid-Term Exam	6-th Week	20
Practical Exam	-	-
Written Exam	Sixteenth week	100
Total		150

6- List of references:

6-1 Course notes :   Lecture notes prepared by the instructor

6-2 Required books:
- N K MEHTA, Machine Tool Design and Numerical Control, Mc-GrawHill, NEW DELHY 2005 ISB No -07-462237-4.
- N.ACHERKAN.D. MIR PUBLISHERS, MACHINE TOOL DESIGN, MOSCOW,VOL,1,2,3. 1969.

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

Course coordinator: Assoc. Prof.Dr. Ahmed EL-Sanabary .
Head of the Department: Dr. Abdelmagid A. Abdalla
Date :   September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M481: Manufacturing Technology III
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Manufacturing Technology III **Code:** M481 **Year/level:** 4-th year / 1-st Term
Teaching Hours: **Lectures: 4** **Tutorial: 2**
 Practical: 2 **Total: 8**

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; plastic molds, and sheet metals, forging, and drawing dies. Also, to program and use CNC lathes and milling machines in the manufacturing of their geometrically difficult to produce cores, cavities as well as other associated complicated shape parts.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- Definition, classification, and properties of plastic materials. (A1, A3, A24)
a2- Design considerations of plastic products,(A4, A19)
a3- Plastics molding processes. (A13. A21)
a4- Types of plastic molds. (A1)
a5- Plastic injection molds design. (A1, A13)
a7- Sheet metals dies design. (A1, A13)
a8- Forging and deep drawing dies.(A1, A13)
a9- Programming of CNC lathes. (A1, A15, A22)
a10- Programming of CNC milling machines. (A22)
a11- The available software packages, in design and manufacture of molds and dies. (A19)

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. (B15)
b2- Evaluate plastic sheet metal products and introduce the proper design dies needed their cutting and/or forming (B15)
b3-Evaluate metal products and introduce the proper designs of dies needed for their manufacturing by forging or deep drawing. (B15)
b4- Evaluating the molds or dies and writing programs of for CNC milling or turning of their geometrically complicated parts (B15)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Design and manufacture of different sheet metal dies (C3, C5,C10, C13)
c2- Design and manufacture of different deep drawing dies (C3, C5,C10, C13)
c4- Design and manufacture of different forging dies (C3, C5,C10, C13)
c5- Design and manufacture of different plastics injection molds (C3, C5,C10, C13)
c6- Writing programs for CNC milling and turning.(C14)

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D - General and transferable skills
By the end of the course the student should be able to:
 d1- Lead and motivate working groups.(D5)
 d2- Work within multi-disciplinary team. (D1, D2)
 d3- Present finding of in written and oral forms. (D3)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A4, A13, A15, A19, A21, A22, A24
B	Intellectual skills	B15
C	Professional and practical skills	C3, C5,C10, C13, C14
D	General and transferable skills	D1, D2, D3, D5

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Definition, classification, and properties of plastic materials,	2	2	
Design considerations of plastic products,	2		
Plastics molding processes, and types of plastic molds,	2	4	
Plastic injection molds design,	10	8	
Sheet metals dies design,	6	10	
Forging and deep drawing dies.	6	6	
Programming of CNC lathes,	12		12
Programming of CNC milling machines.	12		12
Using the available software packages, in design and manufacture of molds and dies	8		6
Total hours	**60**	**30**	**30**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
				Teaching Methods					Learning Methods				Assessment Method				
Knowledge	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
	a4	1	1		1	1		1	1				1	1	1		1
	a5	1	1		1	1		1	1				1	1	1		1
	a6	1	1		1	1	1		1				1	1	1		1
	a7	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
	a10	1	1		1		1	1	1				1	1	1	1	1
	a11	1	1		1		1	1	1				1	1	1	1	1
Intellectual	b1	1	1		1	1		1	1				1	1	1	1	1
	b2	1	1		1	1		1	1				1	1	1	1	1
	b3	1	1		1	1		1	1				1	1	1	1	1
	b4	1	1		1	1		1	1				1	1	1	1	1

Applied	c1	1	1		1	1	1	1	1				1	1	1		1
	c2	1	1		1	1	1	1	1				1	1	1		1
	c3	1	1		1	1	1	1	1				1	1	1		1
	c4	1	1		1	1	1	1	1				1	1	1		1
	c5	1	1		1	1	1	1	1				1	1	1		1
	c6	1	1		1	1	1	1					1	1	1	1	1
General	d1	1	1		1		1	1								1	
	d2	1	1		1		1	1								1	
	d3	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	15
Mid-Term Exam	6th Week	15
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

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; None

6-4 Periodicals, Web sites, etc. None

6-5 Technological Tables, None

7- Facilities Required for Teaching and Learning

CNC Lab

Course Coordinator: Dr. Mohammad Merdan, & Dr. Atif Afifi
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: November 2011

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

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**M482: Automatic Control
Course Specifications**

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A- Affiliation
Relevant program: Manufacturing Engineering & 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:** M482 **Year/level:** 4th year / 2nd semester
Teaching Hours: **Lectures:** 3 **Tutorial:** 2
 Practical: 2 **Total:** 7

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 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	
o Instruments, sensors and controllers			10
o Level control			4
o Flow control			4
o Speed control			4
o Temperature control			4
o 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 PID controllers	3	2	
Total hours	**45**	**30**	**30**

4 – Teaching, 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
	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.	c1						1				1			
	c2	1			1	1			1	1		1	1	1
	c3	1	1		1							1	1	1
	c4						1				1		1	
General	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	15
Mid-Term Exam	6-th Week	15
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	100
Total		150

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 & Technology
Manufacturing Engineering and Production Technology Department

M552: Operations Research
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Operations Research   **Code:** M552   **Year/level:** 5-th year / 1-st Term
Teaching Hours: **Lectures: 2**   **Tutorial: 2**
                                   Practical: --   **Total: 4**

C - Professional Information

1 – Course Learning Objectives
A study of this course the student should acquire the following knowledge and understanding:
- The decision making processes and supporting tools
- The proper decision making model for the real problem and carry out the necessary study to cultivate the model with the relevant parameters
- The solution techniques and exercise different methods of solution including available tools and educational software.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- Analyze decision making problems (A1, A14)
a2- Build different decision making mathematical models (A1, A5)
a3- Solve the model either by hand (simple application) or using the available computer based
    algorithms. (A1, A5)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Analyze real Decision Making problems (B1, B5)
b2- Identify the proper mathematical models (B1,B3)
b3- Formulate the model and supply the real problem parameters B2, B7)
b4- Solve the model and find out the optimum decision using different techniques.(B1,B3, B11)
b5- Point out the best decision to adopt in actual projects. (B7, B11)

C - Professional and practical skills
By the end of the course the student should be able to:C1, C3
c1-Build mathematical model simulating real life problems C7
c2- Solve simple problems using mathematical techniques C14
c3- Solve fairly complicated problems using educational software C17

D - General and transferable skills
By the end of the course the student should be able to:
d1- Search for information in the Internet D4
d2-Demonstrate efficient IT capabilities.D7

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Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A5, A14
B	Intellectual skills	B1, B2, B3, B5, B7, B11
C	Professional and practical skills	C1, C3, C7, C14, C17
D	General and transferable skills	D4, D7

