MinoufiyaUniversity,
Faculty of Engineering,
Prod. Eng.& Mech. Design Dept.

COURSE SPECIFICATION

Course Title:	Nondestructive Tests
Course Code:	PRE 601
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	2013

COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	Credit hours	3cr-hrs	
2	Exam. Hours	3 hrs	
3	Contact Hours	Lecture: 3 hrs/week	Lab: - hrs/week
3	Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs.)	Production Engineering and Mechanical Design	
4	Level at which this course is offered.	M. Sc.	
5	Pre-requisites course.	None	
6	Pre-requisites by Topic	None	
7	Coordinator	Dr. Adel AbdelazizMostafa Dr. Badr Mohamed Badr Abdelbary	
8	External Evaluator(s)	Prof. Dr.	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Different methods to detect industrial process defects as ultrasonic, penetrant, magneticparticles, eddy current, Radiographic Testing, Acoustic Emissions , Laser Testing Methods and Vibration Analysis Method also detect defects in products produced by different manufacturing processes.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. ***Course Objectives:***

The objective of this course is to understand the basic principles of various NDT methods, fundamentals, discontinuities in different product forms, importance of NDT, applications, limitations of NDT methods and techniques and codes, standards , specifications related to non-destructive testing technology and practical skills in using different tests appropriately in field of finding industrial defects..

B.3. Relationship between the course and the programme

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A6,A13, A20	B2, B6, B16	C5,C16	D1, D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A-1) Concepts and theories of mathematics and sciences, appropriate to the discipline.	a-1-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.
	A-6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	a-6-1) Define the quality basics for nondestructive test methods. a-6-2) Identify the application field of each method.
	A-13) Concepts, principles and theories relevant to Mechanical Engineering and manufacture	a-13-1) Relate the suitable NDT with the manufacture method
	A-20) Management and business techniques and practices appropriate to engineering industry.	a-20-1) Discuss different nondestructive tests to diagnose the health of structural and engineering components.
Intellectual skills	B-2) Select appropriate solutions for engineering problems based on analytical thinking.	b-2-1) Create solutions to manufacturing problems through the applications of nondestructive tests
	B-6) Investigate the failure of components, systems, and processes.	b-6-1) Formulate the causes of failureand suggest the method to avoid failure.
		b-6-2)Implement a scientific and organized research for solving production engineering problems and select the most appropriate.
Professional skills	C-5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect,	c-5-1) Employ a suitable techniques to choose a suitable test to check the soundness of any structural or engineering component.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	analyze and interpret results.	
	C-16) Analyze experimental results and determine their accuracy and validity.	c-16-1)Inspect the component with different nondestructive tests to reach conclusions and compare the results with others.
General skills	D-1) Collaborate effectively within multidisciplinary team.	d-1-1)Judge the experimental test by working team. Improve information technology tools related to nondestructive tests
	D-2)Refer to relevant literatures.	d-9-1)Revise different resources to obtain knowledge and information about nondestructive testtechniques.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	NDT General Knowledge	a-1-1, a-6-1, b-2-1, b-6-1, c-5-1
2	Manufacturing processes	a-1-1, a-6-1, b-2-1, b-6-1, c-5-1
3	Types Discontinuities associated with manufacturing processes	a-1-1, a-6-1, b-2-1, b-6-1, c-5-1
4	Basics of Visual Testing - Principles, Techniques, Applications, Limitations, Codes, standards and Specificationsrelated to Visual Testing	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
5	Basics of Liquid Penetrant Testing: Principles, Techniques, Applications, Limitations, Codes, standards and Specifications related to Liquid Penetrant testing	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
6	Basics of Magnetic Particle Testing: Principles, Techniques, Applications, Limitations, Codes, standards and Specifications related to Magnetic Particle testing	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
7	Basics of Ultrasonic Testing: Principles, Techniques, Applications, Limitations, Codes, standards and Specifications related to Ultrasonic Testing	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
8	Basics of Radiographic Testing: Principles, Techniques, Applications, Limitations, Codes, standards and Specifications related to Radiography	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
9	Laser Testing Methods (Laser Theory, Laser Safety, Main Advantages and Disadvantages.	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,
10	Laser Classification – Training	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,
11	Vibration Analysis Method- Principles/Theory, Sources of Vibration, Noise Analysis.	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
12	Vibration Analysis Method- Vibration	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-

Week No.	Contents	ILOs covered by this topic
	Analysis/Troubleshooting, Predictive Maintenance.	2, c-5-1, d-1-1
13	Vibration Analysis Method- Correction Methods, Machine Diagnosis, Sensors,	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
14	Rolling Element Bearing Failures, Blowers,fans and gears	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1
15	Vibration Analysis Method -Laser Methods, Theory of Operation, Applications	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Assignments and Exercises	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Written exam	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1	a-1-1, a-6-1, a-6-2, b-2-1, b-6-1, b-6-2, c-5-1, d-1-1,d-2-1

Weighting of assessments:

Mid-Term Examination	- %
Final-Term Examination	100 %
Oral Examination	- %
Practical Examination	- %
Semester Work	- %
Other Types of Assessment	- %
Total	100 %

B.8. *List of References:*

Essential books (text books):

1- PAUL E. MIX., "INTRODUCTION TONONDESTRUCTIVETESTING - A Training Guide",Copyright © 2005 by John Wiley & Sons, Inc..

Periodicals, Web sites, Course notes, etc:

1- *Nondestructive Evaluation and Quality Control* was published in 1989 as Volume 17 of the 9th Edition *Metals Handbook*. With the second printing (1992), the series title was changed to *ASM Handbook*. The Volume was prepared under the direction of the ASM Handbook Committee.
2- J. of NDT.

B. 9. ***Facilities Required for Teaching and Learning:***

- lecture room with LCD or show

Course coordinator
Dr. Adel Abdelaziz Mostafa
Dr. Badr Mohamed Badr Abdelbary

Head of Dept.

Prof. Dr.Taha Ali El-Taweel

Date: 12 May 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Non-Conventional Forming**
Course Code:	**PRE 602**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**2/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3** cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: - 0** hrs/week
3	**Program(s) in which the course is offered.**	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Al-Badrawy Abo El-Nasr**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Introduction - High energy rate forming processes - explosive forming - Electro hydraulic forming - Electromagnetic forming - Super plastic - Forming - Forging with whish rates (Pneumatic and hydraulic).

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of understanding and analyzing the non-conventional forming techniques. The course will also provide the student with required skills for evaluating the non-conventional forming methods in addition to the skills of identifying the limitations and appropriate conditions for using non-conventional forming techniques.