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Linear Programming Review	2	2	
• Integer Linear Programming Review	2	2	
• Nonlinear Programming	4	4	
• Goal & Dynamic Programming	2	2	
• Replacement Theory	4	2	
• Modeling & Simulation	4	4	
• Decision Theory Review	2	2	
• Queuing Theory	4	2	
• Games Theory	4	2	
• Revision	2	2	
Total hours	**30**	**30**	

4 - Teaching and Learning and Assessment methods:

	Course ILO's	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
				Teaching Methods					**Learning Methods**				**Assessment Method**				
Knowledge	a1	1	1		1	1			1				1		1		1
	a2	1	1		1	1			1				1		1		1
	a3	1	1		1	1			1				1		1		1
Intellectual	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
	b4	1	1	1	1	1			1				1		1		1
	b5	1	1	1	1	1			1				1		1		1
Applied	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
Gener	d1			1				1	1	1						1	
	d2			1				1	1	1						1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	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: Lecture Notes and Handouts

6-2 Required books: Hamdy A. Taha, Operations Research: An Introduction, 9th Edition, MacMillan Publisher Co., 2010.

6-3 Recommended books: Non

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

7- Facilities Required for Teaching and Learning

Students are required to use own PCs, Educational Software is given

Course Coordinator: Dr. M. S. Abdelkarim
Head of the Department: Dr. Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Mechanical Engineering Department

M561: Engineering Economy
Course Specifications

A- Affiliation

Relevant program: Computer Engineering & Information Technology BSc. program
Electronic Engineering & communication Technology BSc. program
Manufacturing Engineering & Production Technology BSc. program

Department offering the program: Computer Engineering & Information Technology Department
Manufacturing Engineering and Production Technology Department
Electronic Engineering & communication 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:** M561   **Year/level:** 5th year / 1st Term

Teaching Hours: **Lectures: 2**   **Tutorial: 2**
Practical: --   **Total: 4**

C - Professional Information

1 – Course Learning Objectives

This course provides the student with the essential mathematics of money investment, and understanding of the comparing different variants of solutions and choosing the best of them according to a certain criterion. In addition, the course focused on pointing out on the effect of both depreciation and taxes on comparison of variants.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:

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 worth, present worth, and rate of return. (A2)

a4- The role of accounting besides the effects of both depreciation and taxes as well on economic evaluations. (A7)

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. (B1)

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- Writing clearly using graphics effectively for justifying solutions to engineering economics problems. (C6)

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
B	Intellectual skills	B1,B2,B7,B8
C	Professional and practical skills	C1,C5,C6, C7,C9
D	General and transferable skills	D1, D2, D3, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Cash Flow	2	2	
Simple &Compound Interest-Types of payments	6	6	
Time Value of Money	2	2	
Nominal and Effective Interest	2	2	
Equivalence	4	4	
Engineering Problem Analysis:	6	6	
Depreciation	4	4	
Taxes Effect	4	4	
Total hours	**30**	**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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	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	
Intellectual	b1	1	1		1	1							1		1		
	b2	1			1	1							1		1		
	b3	1	1		1	1											
	b4	1	1		1	1							1		1		
Applied	c1	1	1		1	1				1			1		1	1	
	c2	1			1	1				1			1		1	1	
	c3	1		1	1	1				1			1		1	1	

General	c4	1		1	1	1				1		1		1	1	
	c5		1		1	1				1					1	
	d1	1	1	1							1		1		1	1	
	d2		1	1				1							1	
	d3		1	1				1							1	
	d4		1	1				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	-
Practical Exam	-	-
Written Exam	Sixteenth week	35
Total		50

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, 15th ed., Prentice Hall, 2012.
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, Educational Software is given

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department
M571: Computer Aided Manufacturing (CAM)
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology
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 manufacturing (CAM) **Code:** M571 **Year/level:** 5-th year / 1-st Term
Teaching Hours: **Lectures:** 3 **Tutorial:** 1
 Practical: 2 **Total:** 6

C - Professional Information

1 – Course Learning Objectives

A study of this course will enable the student to:

- Recognize the need of using computers as a tool in the manufacture engineering.
- Learn the basics of computer aided manufacturing and computer numerical control.
- Understand the advanced techniques of part programming in terms of the various steps needed to be taken for completing a successful CNC part program.
- Use specialized computer packages in computer aided manufacturing (wincts and wincam)
- Illustrate the potential applications of computer aided manufacturing in a variety of production engineering applications.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding

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

a1- Identification the basics of computer aided manufacturing. (A15, A21, A22)
a2- The advanced techniques of computer numerical control.(A22)
a3- The use of parameters in part programs (A13)
a4- The need for group technology (GT).(A20)
a5- The concept of computer aided process planning. (A15)
a6- The different approaches used in computer aided process planning CAPP application (A21)
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 (A5)
a9- The techniques utilized in developing CAPP systems (A21)

B - Intellectual skills

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

b1- Program parts using polar coordinates (B1)
b2- Use of parameters in developing part programs (B12)
b3- Develop programs using looping such as IF and DO (B13)
b4- Use subroutines and special canned cycles that can utilize the part geometry information directly to create complex part programs (B17)
b5- Use geometric transformation such as mirroring and scaling to exploit the symmetry in part geometry (B17)
b6- Appreciate the need for group technology (GT) as a means 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 (B10)
b7- Appreciate the need for computer aided process planning (CAPP) (B12)

C - Professional and practical skills
By the end 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, C14)
  c3- Use the available CNC machines for the manufacturing of turned and milled parts.(C15)
  c4- Develop advanced part programs to manufacture different mechanical parts. (C14)
  c5- Use the available simulation software to verify the developed part programs.(C6)

D - General and transferable skills
By the end of the course the student should be able to:
d1- Working a team work (D2)
d2- Use IT capabilities efficiently (D4)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A5, A13, A15, A20, A21, A22
B	Intellectual skills	B1, B10, B12, B13, B17
C	Professional and practical skills	C1, C5, C6, C14, C15
D	General and transferable skills	D2,D4

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Fundamentals of CAM	3		
Part programming using tool compensation (length and radius)	4	1	2
Canned cycles of CNC milling	6	2	4
Canned cycles of CNC turning	6	2	4
Subprogram techniques for CNC part programming	5	2	4
Introduction to computer Aided Part Programming	3	1	2
Computer Aided Part Programming of Milled parts	6	2	4
Computer Aided Part Programming of Turned parts	6	2	4
Computer Aided Process Planning	6	3	6
Total hours	**45**	**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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1	1	1	1		1					1	1	1	
	a2	1	1				1		1	1					1		1
	a3	1		1	1	1		1	1				1		1		1
	a4	1	1					1	1							1	
	a5	1	1		1	1		1		1			1		1	1	1
	a6	1	1	1	1	1		1	1				1		1		1
	a7	1	1		1	1		1	1				1		1		1
	a8	1	1	1	1	1	1	1	1				1	1	1		1
	a9	1	1		1			1					1		1	1	1
Intellectu	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

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	b4	1	1		1	1			1			1		1		1
	b5	1	1		1	1			1			1		1		1
	b6	1	1		1	1			1			1		1		1
	b7	1	1	1					1					1	1	1
Applied	c1	1				1	1	1				1		1		
Applied	c2	1	1		1	1		1	1			1		1	1	1
Applied	c3					1						1				
Applied	c4					1						1				
Applied	c5	1				1	1					1				1
General	d1		1	1		1	1	1	1			1			1	
General	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	15
Mid-Term Exam	6th Week	15
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