1. ***B.3. Relationship between the course and the program***

Field	National Academic Reference Standard (NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3, A5	B1, B2, B4, B5	C2, C3, C4	D2

B.4. *Intended Learning Outcomes (ILOs)*

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Understand theory, basics and practices of mathematics, sciences and various the production engineering problems.	a-1-1) Use analytical methods to solve non-conventional forming techniques.
	A-3) Know the scientific developments in the production engineering problems.	a-3-1) Prove the ability to use analytical methods to the non-conventional forming techniques.
	A-5) Know quality basics for working in the production engineering problems.	a-5-1) Prove the ability to examine the quality issues in the non-conventional forming techniques.
Intellectual skills	B-1) Analyze and evaluate the data and use them to solve the production engineering problems.	b-1-1) Able to evaluate validity of the non-conventional forming techniques.
	B-2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2-1) Able to use analytical methods of identifying the working parameters in the non-conventional forming techniques.
	B-4) Implement a scientific and organized research for solving production engineering problems and select the most appropriate.	b-4-1) Able to write report for the most suitable non-conventional forming techniques for specific product.
	B-5) Evaluate the risks in the design of specific production engineering system.	b-5-1) Able to quantify predicted results, and assess specific non-conventional forming techniques.
Professional skills	C-2) Write and evaluate technical reports.	c-2-1 Able to write and present technical reports for non-conventional forming techniques.
	C-3) Evaluate the available methods and tools in the production engineering field.	c-3-1) Able to assess limitations of the non-conventional forming techniques.
	C-4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to specific non-conventional forming techniques.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Introduction to non-conventional forming techniques	a-1-1, c-4-1, d-2-1, d-4-1.
2	High energy rate forming processes	a-1-1, a-3-1, a-5-1, b-1-1, b-2-1, b-4-1, b-5-1, c-4-1
3		
4	Explosive forming	a-1-1, a-3-1, a-5-1, b-1-1, b-2-1, b-4-1, b-5-1, c-3-1, c-4-1
5		
6	Electro hydraulic forming	a-1-1, a-3-1, a-5-1, b-1-1, b-2-1, b-4-1, b-5-1, c-2-1, c-3-1, c-4-1
7		
8	Electromagnetic forming	a-1-1, a-3-1, a-5-1, b-1-1, b-2-1, b-4-1, b-5-1, c-2-1, c-3-1, c-4-1
9		
10	Superplastic - forming	a-1-1, a-3-1, a-5-1, b-1-1, b-2-1, b-4-1, b-5-1, c-2-1, c-3-1, c-4-1
11		
12	Forging with whish rates (Pneumatic and hydraulic).	a-1-1, a-3-1, a-5-1, b-1-1, b-2-1, b-4-1, b-5-1, c-2-1, c-3-1, c-4-1
13		
14	Review	a-1-1, a-3-1, a-5-1, b-1-1, b-2-1, b-4-1, b-5-1, c-3-1, c-4-1, d-2-1, d-4-1
15		

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a-1, a-3, a-5, b-1, b-2, b-4, b-5, c-2, c-3, c-4	a-1, a-3, a-5, b-1, b-2, b-4, b-5, c-2, c-3, c-4

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written Exams	a-1, a-3, a-5, b-1, b-2, b-4, b-5, c-2, c-3, c-4	a-1, a-3, a-5, b-1, b-2, b-4, b-5, c-2, c-3, c-4

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

1. Gary F. Benedict, Nontraditional Manufacturing Processes. Marcel Dekker, New York, NY, CRC Press1987.
2. Other books Recommended by Instructor

13.3- Recommended books

1- Edwards, L. and Endean, M., Manufacturing with materials, 1990, Butterworth Heinemann, ISBN 0-7506-2754-9.

Periodicals, Web sites, Course notes, etc:

1. Journal of Materials Processing Technology.
2. Journal of Materials Processing Technology
3. Manufacturing Technology
4. www.gobookee.org

B. 9. *Facilities Required for Teaching and Learning:*

1. A lecture room with LCD or data show

Course coordinator

Prof. Al-Badrawy Abo El-Nasr

Head of Dept.

Prof. Taha El-Taweel

Date -- 2 November 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Failure Analysis
Course Code:	PRE 603
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	2/11/2013

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: - 0** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Mahmoud Abo-Elkhier**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Introduction - Materials and fracture types - Significance of failure analysis - Causes of failure and steps for failure analysis - Failure fracture - Corrosion failure - Failure due to wrong choice of materials - Failure due to defective manufacturing

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

, **B.2. *Course Objectives:***

The objective of this course is to provide the student with means of analyzing the failure of mechanical components. As well as, this course provide the student with required skills of detecting the critical sections in mechanical components. This course will also provide students with the required skills of identifying types of failure of mechanical components.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3	B2, B5	C3,C4	D2

B.4. *Intended Learning Outcomes (ILOs)*

Field	**Programme ILOs that the course contribute in achieving**	**Course ILOs**
Knowledge & Understanding	A- 1 Understand theory, basics and practices of mathematics, sciences and various production engineering technologies	a-1-1) Use quantitative methods to solve production engineering problems.
	A-3 Know the scientific developments in the production engineering	a-2-1) Prove the ability to use failure techniques to analyze mechanical components.
Intellectual skills	B-2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2-1) Able to use quantitative methods of identifying the failure mode of mechanical components.
	B-5) Evaluate the risks in the design of specific production engineering system.	b-5-1) Able to quantify predicted results, and assess impacts using failure models
Professional skills	C-3) Evaluate the available methods and tools in the production engineering field.	c-3-1) Able to assess limitations of the available numerical methods.
	C-4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to specific production engineering discipline.
	D-4) Use different resources to obtain knowledge and information	d-4-1) Use different resources to obtain knowledge and information

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Engineering properties of materials	a-1-1, a-3-1, b-2-1, c-3-1,c-4-1, d-2-1.
2	Materials characterizations	a-1-1, b-2-1, b-5-1, c-3-1, d-2-1
3	Engineering alloys	a-3-1, b-2-1, b-5-1, c-3-1,c-4-1, d-2-1.
4	Metallurgical aspects	a-1-1, a-2-1, b-2-1, c-3-1,c-4-1, d-2-1.
5	Plastic stress and strain analysis	a-1-1, a-2-1, b-2-1, c-3-1,c-4-1, d-2-1,
6	Plastic stress and strain analysis	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
7	Fatigue analysis procedures	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
8	Fatigue analysis procedures	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
9	Macroscopic failure and failure analysis	a-1-1, b-2-1, b-5-1, c-3-1,c-6-1, d-2-1.
10	Methods of destructive and nondestructive tests	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
11	Methods of destructive and nondestructive tests	a-1-1, a-2-1, b-3-1,c-6-1, d-2-1.
12	Failure analysis procedures	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1, d-2-1, d-4-
13	Failure analysis procedures	a-1-1, a-2-1, b-5-1, c-3-1,c-6-1, d-2-1
14	Case study	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1,c-6-1 d-4-1
15	Case study	a-1-1, a-2-1, b-2-1, b-3-1, c-3-1,c-6-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a-1, a-3, b-2, b-5,, c-3, c-4, d-2, d-4	a-1, a-3, b-2, b-5,, c-3, c-4, d-2, d-4

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a-2, b-2, b-5,, c-3, c-4	a-1, a-3, b-2, b-5,, c-3, c-4

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

" Practical Engineering Fracture Analysis ", H.M. Tawancy, A Al-Hamid and N. M. Abbas, Marcel Dekker , NW, 2004 .

13.3- Recommended books

1- "Failure Analysis: case studies", D.R.H. Jones (ed), Pergamon Press., 2001

Periodicals, Web sites, Course notes, etc:

1. Int. J of Failure Analysis.
2. www.asminternational.org
3. www.gobookee.org

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or data show

Course coordinator

Prof. Mahmoud Abo-Elkhier

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Elasticity and plasticity**
Course Code:	**PRE 604**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**21/3/2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Mahmoud Abo-Elkhier**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Introduction to theory of elasticity, Applications on extrusion torsion by direct integral, Stress and strain functions, Strain rate equation for stress, Strain yielding criteria, Plastic stress-strain relationships, Slip lines, Upper as lower bounding theories, numerical methods.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of analyzing the elasticity problems in engineering applications. As well as, this course provide the student with required skills of analyzing many applications of plastic deformation. This course will also provide students with the required skills of identifying, formulating and solving fundamental engineering problems using numerical methods.

.*B.3. Relationship between the course and the programe*

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A6	B2, B5	C3,C4	D2

B.4. *Intended Learning Outcomes (ILOs)*

Field	**Programme ILOs that the course contribute in achieving**	**Course ILOs**
Knowledge & Understanding	A-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1-1) Recognize quantitative methods to solve production engineering problems.
	A-6) Understand principles and ethics of the scientific research.	a-6-1) Identify elasticity and plasticity bases to analyze production engineering applications.
Intellectual skills	B-2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2-1) Able to plan quantitative methods of analyzing production problems
	B-5) Evaluate the risks in the design of specific production engineering system.	b-5-1) Able to quantify predicted results, and assess impacts using mathematical methods and models
Professional skills	C-3) Evaluate the available methods and tools in the production engineering field.	c-3-1) Able to assess limitations of the available numerical methods.
	C-4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to specific production engineering discipline.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Analysis of stress and strain	a-1-1, a-6-1, b-2-1, c-3-1,c-4-1, d-2-1.
2	Elastic Stress –strain relations	a-1-1, a-6-1, b-2-1, b-5-1, c-3-1, d-2-1
3	Stress and strain function	a-6-1, b-2-1, b-5-1, c-3-1,c-4-1, d-2-1.
4	Solution of elasticity problems in Cartesian coordinates	a-1-1, a-6-1, b-2-1, c-3-1,c-4-1, d-2-1.
5	Solution of elasticity problems in polar coordinates	a-1-1, a-6-1, b-2-1, c-3-1,c-4-1, d-2-1,
6	Strain rate equation of stress	a-1-1, a-6-1, b-2-1, b-5-1, c-4-1, d-2-1.
7	Theory of Plasticity	a-1-1, a-6-1, b-2-1, b-5-1, c-4-1, d-2-1.
8	Plastic stress-strain relations	a-1-1, a-6-1, b-2-1, b-5-1, c-4-1, d-2-1.
9	Application on extrusion	a-1-1, b-2-1, b-5-1, c-3-1,c-4-1, d-2-1.
10	Elastic-plastic analysis	a-1-1, a-6-1, b-2-1, b-5-1, c-3-1, d-2-1.
11	Upper and lower bounding theories	a-1-1, a-2-1, b-3-1,c-6-1, d-2-1.
12	Numerical methods	a-1-1, a-6-1, b-2-1, c-3-1,c-4-1, d-2-1,
13	Numerical methods	a-1-1, a-6-1, b-5-1, c-3-1,c-4-1, d-2-1, d-4-1
14	Numerical methods	a-1-1, a-6-1, b-2-1, b-5-1, c-3-1,c-4-1
15	General revision	a-1-1, a-6-1, b-2-1, b-5-1, c-3-1,c-4-1,

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a-1, a-6, b-2, b-5, c-3, c-4, d-2, d-4	a-1, a-6, b-2, b-5, c-3, c-4, d-2, d-4

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a-6, b-2, b-5, c-3, c-4, d-2, d-4	a-1, a-6, b-2, b-5, c-3, c-4, d-2, d-4

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

" Engineering Solid Mechanics- Fundamentals and Applications", A.R. Ragab and S.E. Bayoumi, CRC Press, 1999 -

13.3- Recommended books

1- W.F. Hosford and R. M. Caddell, " Metal forming" , Printce Hall Inc. , N.J., 1986.

Periodicals, Web sites, Course notes, etc:

1.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or show

Course coordinator

Prof. Mahmoud Abo-Elkier

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2012

Menoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

COURSE SPECIFICATIONS

Course Title:	**Finite Element Method**
Course Code:	**PRE 605**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**20/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: - 0** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**		
6	**Pre-requisites by Topic**		
7	**Coordinator**	**Prof. Dr. Mahmoud Abo-Elkhier**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Concept of finite element method - Application of finite element method of problems under limited conditions- Applications to heat transfer – Fluid mechanics and mechanics of rigid bodies.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	**30%**	**30%**	**20%**	**10%**	**100%**

B.2. ***Course Objectives:***

The objective of this course is to provide the student with means of analyzing numerically the engineering application using the finite element method. As well as, this course provide the student with required skills of determining the critical sections in engineering application. This course will also provide students with the required skills of modeling of engineering application using the finite element method.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3	B2, B5	C1,C3	D