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. , 2002
- 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 A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M573: Automation
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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   **Code:** M573   **Year/level:** 5-th year / 1-st Term
Teaching Hours: **Lectures: 4   Tutorial: 1**
                         Practical: 1   Total: 6

C - Professional Information

1 – Course Learning Objectives
The main objective of this course is to introduce the basic concepts and applications
of automation in production lines

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- Basic requirements of automated flow lines and line balancing analysis, A3,A8
a2- Automated assembly systems and material handling, A13
a3- Numerical control and robot applications in flow lines A15
a4- Group technology and FMS A3, A13
a5- Sensors classifications, sequential control and PLC applications A17

B - Intellectual skills
By the end of the course the student should be able to:
b1- Analyze the automated flow production lines , B5, B9
b2- Apply linear feed-back control for automated production lines, B9
b3- Consider the applicability, economy of automation, B14 .
b4- Use the principles of line balancing for assembly operations, B15
b5- Investigate how to improve the production lines by automation, B17

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Investigate the performance of typical automated flow lines, C5, C6
c2- Employ the techniques for line balancing of automated production lines, C7, C8
c3- Use the suitable applications of PLC for automation, C14
 c4- Use Programming language for robot motion control C17

D - General and transferable skills
By the end of the course the student should be able to:
d1- Communicate with others, and work in team, D1, D3.
d2- Search for information in references and internet and Refer to relevant literature effectively, D6.
d3- Write technical report and prepare convenient presentation.D7, D9

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A8, A13, A15, A17
B	Intellectual skills	B5, B9, B14, B15,B17
C	Professional and practical skills	C5, C6, C7, C8, C14, C17
D	General and transferable skills	D1, D3, D6, D7, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction, automation economics	4	2	2
• Analysis of automated flow lines	4	2	2
• Automated assembly lines	4	-	-
• Line balancing of production lines	8	1	1
• Numerical control in production systems	4	1	1
• Industrial robots and FMS	6	1	1
• Automated material handling & inspection	4	1	1
• Group technology and production cells	6	2	2
• Linear feed-back control systems)	4	1	1
• Sequential control and PLC applications	8	2	2
• Sensors applications in automated prod. lines	4	1	1
• CIM and automated factory	4	1	1
Total hours	**60**	**15**	**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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1		1	1		1	1				1		1		1
	a2	1	1		1	1		1	1				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	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
	b4	1	1		1	1		1	1				1		1		1
	b5	1	1		1	1		1	1				1		1		1
Applied	c1	1	1		1	1	1	1	1				1	1	1		1
	c2	1	1		1	1	1	1	1				1	1	1		1
	c3	1	1		1	1	1	1	1				1	1	1		1
	c4	1	1		1	1	1	1	1				1	1	1		1
General	d1		1	1			1	1						1	1		
	d2		1	1			1	1						1	1		
	d3		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	15
Mid-Term Exam	6th Week	15
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

6- List of References
6-1 Course notes
None.
6-2 Required books :
"A.M.KOHAIL", "Selected topics in Automation", CAIRO, 2009
6-3 Recommended books
Mikell P. Groover," Automation of Production systems" Printce Hall Inc, 2001

6-4 Periodicals, Web sites, etc.: Non.
7- Facilities Required for Teaching and Learning
- Computer data show.
- Education movies.
- Non-traditional manufacturing lab

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M574: Quality Control
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology
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: Quality Control   **Code:** M574   **Year/level:** 5-th year / 2-nd Term
Teaching Hours: **Lectures: 2**   **Tutorial: 2**
                                    Practical: 2   **Total: 6**

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.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- The fundamental of statistical quality control. (A1, A5)
a2- The methods, and plans used for acceptance sampling. (a6, A10)
a3- The concept of quality improvement. (A20, A21, A24)
a4- Total quality management implementation.(A6, A7)

B - Intellectual skills
By the end of the course the student should be able to:
b1- Develop quality improvement techniques for production lines. (B2, B3, B6, B7, B8)
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. (BB11)

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- Demonstrate quality control charts for quality improvement. (C10)
 c3- 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	A1, A5, A6, A7, A10, A20, A21, A24
B	Intellectual skills	B2, B3, B4, B5, B6, B7, 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	2	2
• Quality improvement techniques	2	2	2
• Total quality management (TQM)	2	2	2
• Quality cost	2	2	2
• Fundamentals of statistics and quality	2	2	2
• Control charts for variables	4	4	4
• Fundamentals of probability and quality	4	4	4
• Control charts for attributes	4	4	4
• Acceptance sampling plans	2	2	2
• Acceptance sampling systems	2	2	2
• Reliability and quality	2	2	2
• Computers and quality control	2	2	2
Total hours	**30**	**30**	**30**

4 - Teaching and Learning and Assessment methods:

	Course ILO's	Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
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
	a4	1	1	1									1		1		1
Intellectual	b1	1			1	1	1		1				1		1		1
	b2	1	1		1	1	1		1				1		1		1
	b3	1			1	1	1		1				1		1		1
	b4	1	1	1									1		1		1
Applied	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
General	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	6th Week	10
Practical Exam	13th 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, eighth edition 2009.

6-4 Periodicals, Web sites, etc.

7- Facilities Required for Teaching and Learning

- Computer lab equipped with required software.

Course Coordinator: Dr. M. S. Abdelkarim
Head of the Department: Dr, Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M576: Computer Integrated Manufacturing (CIM)
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & Production Technology
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 Integrated Manufacturing (CIM) **Code:** M576 **Year/level:** 5-th year / 2-nd Term
Teaching Hours: **Lectures:** 2 **Tutorial:** 2
 Practical: 2 **Total:** 6

C - Professional Information

1 – Course Learning Objectives
A study of this course will enable the student to:
- Understand the CIM implementation strategies and Illustrate the potential applications
- Learn the meaning of lean manufacturing and the methods for implementing lean manufacturing
- Understand the needs of discrete part manufacturing
- Understand the definition and concept of operation of FMS and the type of equipment used in FMS.
- Appreciate the various functions that can be enhanced using of DNC and enhanced DNC functions.
- Make preliminary estimations for robot cell designs
- Understand AS/RS as a storage system and advantages of using that.
- Learn about the different types of flexibilities and their relevance to manufacturing

2 - Intended Learning Outcomes (ILOS)
A - Knowledge and understanding
a1- The historical development of CIM and the benefits that can be achieved by integration, A1
a2- The basics of computer integrated manufacturing, A2
a3- The advanced techniques of computer integrated manufacturing., A3
a4- The FMS control requirements, A8
a5- The need for material handling., A13
a6- The principles on which AGVs operate , A3
a7- The concept of adaptive control, A17.
a8- The advantages of using DNC, A19
a9- The different parts of a robot and their functions, A8
a10- The different types of robot programming methods used, A21
a11- The manufacturing strategies and the need for integration, A23