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Understand, discuss, evaluate advanced theories, methods and models, and their implications in production engineering practice	a-1-1) Use quantitative methods to solve production engineering problems.
	A-3 Know the scientific developments in the production engineering	a-2-1) Prove the ability to use e finite element bases to analyze production engineering applications.
Intellectual skills	B-2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2-1) Able to use quantitative methods of analyzing production problems
	B-5) Evaluate the risks in the design of specific production engineering system.	b-5-1) Able to quantify predicted results, and assess impacts using numerical methods and models
Professional skills	C-1) Use efficiently the available tools as computer programs and measuring instruments as well as building ideas in the laboratory or through simulation and apply production engineering techniques.	c-3-1) Employ a suitable software to design problem..
	C-3) Evaluate the available methods and tools in the production engineering field.	c-3-1) Apply numerical modeling to engineering problems.
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Judge the obtained numerical data.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction to finite element method.	a-1-1, a-3-1, b-2-1, c-1-1,c-3-1.
2	Review of the elasticity equations.	a-1-1, a-3-1, b5-1 c-1-1,c-3-1
3	One dimensional element.	a-1-1, a-3-1, b-2-1, b5-1, c-1-1
4	Truss in two-dimensional.	a-1-1, a-3-1, b-2-1, b5-1,c-3-1, d-2-1
5	Truss in three-dimensional	a-1-1, a-3-1, b-2-1, b5-1,c-3-1, d-2-1.
6	Constant strain triangle.	a-1-1, a-3-1, b-2-1, b5-1 c-1-1,c-3-1, d-2-1.
7	Axisymmetric applications.	a-1-1, a-3-1, b-2-1, b-5-1, c-3-1, d-2-1.
8	Isoparametric formulation and numerical integration	a-1-1, a-3-1, b-2-1, b5-1,c-3-1, d-2-1.
9	Analysis of frame	a-1-1, a-3-1, b-2-1, c-1-1,c-3-1, d-2-1
10	Analysis of frame	a-1-1, a-3-1, b-2-1, b5-1 c-1-1,c-3-1, d-2-1.
11	Three-dimensional analysis	a-1-1, a-3-1, b-2-1, c-1-1,c-3-1, d-2-1.
12	Three-dimensional analysis.	a-3-1, b-2-1, b5-1, c-1-1,c-3-1, d-2-1
13	Dynamic consideration	a-1-1, a-3-1, b-2-1, b5-1 c-1-1,c-3-1, d-2-1
14	Applications to heat transfer	a-1-1, a-3-1, b-2-1, b5-1 c-1-1,c-3-1, d-2-1, d4-1.1
15	General revision	a-1-1, a-3-1, b-2-1, b5-1, c-1-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a-1, a-3, b-2, b-5,, c-1, c-3, d-2	a-1, a-2, b-2, b-5,, c-1, c-3, d-2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a-3, b-2, b-5,, c-1 c-3.	a-1, a-3, b-2, b-5,, c-1, c-3.

Weighting of assessments:

Mid-Term Examination	**0 %**
Final-Term Examination	**100 %**
Oral Examination	**0 %**
Practical Examination	**0 %**
Semester Work	**0 %**
Other Types of Assessment	**0 %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

1- "Introduction to Finite Element in Engineering" , I. R. Chandrupatla and A. D. Belegundu, 3rd ed., Prentice Hall,2003.

Recommended books

1- "Finite Element Analysis : Theory and Application", S. Moaveni, Prentice Hall, 2007.
2- "The finite Element Method for Engineers, 4th ed., K.H. Huebner, D.L. Deuhirst and D.E. Smith, John Willy& Sons, 2001

Periodicals, Web sites, Course notes, etc:

1- "Finite Element in Analysis and Design: An International Journal"

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or data show

Course coordinator

Prof. **Mahmoud Abo-Elkhier**

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 Novemeber 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

COURSE SPECIFICATION

Course Title:	**Forming Theory**
Course Code:	**PRE 606**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**20/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification
1	**Credit hours**	3cr-hrs
2	**Exam. Hours**	3 hrs
3	**Contact Hours**	Lecture: 3 hrs/week | Lab: - 0 hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	Production Engineering and Mechanical Design
4	**Level at which this course is offered.**	M. Sc.
5	**Pre-requisites course.**	PRE 604
6	**Pre-requisites by Topic**	Elasticity and Plasticity
7	**Coordinator**	Prof. Dr. Mahmoud Abo-Elkhier
8	**External Evaluator(s)**	Prof.

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Pressing loads and stresses - Friction hills - Stress and strain in rolling –effect of front and back tension - Moment and power in rolling - Extrusion pressures – Wire Drawing - Critical stresses in bending. .

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. and Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. ***Course Objectives:***

The objective of this course is to provide the student with means of analyzing metal forming processes. As well as, this course provide the student with required skills of determining the required force, torque and power for metal forming processes. This course will also provide students with the required skills of identifying the properties of final products.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B2, B5	C3,C6	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Understand, discuss, evaluate advanced theories, methods and models, and their implications in production engineering practice	a-1-1) Use quantitative methods to solve production engineering problems.
	A-2) Has hands on concepts, principles, ethics and tools of elasticity and plasticity	a-2-1) Prove the ability to use elasticity and plasticity bases to analyze production engineering applications.
Intellectual skills	B-2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2-1) Able to use quantitative methods of analyzing production problems
	B-5) Evaluate the risks in the design of specific production engineering system.	b-5-1) Able to quantify predicted results, and assess impacts using mathematical methods and models
Professional skills	C-3) Evaluate the available methods and tools in the production engineering field.	c-3-1) Able to assess limitations of the available numerical methods.
	C-6) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-6-1) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to specific production engineering discipline.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Review of stress and strain	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1, d-2-1.
2	Review of plastic deformation	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-4.
3	Yield criteria and work hardening	a-2-1, b-2-1, b-5-1, c-3-1,c-6-1, d-2-4.
4	Mechanism of forming processes	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1, d-2-1.
5	Study of strain rate and temperature effects	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1, d-2-1,
6	Metal forming machines	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-4.
7	Upper and lower bounding theories	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
8	Slap Method	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-4.
9	Analysis of rolling process	a-1-1, b-2-1, b-5-1, c-3-1,c-6-1, d-2-1.
10	Analysis of extrusion process	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-4.
11	Analysis of extrusion process	a-1-1, a-2-1, b-3-1,c-6-1, d-2-1.
12	Sheet metal forming	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1
13	Analysis of wire drawing	a-1-1, a-2-1, b-5-1, c-3-1,c-6-1, d-2-1.
14	Stresses in bending process	a-1-1, a-2-1, b-2-1, b-5-1, c-6-1
15	General revision	a-1-1, a-2-1, b-2-1, b-3-1, c-3-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a-1, a-2, b-2, b-5,, c-3, c-6, d-2	a-1, a-2, b-2, b-5,, c-3, c-6, d-2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a-2, b-2, b-5,, c-3, c-6.	a-1, a-2, b-2, b-5,, c-3, c-6.

Weighting of assessments:

Mid-Term Examination	**0 %**
Final-Term Examination	**100 %**
Oral Examination	**0 %**
Practical Examination	**0 %**
Semester Work	**0 %**
Other Types of Assessment	**0 %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

1- "Metal Forming : Mechanics and Metallurgy", W.F. Hosford and R.M. Caddell, Cambridge Press, 4th ed. 2007.

Recommended books

1- "Fundamental of metal forming", M. P. Groove, John Willey& Sons, 2002.