B - Intellectual skills
By the end of the course the student should be able to:
b1- Learn about the guidance principles used in AGV, B5
b2- Identify different types of AGV systems (AGVS) that are used in manufacturing systems, B14
b3- Design the AGV system for a given application, B15
b4- Develop programs for material handling using robot programming methods., B16
b5- Identify the various types of sensors used in robots ,B18
b6- Appreciate the need for adaptive control technique as a means of improving the quality of products. B20

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C - Professional and practical skills

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

c1- Learn the methods utilized for entering geometric information into wincam, C14

c2- Use the various tool path generation modules within wincam through which the CNC part programs can be generated, C14

c3- Write programs for machining centers as well as turning centers using wincam, C14

c4- Use the available CNC machines for the manufacturing of turned and milled parts., C17

c5- Develop advanced part programs to manufacture different mechanical parts C17.

c6- Use the available simulation software to verify the developed part programs. C17

D - General and transferable skills

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

d1- Working a team work, D1, D2

d2- Acquire the ability to interface computer with the CNC machine and Rebotics., D6

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1,A 2, A3, A8, A13, A17, A19,, A21, A23
B	Intellectual skills	B%, B14, B15, B16, B18, B20
C	Professional and practical skills	C14, C17
D	General and transferable skills	D1, D2, D6

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Fundamentals of CIM	2		
Material Handling Systems	2	6	
Automatic Guided vehicles	4		
Robotics	4	6	6
Flexible Manufacturing systems	4	6	
Adaptive control of manufacturing systems (FMS)	4		
On-Line Monitoring	4		
Just-In-Time (JIT)	2		
Direct Numerical Control (DNC)	2		
Part programming using different controller	2	6	12
Computer aided part programming		6	12
Total hours	**30**	**30**	**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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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	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

Intellectual	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	1
	b4	1	1		1	1		1	1			1		1	1	1
Applied	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.	d1		1						1				1		1	
	d2		1						1				1		1	
	d3		1						1				1		1	
	d4		1						1				1		1	
	d5		1						1				1		1	
	d6		1						1				1		1	
	d7														1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	15
Mid-Term Exam	6th Week	15
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

6- List of References

6-1 Course notes
None.

6-2 Required books:
- RAO, P. N., CAD/CAM Principles and applications, McGraw-Hill publishing Company Limited, 2004
- Radhakrishnan P and Subramanyan S, CAD/CAM/CIM, New Age International Ltd. Publishers, 1994.

6-3 Recommended books: Non

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

7- Facilities Required for Teaching and Learning
- Computer lab equipped with required software.

Course Coordinator: Dr. Atif Afifi
Head of the Department: Dr, Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Mechanical Engineering Department

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M578: Hydraulic Power Systems
Course Specifications

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A- Affiliation
Relevant program: Manufacturing Engineering and Production Technology BSc Program
Department offering the program: Manufacturing Engineering and Production Technology Dept.
Department offering the course: Manufacturing Engineering and Production Technology Dept.
Date of specifications approval: September 2015

B - Basic information
Title: Hydraulic Power System   **Code:** M578   **Year/level:** Fifth/first Semester
Teaching Hours: **Lectures:** 3   **Tutorial:**2
                             Practical: 2   **Total:** 7

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.	2		
➢ Introduction to hydraulic power systems and standard symbols	2	2	2
➢ Hydraulic fluids; properties and their effect on the system performance.	4	2	2
➢ Hydraulic transmission lines and connectors	2	2	2
➢ Hydraulic pumps:		4	4
• Classification and basic mathematical relations	2		
• Gear pumps, vane pumps and piston pumps	4		
• Fixed and variable displacement pumps and pump control	2	2	2
➢ Control valves		2	2
• Classification and basic design	2		
• Pressure control valves (direct/pilot operated); relief valves, pressure reducers, sequence valves and accumulator charging valves	4	2	2
• Directional control valves	2	2	2
• Flow control valves	2		
• Check valves	2		
➢ Hydraulic actuators; cylinders, motors and rotary actuators	2	2	2
➢ Accessories; accumulators, filters, reservoirs, pressure switches,…etc	2	4	2
➢ Case studies; design and analysis of function of hydraulic circuits of industrial and mobile systems.	2		6
➢ Mini project; design and analysis of the hydraulic system for an industrial application. Analysis of the possible operational problems...	6	4	2
➢ Seminar	3	2	
Total hours	**45**	**30**	**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 Simulation	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge & Understanding	a1	1	1	1	1		1	1		1		1	1	
	a2	1			1					1		1	1	1
	a3	1			1					1		1	1	1
	a4	1	1	1	1	1	1	1		1		1	1	1
	a5	1					1			1	1	1	1	1
	a6	1						1					1	1

	a7	1		1	1	1		1	1				1	
Intellectual Skills	b1	1			1					1		1		1
	b2	1			1	1				1		1	1	1
	b3	1	1	1	1		1	1		1	1		1	
	b4	1	1		1		1	1		1	1	1	1	1
Applied Professional Skills	c1	1	1		1	1	1			1	1	1	1	1
	c2	1			1					1		1	1	1
	c3	1		1		1		1	1				1	1
	c4	1			1	1					1		1	1
	c5						1				1			
	c6						1				1			
General Tran. Skills	d1			1		1		1					1	
	d2		1	1				1	1				1	
	d3	1	1					1					1	1
	d4	1	1	1				1						
	d5							1	1				1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	15
Mid-Term Exam	6-th Week	15
Practical Exam	Fifteenth week	20
Written Exam	Sixteenth week	100
Total		150

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 & Technology
Manufacturing Engineering and Production Technology Department

M580a: Modeling & Simulation (Elective II)
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Modeling & Simulation (Elective II)   **Code:** M580a   **Year/level:** 5-th year / 2-nd Term
Teaching Hours: **Lectures:** 2   **Tutorial:** 2
                        Practical: --   **Total:** 4

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.(A8, A15, A17)
  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 from 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
• Continuous and Discrete system simulation	2	-	
• Development of simulation models	6	6	
• Random number generation	4	4	
• Model Validation, and analysis of model output	4	4	
• Impact of nonlinearity and transient behavior	4	4	
• Dynamic system analysis	4	4	
• Application of simulation packages.	4	6	
• Revision	2	2	
Total hours	**30**	**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	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1	1		1					1	1		1	1	1	1	
	a2	1	1				1				1		1	1	1	1	
	a3	1	1				1				1		1	1	1	1	
Intellectual	b1	1	1		1		1				1		1	1	1	1	
	b2	1	1		1		1				1		1	1	1	1	
	b3	1	1				1				1		1	1	1	1	
	b4	1	1		1		1				1		1	1	1	1	
Applied	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	
General	d1								1								
	d2								1								
	d3								1								
	d4								1								

5- Assessment Timing and Grading:

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

6- List of References
6-1 Course notes
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: Prof. Dr. Bakr M. Rabeeh
Head of the Department: Dr, Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M580c: Production Planning & Control (Elective I)
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Production Planning & Control(Elective I) | **Code:** 580c | **Year/level:** 5-th year / 1-st Term
Teaching Hours: | **Lectures: 2** | **Tutorial: 2**
 | **Practical: -** | **Total: 4**

C - Professional Information

1 – Course Learning Objectives

One side of the objective of this course is to introduce basic activities of planning production enterprises that includes; functions within business organizations and management processes, productivity, competitiveness, and strategy, forecasting techniques, seasonality, accuracy, and forecast control, aggregate planning, materials requirement plan (MRP), manufacture scheduling, assignment techniques, work system design, site location, and facilities selection and layout. The other side of course objective is to introduce basis of controlling activities of quality and inventory.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
  a1- Functions within business organizations and management processes,
  a2- Productivity, competitiveness, and strategy,
  a3- Forecasting techniques, seasonality, accuracy, and forecast control,
  a4- Aggregate planning, and materials requirement plan (MRP),
  a5- Assignment and manufacture scheduling techniques,
  a7- Choice of site location and facilities selection and layout techniques.
  a8- Quality definitions and control techniques,
  a9- Inventory management principles and control models.

B - Intellectual skills
By the end of the course the student should be able to:
  b1- Evaluate Productivity and competitiveness of business organizations,
  b2- Evaluate forecast accuracy, seasonality, and control techniques,
  b3- Evaluate plans and choose the appropriate one,
  b4- Evaluate site locations and make decision concerning the appropriate selection of best location,
  b5- Make decisions concerning appropriate plans and proper system designs
  b6- Evaluate facility alternatives and make decisions concerning the selection of the proper facility,
  b7- Evaluate inventory models and inventory management.

C - Professional and practical skills
By the end of the course the student should be able to:
  c1- Solve the problems related to forecasting, seasonality, accuracy, and forecast control,
  c2- Formulate Aggregate materials requirement plans), and choose the best aggregate plan,
  c3- Solve the assignment problem, and

c4- Formulate Schedules for manufacture

c5- Design work system,

c6- Solve the problem of determining the best site location problem

c7- Design facilities layout.

c8- Design quality control charts.

c9- Solving inventory control models.

D - General and transferable skills

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

d1- Lead and motivate working groups.

d2- Work within multi-disciplinary team.

d3- Present finding of in written and oral forms.

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A3, A5, A6, A7, A9, A13, A14, A20, A21, A22
B	Intellectual skills	B2, B3, B4, B5, B7, B9, B10, B11, B15, B16
C	Professional and practical skills	C1, C2, C3, C7, C10. 13, C19
D	General and transferable skills	D1, D5, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Functions within business organizations, management processes, productivity, competitiveness, and strategy	2	2	
Forecasting techniques, seasonality, accuracy, and control	4	4	
Aggregate planning, and materials requirement plan (MRP),	4	4	
Assignment and manufacture scheduling techniques,	4	4	
Work systems design,	4	4	
Choice of site location, facilities selection and layout techniques.	4	4	
Quality definitions and control techniques,	4	4	
Inventory management principles and controlling models,	4	4	
Total hours	**30**	**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	Projects	Researches	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	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	b1	1	1		1	1				1			1		1		1
	b2	1	1		1	1				1			1		1		1
	b3	1	1		1	1				1			1		1		1
	b4	1	1		1	1				1			1		1		1
Applied	c1	1	1		1					1			1				1
	c2	1	1		1					1			1				1
	c3	1	1		1					1			1				1
	c4	1	1		1					1			1				1

	d1			1			1							1		1	
	d2			1			1							1		1	
General Tran.	d3			1			1							1		1	
	d4			1			1							1		1	
	d5			1			1							1		1	
	d6			1			1							1		1	
	d7			1			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	6th Week	
Practical Exam	13th Week	
Written Exam	Sixteenth week	35
Total		Total

6- List of References

6-1 Course notes:
Lecture notes, Production planning & Control, by Merdan, Ph. D., 2010

6-2 Essential books
(text books),None

6-3 Recommended books;
Operations management, 5th Edition, by William J. Stevenson, McGraw-Hill and Irwin, 2005

6-4 Periodicals, Web sites, etc.
None

6-6 Technological Tables

7- Facilities Required for Teaching and Learning
Students are required to use own PCs, Educational Software is given

Course Coordinator: Dr. M. Merdan
Head of the Department: Dr, Abdelmagid A. Abdalla
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M581: Advanced Manufacturing Processes
Course Specifications

A- Affiliation

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

B - Basic Information

Title: Advanced Manufacturing Process **Code:** M581 **Year/level:** 5-th year / 2-nd Term

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

C - Professional Information

1 – Course Learning Objectives

The main objective of this course is to provide the students with knowledge about the advanced methods used for manufacturing complex shapes and very hard materials which are used today.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- The main classification of non-traditional manufacturing methods., A8
a2- The concept and theories of thermal, chemical, and mechanical methods, A11
a3- The constrains within which the selection of suitable method is judged, A13, A14
a4- The main applications of each process, A15

B - Intellectual skills
By the end of the course the student should be able to:
b1- Analyze the performance and accuracy of advanced manufacturing. methods., B9,
b2- Select suitable method for production of specified product , B10.
b3- Consider the applicability, economy of different method., B14, B15
b4- Reach engineering judgment considering a balanced costs, benefits safety, quality, reliability and environmental impact for different processes., B18

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Operate and maintain selected EDM, LBM, AWJ machines, C10.
c2- Prepare and present technical reports., C10, C17
c3- Select suitable operating parameters for manufacturing of different materials, with required quality., C17

D - General and transferable skills
By the end of the course the student should be able to:
d1- Communicate with others, and work in team., D3
d2- Search for information in references and internet., D7
d3- Refer to relevant literature effectively., D9

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Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A8, A11, A13, A14, A15
B	Intellectual skills	B9, B10, B14, B15, B18
C	Professional and practical skills	C10, C17
D	General and transferable skills	D3, D7,, D9

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction to Non-Traditional Machining	3	2	-
• Electro-Discharge Machining (EDM)	9	4	12
• Electro Chemical Machining (ECM)	6	2	4
• Laser beam Machining (LBM)	6	2	4
• Electron beam Machining (EBM)	2		2
• Ultrasonic Machining (USM)	3		-
• Abrasive jet Machining (AJM)	2	2	2
• Water jet Machining (WJM)	3		4
• Abrasive water jet Machining (AWJM)	3		-
• Chemical Machining (CHM)	3		-
• Plasma Arc Machining (PAM)	2	1	2
• Hybrid Non-Traditional methods	3	2	-
Total hours	**45**	**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	Projects	Researches and	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1			1	1							1		1		1
	a2	1			1	1							1		1		1
	a3	1			1	1							1		1		1
	a4	1			1	1							1		1		1
	A5	1			1	1							1		1		1
Intellectual	b1	1			1	1							1		1		1
	b2	1			1	1							1		1		1
	b3	1			1	1							1		1		1
	b4	1			1	1							1		1		1
Applied	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.	d1				1	1									1		1
	d2				1	1									1		1
	d3				1	1									1		1
	d4				1	1									1		1
	d5				1	1									1		1
	d6				1	1									1		1
	d7				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	6th Week	10
Practical Exam	13th Week	20
Written Exam	Sixteenth week	100
Total		150

6- List of References

6-1 Course notes
None.

6-2 Required books
A.M.KOHAIL, Selected topics in Advanced Manufacturing Technology, Cairo, 2008

6-3 Recommended books
H.EL-HOFY, Advanced Machining processes, McGraw HILL, 2005

6-4 Periodicals, Web sites, etc.
None.