Periodicals, Web sites, Course notes, etc:

1. J. of Material Processing Technology
2. J of Applied Plasticity

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or data show

Course coordinator

Prof. **Mahmoud Abo-Elkhier**

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 Novemeber 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Advanced Topics in Machining
Course Code:	PRE 607
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	21/3/2012

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Mahmoud Abo-Elkhier**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Machinability of materials – Evaluation of machinability – New cutting tool materials – Cutting tool failure and durability – Recent failure theories – Economical aspects – Surface integrity.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to equip students to work as technologists/scientists, at an advanced level, in the fields of advanced machining technology. In addition, and more generally:

1-To develop an understanding of the full range of benefits which may be achieved through advanced manufacturing technology and the need to match manufacturing techniques with the product, the company and the market.
2- To provide a broad appreciation of materials, processes and techniques together with themethods used for their evaluation in advanced manufacturing technology and systems.
3- To encourage a flexible systems approach to originating, adapting and developing processes and systems to meet changing technological, management, economic and social criteria.

1. .***B.3. Relationship between the course and the programe***

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1,A5	B4, B6	C2,C3	D2

B.4. *Intended Learning Outcomes (ILOs)*

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	a-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to advanced machining
	a5. Know quality basics for working in the production engineering field.	a5-1) Know quality basics for working in the machining field.
Intellectual skills	b4. Implement a scientific and organized research for solving production engineering problems and select the most appropriate.	b4-1) Implement a scientific and organized research for solving machining problems
	b6. Plan to develop performance of the production engineering systems.	b6-1) Plan to develop performance of the machining engineering systems .
Professional skills	c2. Write and evaluate technical reports.	. C2-1 Write and evaluate technical reports related to advanced machining.
	C-3) Evaluate the available methods and tools in the production engineering field.	c-3-1) Evaluate the available methods and tools in the machining engineering field.
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to specific production engineering discipline.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Intoduction to machining	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1
2	Machinability of materials	C2-1,C3-1, d2-1, a1-1,a5-1, b4-1
3	Evaluation of machinability –	,a1-1,a5-1, b4-1, b6-1
4	Evaluation of machinability	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
5	New cutting tool materials —	,a1-1,a5-1, b4-1, b6-1
6	New cutting tool materials —	C2-1,C3-1, d2-1
7	Cutting tool failure and durability	,a1-1,a5-1, b4-1, b6-1
8	Cutting tool failure and durability	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
9	Cutting tool failure and durability	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
10	Recent failure theories–.	,a1-1,a5-1, b4-1, b6-1
11	Recent failure theories–.	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
12	Recent failure theories–.	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
13	Surface integrity	C2-1,C3-1, d2-1
14	Surface integrity	,a1-1,a5-1, b4-1, b6-1
15	General revision	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

Books Recommended: Text Books:

2. A. Ghosh, and A. K. Mallik, Affiliated East-West Press Pvt. Ltd. New Delhi "Manufacturing Science"

13.3- Recommended books

.

Periodicals, Web sites, Course notes, etc:

1. N. K. Mehta, Machine tool design
2. E. P. DeGarmo, J. T Black, R. A. Kohser, Prentice Hall of India, New Delhi (ISBN 0-02-
3 978760) "Materials and Processes in Manufacturing" (8th Edition), ,
4. G.F. Benedict, Marcel Dekker, Inc. New York (ISBN 0-8247-7352-7) "Nontraditional Manufacturing Processes"
-

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or show

Course coordinator

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Prod. Eng. & Mech. Design Dept

COURSE SPECIFICATION

Course Title:	**Nontraditional machining methods**
Course Code:	**PRE 608**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification
1	**Credit hours**	**3**cr-hrs
2	**Exam. Hours**	**3** hrs
3	**Contact Hours**	**Lecture: 3** hrs/week | **Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**
4	**Level at which this course is offered.**	**M. Sc.**
5	**Pre-requisites course.**	**None**
6	**Pre-requisites by Topic**	**None**
7	**Coordinator**	**Prof. Dr. Mahmoud S. Hewidy**
8	**External Evaluator(s)**	**Prof. Dr.**

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Theory of NTM- Needs of NTM - Classifications - Advantages and limitations - ECM – EDM – LBM – AJM and WJM - Hybrid methods and others.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to build the capacities of the students to:
1. Apply knowledge of mathematics, science and production engineering concepts to the solution of manufacturing problems.
2. Apply the basics and approach scientific research as well as using its different tools in advanced machining processes.

3. Apply perfectly the techniques, skills and up to date tools for nontraditional machining practices.
4. Employ the available sources to realize the highest benefits with continuous performance.
5. Apply the analytical approaches for studying the nontraditional machining problems.

B.3. Relationship between the course and the programme

Field	National Academic Reference Standard (NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A5	B2, B4	C1,C4	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1-1) Explain different non traditional machining processes for solving engineering problems using knowledge of mathematics, science and engineering concepts.
	A-5) Know quality basics for working in the production engineering field.	a-5-1) Define the quality basics for nontraditional methods.
Intellectual skills	B-2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2-1) Create solutions to manufacturing problems through the applications of nontraditional machining techniques.
	B-4) Implement a scientific and organized research for solving production engineering problems and select the most appropriate.	b-4-1) Demonstrate a specific research for solving nontraditional machining problems and select the most appropriate.
Professional skills	C-1) Use efficiently the available tools as computer programs and measuring instruments as well as building ideas in the laboratory or through simulation and apply production engineering techniques.	c-1-1) Use efficiently the available tools as computer programs and measuring instruments and apply nontraditional machining techniques
	C-4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1) Solve the engineering problems to reach conclusions and compare the results with others.
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Improve information technology tools related to nontraditional machining techniques

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Theory of NTM & Needs of NTM	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1
2	Classifications of NTM	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1
3	Advantages and limitations of NTM	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1
4	Electochemical machining (ECM)	a-1-1, a-5-1, b2-1, b-4-1, c-1-1, c-4-1 d-2-1
5	Electric Discharge Machining (EDM)	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
6	Laser Beam Machining (LBM)	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
7	Electron Beam Machining (EBM)	a-1-1, a-5-1 ,b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
8	Plasma Arc Cutting (PAM)	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
9	Abrasive Jet Machining (AJM)	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
10	Water Jet Machining (WJM)	a-1-1, a-5-1, b-2-1,b-4-1, c-1-1, c-4-1 d-2-1
11	Ultrasonic Machining (USM)	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
12	Hybrid methods	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
13	Laser-assisted Electrochemical Machining (ECML)	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1
14	Ultrasonic-assisted Electrochemical Machining (USMEC)	a-1-1, a-5-1, b-2-1, b-4-1,c-1-1, c-4-1 d-2-1
15	Electrochemical Discharge Grinding (ECDG)	a-1-1, a-5-1, b-2-1, b-4-1, c-1-1, c-4-1 d-2-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Assignments and Exercises	a-1, a-5,b-2,b-4,c-1, c-4,d-2	a-1, a-5,b-2,b-4,c-1, c-4,d-2

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Written exam	a-1, a-5,b-2,b-4,c-1, c-4,d-2	a-1, a-5,b-2,b-4,c-1, c-4,d-2

Weighting of assessments:

Mid-Term Examination	- %
Final-Term Examination	100 %
Oral Examination	- %
Practical Examination	- %
Semester Work	- %
Other Types of Assessment	- %
Total	100 %

B.8. *List of References:*

Essential books (text books):

1- McGeough, J. A., "Advanced Methods of Machining", Chapman and Hall, London, 1988.