7- Facilities Required for Teaching and Learning

- Computer data show.
- Education movies.
- Non-traditional manufacturing lab

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

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M598: Report
Course Specifications

A- Affiliation

Relevant program: Manufacturing Engineering & 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: Technical Report Writing   **Code:** M598   **Year/level:** 5-th year / 1-st Term
Teaching Hours: **Lectures: --**   **Tutorial: 2**
                        Practical: --   **Total: 4**

C - Professional Information

1 – Course Learning Objectives

The main objective of this course is to introduce the basic concepts of writing technical reports, research papers, resume, and business letters.

2 - Intended Learning Outcomes (ILOS)

A - Knowledge and understanding
By the end of the course the student should gain the following knowledge:
a1- Different theoretical models of writing. (A10)
a2- The art of communicating information.(A11)
a3- Implement information and communication technology in his future job. (A11)

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- Learn methods of analyzing the engineering data.(B11)
b5- Know the correct expressions and analytical reading. (B4)
b6- Master the art of writing report of projects and experiments.(B8)

C - Professional and practical skills
By the end of the course the student should be able to:
c1- Gain practice using technical writing tools. (C12)
c2- Interact professionally with other writers and their writing. (C11)
c3- Learn how to communicate effectively his knowledge and scientific findings with other people. (C11)

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- Learn effective collaborative group work and publishing strategies. (D6, D8)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A10, A11
B	Intellectual skills	B4, B8, B11
C	Professional and practical skills	C11,C12
D	General and transferable skills	D6, D8

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
• Introduction: Paper Presentation	2		
• Steps to a Successful Writing Assignment	2		
• The Writing Process	2		
• Mechanics	4		
• Research Papers and Reports	2		
• Technical Report Writing	4		
• Resumes and Cover Letters	2		
• Using Words Correctly	2		
• Report and Thesis Layout	2		
• Technical Writing Ethics	4		
• A Structured Approach to Presenting Postgraduate Research Theses	4		
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	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	Written Exam	Practical Exam	Quizzes	Term papers	Assignments
Knowledge	a1	1		1							1		1				1
	a2	1									1		1			1	
	a3	1											1				1
Intellectual	b1	1							1								
	b2	1							1								
	b3	1							1				1			1	
	b4	1							1				1				
	b5	1							1				1				
	b6	1							1				1				
Applied	c1	1											1			1	
	c2	1											1			1	
	c3	1											1			1	
General	d1	1														1	
	d2	1	1								1					1	
	d3	1	1													1	

5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	15
Mid-Term Exam	6-th Week	--
Practical Exam	-	-
Written Exam	Sixteenth week	35
Total		50

6- List of References

6-1 Course notes

Lecture notes and handouts

6-2 Essential books (text books)

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

6-3 Recommended books

- Anderson, Paul. "Technical Communication: A Reader-Centered Approach", 5th edition (2003).
- Deborah, C.A. & Margaret D. Blickle, "Technical Writing, Principles and Forms", 2nd. Ed. , MacMillan Publishing, 2nd edition, 1982.
- Douglas Godfrey, "ASLE Author's Guide", Jan. ,1977, and

[١]   أحمد شلبى ، " كيف تكتب بحثاً أو رسالة " ، مكتبة النهضة المصرية ، شارع عدلى ، القاهرة ، ١٩٦٨.

[٢]   محمد عبد الغنى سعودى و محسن أحمد الخضيرى ، " الأسس العلمية لكتابة رسائل الماجستير و الدكتوراه " ، مكتبة الأنجلو المصرية – القاهرة ، ١٩٨٦.

[٣]   محمد الصاوى محمد مبارك ، " البحث العلمى ـ أسسه و طرق كتابته " ، المكتبة الأكاديمية ، القاهرة ، ١٩٩٢.

[٤]   نبيل جادالله ، " محاضرات فى التحليل التجريبى – للدراسات العليا " ، ١٩٩٦.

[٥]   نبيل جادالله ، "البحوث وكتابة التقارير" ، القاهرة ، ٢٠٠١/٢٠٠٢.

6-4 Periodicals, Web sites, etc.

www.technical-writing.com.
www.monash.edu.au/lls/llonline/writing/engineering/technical-report/index.xml
http://writing.colostate.edu/guides/pdfs/guide88.pdf
http://scisweb.ulster.ac.uk/~projects/guide-to-technical-writing-1.pdf

7- Facilities Required for Teaching and Learning

Students are required to use own PCs, Educational Software is given

Course Coordinator: Dr. Elsayed Kamar.
Head of the Department: Dr. Abdelmagid Abdelatif
Date: September 2015

Modern Academy for Engineering & Technology
Manufacturing Engineering and Production Technology Department

M599: Project II
Course Specifications

A- Affiliation

Relevant program:	Manufacturing Engineering & 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: Project II **Code:** M599 **Year/level:** 5-th year / 2-nd Term
Teaching Hours: **Lectures:** -- **Tutorial:** --
 Practical: 4 **Total:** 4

C - Professional Information

1 – Course Learning Objectives
A study of this course will enable the student to:
- Apply the theoretical and practical background in Design and Manufacturing fields
- Choice of material and technology & production for solution & technical problems in the field of design & manufacture.

2 - Intended Learning Outcomes (ILOS)

A- Knowledge and Understanding:
By the end of the project the student demonstrate knowledge and understanding of:
- a1- Realization and application of different concepts, principles and theories relevant to mechanical engineering, manufacturing and production technology . (A1, A13)
- a2- Actual constraints within which his/her engineering judgment will have to be exercised. (A14)
- a3- The specifications of machine parts and mechanical systems and application of CAD and CAD/CAM facilities. (A3, A15)
- a4- Contemporary issues and advancements in mechanical engineering and production technologies.(A8, A12, A16, A21)
- a5- Importance of basic electrical, control and computer engineering subjects related to production (A17)
- a6- Preparation of reports and presentations concerning project.(A10, A18)
- a7- Engineering design principles and techniques (A19)
- a8- Role of planning tasks and managing of time and resources. (A20)

B- Intellectual Skills
By the end of the project the student should be able to:
- b1- Use the principles of mathematics, science and technology to perform the assigned project. (B13)
- b2- Compare between technological processes to carry out the project. (B4, B14)
- b3- Use the principles of engineering science in developing solutions to practical problems of the project. (B16)
- b4- Select the proper manufacturing method to execute the project components. (B18)

C- Practical & Professional Skills
By the end of the project the student should be able to:
- c1- Communicate all the documents of the project as engineering drawings, computer graphics and specialized technical reports. (C7, C9, C13)
- c2- Employ the traditional and modern CAD and CAD/CAM facilities in design and production processes of parts. (C14)
- c3- Use basic workshop equipment safely in manufacturing processes. (C17, C15, C6)
- c4- Analyze experimental results and calibration processes and determine their accuracy and validity. (C16)

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D- General and Transferable Skills

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

   d1- Show the team work and effective communication of documents between the individuals. (D1, D3, D4, D5)

   d2- Manage tasks, time, and resources considering the constraints effectively.(D6, D2)

Course Contribution in the Program ILO's

ILO's		Program ILO's
A	Knowledge and understanding	A1, A3, A8, A10, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21
B	Intellectual skills	B4, B13, B14, B16, B18
C	Professional and practical skills	C6, C7, C9, C13, C14, C15, C16, C17
D	General and transferable skills	D1, D2, D3, D4, D5, D6

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Collection & technical data			
Collection & theoretical background			
Design and Technological procedures			
Problem solving			
Realization & design			
Testing and inspection			
Design & experiment			
Writing technical report			
Follow up & technical work			
Assembly & components			
Presenting the product data			
Evaluation & product efficiency			
Total hours			**60**

4 - Teaching and Learning and Assessment methods:

Course ILO's		Lecture	Presentations & Movies	Discussions &seminars	Tutorials	Problem solving	Laboratory & Experiments	Projects	Researches and Reports	Modeling and Simulation	Site Visits	Discovering	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		1	
	a3	1		1		1	1	1		1				1		1	
	a4	1		1		1	1	1		1				1		1	
	a5	1		1		1	1	1		1				1		1	
	a6	1		1		1	1	1		1				1		1	
	a7	1		1		1	1	1		1				1		1	
	a8	1		1		1	1	1		1				1		1	
Intellectual	b1	1			1		1	1	1					1		1	
	b2	1			1		1	1	1					1		1	
	b3	1			1		1	1	1					1		1	
	b4	1			1		1	1	1					1		1	
Applied	c1						1	1						1			
	c2						1	1						1			
	c3						1	1						1			
	c4						1	1						1			
Gener	d1		1	1				1									
	d2		1	1				1									

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5- Assessment Timing and Grading:

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and reports	Bi-Weekly	50
Report Preparation	1 Week before defence	50
Defence & presentation	3-4 Weeks after final exams	100
Total		200

6- List of References

Depends of the field of the project

7- Facilities Required for Teaching and Learning

All available facilities

Course Coordinator: Dr, Abdelmagid A. Abdalla
Head of the Department: Dr, Abdelmagid A. Abdalla
Date: September 2015

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Appendix 3

قواعد حساب التقدير والتيسير للجان رصد الدرجات

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قواعد حساب التقدير والتيسير للجان رصد الدرجات

تنفيذا للقرار الوزارى رقم ٩٧٠ بتاريخ ٢٠٠٥/٤/١٠ بشــأن قواعد التيسـير لطلاب المعاهد الخاصــة الخاضـعة لوزارة التعليم العالى وقرار لجنة قطاع المعاهد الصناعية والهندسية بجلسـتها يوم الخميس الموافق ٢٠٠٩/٠١/٢٩ والتي اعتمدت من السيد الأستاذ الدكتور الوزير بتاريخ ٢٠٠٩/٠٢/٠٦ وقرار لجنة قطاع المعاهد الهندسية والصناعية فى اجتماعها يوم الثلاثاء الموافق ٢٠٠٩/٣/٣ والذى تم اعتماده من السيد الأستاذ الدكتور الوزير بتاريخ ٢٠٠٩/٣/١٦، يتم منح درجات التيسير كما يلى.

أولا: نص القرار

مادة (١): يخصص للطالب درجات تعادل ٢% من مجموع النهايات العظمى لمجموع المواد التى تدرس فى العام الدراسى ويتم تطبيق قواعد التيسير فى امتحان نهاية العام (مايو) ويستفيد الطالب من هذه الدرجات لتغيير حالته من راسب إلى ناجح فى أى عدد من المواد أو لرفع تقديره فى المجموع الكلى أو للتخفيف فى مواد الرسوب. وتستخدم هذه الدرجات فى الحدود التالية:
أ- أن لا يجاوز ما يمنح للطالب فى المادة الواحدة عن ٥% من النهاية العظمى للمادة الواحدة وفى أى عدد من المواد، ويجبر كسر الدرجة لصالح الطالب.
ب- فى حالة تغيير حالته من راسب إلى ناجح أو منقول بمادة أو مادتين أو تخفيف عدد مواد الرسوب.

مادة (٢): يمكن أن يستفيد الطالب من هذا المجموع فى أى عدد من مواد الرسوب وفقا للحدود المبينة بعالية، وفقا لصالح الطالب ووفقا للأولويات التالية:
مواد التخلف
المواد الأقرب للنجاح
المواد المساعدة

مادة (٣): يمنح الطالب المعرض للقيد من الخارج أو الفصل لاستنفاذ مرات الرسوب ٣% من المجموع الكلى للنهايات العظمى للمواد إذا أدى ذلك لتغيير حالته وبما لا يزيد فى المادة عن ١٠% من الدرجة النهائية للمادة ويمكن إن يحصل الطالب على هذه الدرجات فى أى عدد من المواد.

مادة (٤): الطالب الراسب فى مادتين وإحداهما داخل قواعد التيسير يمكن أن يستفيد الطالب من هذه القواعد ويعتبر متخلفا فى مادة واحدة بدلا من مادتين.

مادة (٥): يضاف ١% من المجموع الكلى الذى حصل عليه الطالب إذا أدى ذلك إلى رفع التقدير العام للطالب بالفرقة وذلك فى حدود المتبقى من درجات التيسير.

مادة (٦): يحسب للطالب الذى ينجح فى مادة التخلف أعلى درجة من تقدير مقبول ما لم يكن قد حصل على أقل من ذلك.

مادة (٧): يطبق المجموع التراكمى على الطلاب الذين كانوا مقيدين بالفرقة الأولى فى العام ١٩٩٦/٩٥ بالمعاهد العالية وعام ٩٨/٩٧ بالنسبة للمعاهد المتوسطة.

مادة (٨): تطبق قواعد التيسير فى نهاية العام الدراسى وتعلن نتيجة الفصل الدراسى الأول فى المعاهد التى تطبق نظام الفصلين بالتقدير بدون تطبيق قواعد التيسير.

مادة (٩): لا تطبق قواعد التيسير السابقة على المواد العملية والتى لا يدخل فى امتحانها جزء تحريرى مثل المشروع أوالتدريب الميدانى وكذا المواد التى لا تدخل درجاتها ضمن المجموع الكلى للمواد.

مادة (١٠): يعتبر دور نوفمبر بالنسبة للسنوات النهائية دورا مستقلا ويطبق عليه القواعد السابقة وإذا كان الطالب ناجحاً في أعمال السنة تؤخذ الدرجات الحاصل عليها الطالب دون تعديل. أما إذا كان الطالب راسباً في أعمال السنة فيؤخذ بدرجة التحريري إذا كان الطالب ناجحاً في التحريري مع تنسيب الدرجة لتشمل أعمال السنة.

مادة (١١): على جميع الجهات المختصة تنفيذ هذا القرار

ثانيا: التعليمات التفصيلية لمنح درجات التيسير

لجان رصد الدرجات تلتزم برصد الدرجات المسلمة اليها بكشوف الرصد من واقع

- درجة التحريرى المسجلة على ورقة الامتحان
- درجة أعمال السنة والامتحان العملى أو الشفهى المسجلة بالكشوف المقدمة من أستاذ المادة وموقع على جميع صفحاتها منه مع التأكد من التوقيع قرين أى كشط أو تعديل فى الدرجة
- قرارات التأديب ولجان الممتحنين وأى قرارات أخرى لمجلس تعليم الأكاديمية إن وجدت.