Periodicals, Web sites, Course notes, etc:

1- Annals of CIRP**.**

2- J. of Material Processing Technology

B. 9. *Facilities Required for Teaching and Learning:*

- lecture room with LCD or show

Course coordinator

Prof. **Mahmoud S. Hewidy**

Head of Dept.

Prof. Dr.Taha Ali El-Taweel

Date-- 5 Feb. 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Numerically Controlled Machine Tools (CNC-I)**
Course Code:	**PRE 609**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**20/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering & Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr.**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Utilization of computer - aided manufacturing in different applications – Languages employed in NC and CNC in machine tools – NC systems and manual part programming – Different methods of computer–assisted part programming – Evaluation costs using computer machinability programming – Role of computer numerically controlled machines in manufacturing automation.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	20%	30%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of utilization of computer-aided manufacturing in different applications and languages employed in NC and CNC in machine tools.

This course also provides the student with means of evaluation costs using computer machinability programming and the role of computer numerically controlled machines in manufacturing automation.

B.3. Relationship between the course and the program

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3, A5& A6	B1, B2 & B6	C1,C2, C3&C4	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	**Programme ILOs that the course contribute in achieving**	**Course ILOs**
Knowledge & Understanding	A1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a1-1) Discuss the theory, basics and practices of mathematics, sciences which related to CNC technology.
	A3) Know the scientific developments in the production engineering.	a3-1) Discuss the scientific developments in the Languages employed in NC and CNC in machine tools.
	A5) Know quality basics for working in the production engineering field.	a5-1) List quality basics for working in the production engineering field dealing with machining.
	A6) Understand principles and ethics of the scientific research.	a6-1) Explain the principles of the scientific research relevant to the field of machining technology.
Intellectual skills	B1) Analyze and evaluate the data and use them to solve the production engineering problems.	b1-1) Analyze and evaluate the data and use them to solve the CNC machining problems.
	B2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b2-1) Create the suitable solutions of problems dealing with manufacturing through the application of specific methods of computer–assisted part programming.
	B6) Plan to develop performance of the production engineering systems.	b6-1) Plan to develop performance of the production engineering by evaluation costs using computer machinability programming
Professional skills	C1) Use efficiently the available tools as computer programs and measuring instruments as well as building ideas in the laboratory or through simulation and apply production engineering techniques.	c1-1) Apply efficiently available tools as computer programs and the suitable techniques for solving the production engineering problems.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C2) Write and evaluate technical reports.	c2-1) Write technical reports about CNC machining.
	C3) Evaluate the available methods and tools in the production engineering field.	c3-1) Evaluate the available methods and tools in the production engineering field.
	C4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c4-1) Use different methods for manufacturing parts and compare the results with others.
General skills	D2) Apply information technology tools related to specific production engineering discipline.	d2-1) Revise the information technology tools related to CNC technology.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Introduction to NC technology	a1-1, a3-1, b5-1, d2-1
2	Utilization of computer – aided manufacturing in different applications	a1-1, a6-1,c2-1, d2-1
3	Languages employed in NC and CNC in machine tools	a1-1, a3-1, c1-1, c3-1,
4	The Components of the CNC system	a1-1, a3-1, b1-1
5	Machine Movements in Numerical Control Systems	a1-1, a5-1, c3-1, c4-1,
6	Control systems of Numerical Control Machine Tools	b1-1, b2-1, b6-1
7	Part Program structure	B2-1, b6-1, c1-1, c3-1,
8	Manual part programming	c1-1, c3-1, c4-1,
9	Miscellaneous functions	a1-1, a3-1, c1-1, c3-1,
10	Sequence block	a3-1, a5-1,c2-1, d2-1
11	Computer-Assisted Part Programming	b2-1, b6-1, c3-1, c4-1,
12	Math in CNC programming	b1-1, b2-1, d2-1
13	CNC and CAD / CAM	c1-1, c4-1, d2-1
14	Evaluation costs using computer machinability programming	b1-1, b6-1, c1-1, c3-1,
15	Role of computer numerically controlled machines in manufacturing automation	b2-1, b6-1, c1-1, c3-1,

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Discussion, Assignments and Exercises, Problem solving, Brain storming, Site visits, Discovering and Self-learning	a1-1, a3-1, a5-1, a6-1, b1-1, b2-1, b6-1, c1-1, c2-1 c3-1, c4-1, d2-1,	A1, A3, A5, A6, B1, B2 ,B6, C1,C2, C3, C4, D2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a3-1, a5-1, a6-1, b1-1, b2-1, b3-1, b4-1, c1-1,c2-1, c3-1, c4-1, d2-1	A1, A3, A5, A6, B1, B2 , B6, C1, C2, C3, C4, D2

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

Michael Fitzpatrick, "Machining and CNC Technology", Career; 2 edition (January 8, 2010)

Recommended books

Smith, Graham T, "CNC Machining Technology, Volume 3: Part Programming Techniques", Springer, 1993.

Periodicals, Web sites, Course notes, etc:

"International Journal of Advanced Machining Processes", Springer

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.):-

1. A lecture room with computer and LCD or data show

Course coordinator

Prof.

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 20 November 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Advanced Manufacturing Methods
Course Code:	PRE 610
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	21/3/2012

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**		
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Introduction- IC Manufactory- IC Packing- CD and DVD manufacturing- Die designs and manufacturing

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to equip students to work as technologists/scientists, at an advanced level, in the fields of advanced machining technology. In addition, and more generally:
1- To engender an understanding of the management role in the investigation, implementation and operation of machining systems for efficiency, cost effectiveness and quality of product.