أولا: تطبق القواعد التالية على الطلبة الجدد والباقون للإعادة ودور نوفمبر:

1- الحد الأقصى لدرجات التيسير:

السنة الأولى	٣٠ درجة
السنة الثانية	٣٠ درجة
السنة الثالثة عدا العمارة	٢٨ درجة
السنة الثالثة عمارة	٣٠ درجة
السنة الرابعة عدا العمارة والتصنيع	٢٩ درجة
السنة الرابعة عمارة وتصنيع	٣٠ درجة
السنة الخامسة عدا العمارة	٢٦ درجة
السنة الخامسة عمارة	٢٤ درجة
دور نوفمبر عدا العمارة	٢٦ درجة
دور نوفمبر العمارة	٢٤ درجة

2- الحد الأقصى لدرجة التيسير التى تمنح للمادة:

الدرجة القصوى للمادة	٥٠	٧٥	١٠٠	١٥٠	٢٠٠	٢٥٠
الحد الأدنى للدرجة للسماح بالتيسير	٢٢٫٥	٣٣٫٧٥	٤٥	٦٧٫٥	٩٠	١١٢٫٥
الحد الأقصى لدرجة التيسير التى تمنح	٣	٤	٥	٨	١٠	١٣

٣- أولوية المواد الخاضعة للتيسير:

أولوية أولى: مواد التخلف التى تحتاج لدرجات أقل للنجاح فالأعلى
أولوية ثانية: المواد الأساسية الأقرب للنجاح (التى تحتاج لأقل درجات للنجاح فالأعلى)
أولوية ثالثة: المواد الانسانية التى تحتاج لدرجات أقل للنجاح فالأعلى

٤- الحد الأقصى لدرجات التيسير لرفع التقدير الكلى للسنة وذلك فى حدود المتبقى من درجات التيسير ولا يسرى هذا التيسير على المجموع التراكمى:

السنة الأولى	١٥ درجة
السنة الثانية	١٥ درجة
السنة الثالثة عدا العمارة	١٤ درجة
السنة الثالثة عمارة	١٥ درجة
السنة الرابعة عدا التصنيع	١٥ درجة
السنة الرابعة تصنيع	١٤ درجة
السنة الخامسة عدا العمارة	١٣ درجة
السنة الخامسة عمارة	١٢ درجة
دور نوفمبر عدا العمارة	١٣ درجة
دور نوفمبر عمارة	١٢ درجة

ثانيا: تطبق القواعد التالية على الطالب المتقدم من الخارج و المعرض للقيد من الخارج أو الفصل لاستنفاذ مرات الرسوب:

١- الحد الأقصى لدرجات التيسير:

السنة الأولى	٤٥ درجة
السنة الثانية	٤٥ درجة
السنة الثالثة عدا العمارة	٤٢ درجة
السنة الثالثة عمارة	٤٥ درجة
السنة الرابعة عدا العمارة والتصنيع	٤٤ درجة
السنة الرابعة عمارة	٤٥ درجة
السنة الرابعة تصنيع	٤٢ درجة
السنة الخامسة عدا العمارة	٣٩ درجة
السنة الخامسة عمارة	٣٦ درجة
دور نوفمبر عدا العمارة	٣٩ درجة
دور نوفمبر العمارة	٣٦ درجة

٢- الحد الأقصى لدرجة التيسير التى تمنح للمادة:

الدرجة القصوى	٥٠	٧٥	١٠٠	١٥٠	٢٠٠	٢٥٠
الحد الأدنى للدرجة للسماح بالتيسير	٢٠	٣٠	٤٠	٦٠	٨٠	١٠٠
الحد الأقصى لدرجة التيسير التى تمنح	٥	٨	١٠	١٥	٢٠	٢٥

ثالثا: أقصى درجة تسجل لمواد التخلف:

الدرجة القصوى لمادة التخلف	٥٠	٧٥	١٠٠	١٥٠	٢٠٠	٢٥٠
الحد الأقصى لدرجة النجاح التى تسجل (وتسجل الدرجة الفعلية إذا كانت أقل)	٣٢	٤٨	٦٤	٩٦	١٢٨	١٦٠

رابعا: حالة الغياب بعذر

الطالب المحمل بمادة تخلف (غياب بعذر) بقرار مجلس الأكاديمية وموافقة الوزارة يمنح درجته كاملة مالم يكن قد سبق له الرسوب فى هذه المادة.

خامسا: التقدم للامتحان من الخارج

حالات التقدم من الخارج ينظمها القرار الوزارى رقم ٤٧٩ بتاريخ ١٩٩٤/٤/١٧ بشأن تعديل بعض أحكام لائحة المعاهد العليا التابعة والخاضعة لوزارة التعليم العالى.

			موقف الطالب				السنة الدراسية بالأكاديمية
	متقدم من الخارج للمرة اثالثة	متقدم من الخارج للمرة الثانية	متقدم من الخارج للمرة الأولى	باق للإعادة	مستجد		
	يفصل نهائى لاستنفاذ مرات الرسوب						**الأولى**
	يفصل نهائى		من الخارج				**الثانية**
يفصل نهائى							**الثالثة**
							الرابعة
يفصل نهائى إذا رسب فى اكثر من نصف المواد وفى حالة النجاح فى نصف المقررات يرخص له بالامتحان حتى يتم نجاحه	من الخارج			دراسة منتظمة	دراسة منتظمة	دراسة منتظمة	**الخامسة**

سادسا: تقديرات المواد والسنوات والتخرج

١- يحتسب تقدير المادة على أساس النسبة المئوية التى حصل عليها الطالب فى المادة وطبقا للجدول أدناه.

٢- يحتسب تقدير النجاح فى العام الدراسى للطالب فى حالة النجاح بدون مواد تخلف من العام الحالى أو سنوات سابقة. يحتسب التقدير على أساس النسبة المئوية لمجموع الدرجات التى حصل عليها الطالب فى مواد نفس العام. ولا يدخل فى حساب التقدير أى مواد تخلف وطبقا للجدول أدناه.

٣- فى حالة النجاح فى مواد التخلف فإنها تدخل فى حساب تقدير عامها الأصلى.

٤- يحتسب تقدير التخرج على أساس النسبة المئوية للمجموع التراكمى للخمس سنوات وطبقا للجدول أدناه.

الدرجة	أقل من ٣٠%	من ٣٠% إلى أقل من ٥٠%	من ٥٠% إلى أقل من ٦٥%	من ٦٥% إلى أقل من ٧٥%	من ٧٥% إلى أقل من ٨٥%	٨٥%فأكثر
التقدير	ض ج ضعيف جدا	ض ضعيف	ل مقبول	ج جيد	ج ج جيد جدا	م امتياز

سابعا: مرتبة الشرف

يحصل الطالب على مرتبة الشرف عند التخرج إذا حقق الشروط الآتية:

١- أن يحصل على تقدير امتياز أو جيد جدا فى المجموع التراكمى للخمس سنوات

٢- ألا يقل تقديره فى أى عام من أعوام الدراسة عن جيد جدا عدا السنة الأولى.

ثامنا: كيفية احتساب أعمال السنة لطالب السنة النهائية فى امتحان الدور الثانى (دور نوفمبر)

١- إذا كان الطالب ناجحا فى أعمال السنة تؤخذ درجات أعمال السنة الحاصل عليها الطالب دون تعديل من دور مايو.

٢- إذا كان الطالب راسبا فى أعمال السنة فيؤخذ بدرجة التحريرى مع تنسيب الدرجة الحاصل عليها الطالب لتشمل أعمال السنة.

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