2- To provide an overview of design, modelling, simulation and prototyping software applicable to manufacturing processes and systems.
3- To encourage a flexible systems approach to originating, adapting and developing processes and systems to meet changing technological, management, economic and social criteria.
.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1,A5	B4, B6	C2,C3	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	a-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to advanced manufacturing
	a-5. Know quality basics for working in the production engineering field.	a5-1) Know quality basics for working in the manufacturing field.
Intellectual skills	b-4. Implement a scientific and organized research for solving production engineering problems and select the most appropriate.	b4-1) Implement a scientific and organized research for solving manufacturing problems
	b-6. Plan to develop performance of the production engineering systems. .	b6-1) Plan to develop performance of the manufacturing engineering systems .
Professional skills	c-2. Write and evaluate technical reports.	. C2-1 Write and evaluate technical reports related to advanced manufacuring .
	C-3) Evaluate the available methods and tools in the production engineering field.	c-3-1) Evaluate the available methods and tools in the manufacturing engineering field.
General skills	D-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to specific production engineering discipline.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction to Advanced Manufacturing Methods	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1
2	IC Manufactory- -	C2-1,C3-1, d2-1, a1-1,a5-1, b4-1
3	IC Packing	,a1-1,a5-1, b4-1, b6-1
4	IC Packing	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
5	IC Packing	,a1-1,a5-1, b4-1, b6-1
6	CD and DVD manufacturing	C2-1,C3-1, d2-1
7	CD and DVD manufacturing	,a1-1,a5-1, b4-1, b6-1
8	CD and DVD manufacturing	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
9	CD and DVD manufacturing	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
10	CD and DVD manufacturing	,a1-1,a5-1, b4-1, b6-1
11	Die designs and manufacturing	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
12	Die designs and manufacturing	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1
13	Die designs and manufacturing	C2-1,C3-1, d2-1
14	Die designs and manufacturing	,a1-1,a5-1, b4-1, b6-1
15	General revision	C2-1,C3-1, d2-1,a1-1,a5-1, b4-1, b6-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1	a1-1,a5-1, b4-1, b6-1, C2-1,C3-1, d2-1

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

"

Books Recommended: Text Books:

1. Juneja, Fundamentals of metal cutting
2. A. Ghosh, and A. K. Mallik, Affiliated East-West Press Pvt. Ltd. New Delhi "Manufacturing Science"

13.3- Recommended books

1. Arshinov, Metal cutting theory & cutting tool design
2. Mikhal Groover, CAD/CAM
3. N. K. Mehta, Machine tool design
4. G.F. Benedict, Marcel Dekker, Inc. New York (ISBN 0-8247-7352-7) "Nontraditional Manufacturing Processes"

Periodicals, Web sites, Course notes, etc:

1.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or show

Course coordinator

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Computer – Aided Manufacturing**
Course Code:	**PRE 611**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**21/3/2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification
1	**Credit hours**	**3**cr-hrs
2	**Exam. Hours**	**3** hrs
3	**Contact Hours**	**Lecture: 3** hrs/week | **Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**
4	**Level at which this course is offered.**	**M. Sc.**
5	**Pre-requisites course.**	**None**
6	**Pre-requisites by Topic**	**None**
7	**Coordinator**	**Prof.**
8	**External Evaluator(s)**	**Prof.**

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Fields and applications – Implementation of computer in manufacturing – Experience systems in production and application using computers – Required files – Integration between computer aided manufacturing (CAM) and computer aided design (CAD) – Data base in manufacturing fields – Evaluation of cost using computer – Programming of machinability systems – Control – Robot.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	20%	30%	30%	10%	100%

B.2. *Course Objectives:*

This course introduces you to modern manufacturing with three areas of emphasis: computer aided design, computer aided manufacturing, and computer aided process planning. This course has two goals. First you will learn two CAD/CAM software: CAD software SolidWorks and CAM software

BobCAD/CAM. The second goal is to learn the important theory, concepts, technology, and the state-of-the-art development in CAD/CAM. It is very important to understand how the CAD/CAM systems work and know the current industry status. The subjects covered in this class include part design specification, NC programming, process planning, and Computer aided process planning (CAPP), CAD and CAM systems, and CAD/CAM data exchange.

1. .***B.3. Relationship between the course and the programe***

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B1,B2, B5	C1,C4	D2

B.4. *Intended Learning Outcomes (ILOs)*

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	a-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1-1 Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to manufacturing by computer
	a2. Know the exchangeable effect among the production engineering practices and reflection on the environment.	a2-1 Know the exchangeable effect among the production engineering practices affecting manufacturing .
Intellectual skills	b1. Analyze and evaluate the data and use them to solve the production engineering problems.	b1-1Analyze and evaluate the data and use them to solve the manufacturing problems
	b-2) Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2-1) Produce solutions to manufacturing problems through the application of production engineering knowledge.
	B-5) Evaluate the risks in the design of specific production engineering system.	b-5-1) Evaluate the risks in the design of the manufacturing system using simulation software
Professional skills	C1. Use efficiently the available tools as computer programs and measuring instruments as well as building ideas in the laboratory or through simulation and apply production engineering techniques.	Use efficiently the available tools as computer software to solve manufacturing problems
	C-4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.
General skills	D-2) Apply information technology tools related to specific production engineering	d-2-1) Apply information technology tools related to

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	discipline.	specific production engineering discipline.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Introduction	a1-1, a2-1, b1-1,b2-1, b5-1, C1-1,C4-1, d2-1
2	Fundamentals of CAD Systems	a1-1, a2-1, C4-1, d2-1, b5-1, C1-1
3	Fundamentals of CAM systems	A1-1, a2-1, C4-1, d2-1
4	Fields and applications	a1-1, a2-1, b5-1, C1-1
5	Implementation of computer in manufacturing	a1-1, a2-1, b5-1, C1-1
6	Integration between computer aided manufacturing (CAM) and computer aided design (CAD)	a1-1, a2-1, C4-1, d2-1
7	Data base in manufacturing fields	a1-1, a2-1,
8	Plastic stress-strain relations	a1-1, a2-1, C4-1, d2-1
9	Evaluation of cost using computer	a1-1, a2-1, b5-1, C1-1
10	Experience systems in production and application using computers	a1-1, a2-1,
11	Programming of machinability systems	a1-1, a2-1, C4-1, d2-1
12	Programming linear and contouring profile	a1-1, a2-1, b5-1, C1-1
13	CNC lathe programming	a1-1, a2-1, b5-1, C1-1
14	Control – Robot	a1-1, a2-1, b5-1, C1-1
15	General revision	a1-1, a2-1, b5-1, C1-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1-1, a2-1, b1-1,b2-1, b5-1, C1-1,C4-1, d2-1	a1-1, a2-1, b1-1,b2-1, b5-1, C1-1,C4-1, d2-1

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a2-1, b1-1,b2-1, b5-1, C1-1,C4-1, d2-1	a1-1, a2-1, b1-1,b2-1, b5-1, C1-1,C4-1, d2-1

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

Textbooks

• Required: None
• Recommended:

Computer-Aided Manufacturing; Tien-Chien Chang, Richard A. Wysk, and Hsu-Pin Wang, 2nd Ed. (1998), Prentice Hall. (ISBN 0-13-754524-X)
Reserved at Library Call No. TS155.6 C48 1998

Fundamentals of Graphics Communication, 3rd Ed. (2002), Gary Bertoline, Eric Wiebe, and Craig Miller, McGraw/Hill. (CAD drafting reference)

13.3- Recommended books

Automation, Production Systems, and Computer Aided Manufacturing, 2nd Ed. (2001), Mikell P. Groover, Prentice Hall. (ISBN 0-13-088978-4)***Periodicals, Web sites, Course notes, etc:***

1.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or show

Course coordinator

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

COURSE SPECIFICATION

Course Title:	Advanced Methods of measurements
Course Code:	PRE 612
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	2006

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification
1	**Credit hours**	**3** cr-hrs**.**
2	**Exam. Hours**	**3** hrs**.**
3	**Contact Hours**	**Lecture: 2** hrs/week**.**
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Master**
4	**Level at which this course is offered.**	**Level 600**
5	**Pre-requisites course.**	**Metrology & Calibration + Maintenance**
6	**Pre-requisites by Topic**	**Measuring Systems - Design of Instruments**
7	**Coordinator**	**Prof. Dr. Ahmed Mahmoud Easa + Dr. Faowqy Ramadan**
8	**External Evaluator(s)**	**Prof. Dr.**

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Advanced treatment with measuring instruments and measuring groups - Design of measuring instruments – Measuring errors and its static analysis – Calibration of measuring tools- Miscellaneous measurements – Sensors and transducers – Strain gauges and its use.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to build the capacities of the students to conduct quantitative research through application of advanced measuring methods and the analysis of classical model. Targets also includes, but not limited to:

1. Design the instruments, and collect primary data and analyze the measuring results.
2. Be able to present data; and
3. Have hands on both advanced measuring methods and advanced computer programs for monitoring the instrument under operating conditions.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3	B1, B5	C1,C2	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Apply knowledge of production engineering concepts in practice of advanced measurements.	a-1-1) Understand the fundamentals and knowledge of information technology in measuring practice errors.
	A-3) Apply advanced engineering technology in practice of measuring and calibration of instruments.	a-3-1) Know requirements for safe operation and conservation of measuring instruments.
Intellectual skills	B-1) Identify and analyze problems in the area of advanced calibration methods of instruments.	b-1-1) Able to use standard methods for calibrating the tools and instruments of measurements.
	B-5) Make career decisions in the light of available production engineering information about advanced methods of measurements.	b-5-1)Assess risks in professional practices of advanced measurements.
Professional skills	C-1) Apply the professional measuring technologies in the field of measurements.	c-1-1) Able to assess limitations and opportunities to decide on measuring instruments.
	C-2) Write professional calibration reports.	c-2-1) Write and evaluate professional reports in the field of measuring results.
General skills	D-2) Effectively communicate all kinds and sharing ideas with different measuring labs.	d-2-1) Use information technology of advanced measuring methods to serve the development of professional practice.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1.	Static characteristics of instruments.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1
2.	Measuring groups.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1,c-2-1
3.	Basics of the Design of measuring Tools.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1, c-2-1
4.	Design of measuring Tools.	a-1,a-3,b-1,b-2,c-1,c-2,d-1.
5.	Design of measuring instruments.	a-1,a-3,b-1,b-2,c-1,c-2,d-1.
6.	Static analysis of measuring errors.	a-1-1, a-3-1, b-1-1, b-5-1, c-2-1, , d-2-1.
7.	Calibration methods of measuring tools.	a-3-1, b-5-1, c-2-1, , d-2-1.
8.	Calibration chart of measuring tools.	a-3-1, b-5-1, c-2-1, , d-2-1.
9.	Application of the Calibration on some types of measuring Tools.	a-1-1,b-1-, b-5-1, c-2-1, d-2-1.
10.	Application of the Calibration on some types of measuring instruments.	a-1-1,b-1-, b-5-1, c-2-1, d-2-1.
11.	Basics of sensors and transducers.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1, c-2-1
12.	Methods of measuring using sensors.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1,c-2-1
13.	Methods of measuring using transducers.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1,c-2-1
14.	Basics of strain gauge.	a-1-1, a-3-1, b-1-1, b-5-1, c-1-1, c-2-1, d-2-1.
15.	Using (strain gauge) in measurements.	a-1-1, a-3-1, b-1-1, b-5-1, c-1-1,c-2-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	**Lectures, Exercises and Technical Reports.**	**a-1, a-3, b-1, b-5, c-1, c-2,**	**a-1, a-3, b-1, b-5, c-1, c-2, d-2,**

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	**a-1, a-3, b-1, b-5, c-1, c-2, d-2,**	**a-1, a-3, b-1, b-5,c-1, c-2, d-2,**

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

1. Ernest O. Doebelin " Measurement Systems Application and Design" Fourth Edition ,Tata , McGraw Company Limited,2000.
2. D.M.Anthony," Engineering Metrology ",Pergamon Press, New york,1987.
3. E.O. " Control System Principles and Design," Wiley , New York, 1985.

Periodicals, Web sites, Course notes, etc:

-Error Analysis, http://science.widener.edu/svb/stats/error.html, Scott Van Bramer.

-Error Analysis, http://teacher.nsrl.rochester.edu/phy_labs/AppendixB/AppendixB.html.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms, metrology and computer laboratories,.etc.).

1. Classroom.
2. Data show.

Course coordinator

Prof. Dr. Ahmed M. Easa.

Dr. Faowqy Ramadan

Head of Dept.

Prof. Dr. Taha El-Taweel

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Design for Manufacturing**
Course Code:	**PRE 613**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**21/3/2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof.**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Principles – Manufacturing materials – Design for different machining processes – Manual and automatic assembly – Automatic assembly using robots – Manufacturing and assembly integration.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to provide a broad practical introduction to design, and materials and manufacturing processes. It provides opportunities for learners to gain skills in designing and in communicating design proposals. It allows learners to explore the properties and uses of materials and to make models and prototypes of products. It also allows learners to consider the various factors that impact on a product's design. The learner will consider the life cycle of a product from

its inception through design, manufacture, and use, including its disposal or re-use. In addition it provide learners with opportunities to develop skills that are of general value for learning, life and work: the ability to read drawings and diagrams; the ability to articulate and communicate design ideas and practical details; the ability to devise and develop practical solutions to design problems, and the ability to manufacture their design ideas.

1. .***B.3. Relationship between the course and the programe***

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B1, ,B7	C3,C4	D2

B.4. *Intended Learning Outcomes (ILOs)*

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	a1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a1-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to Design for Manufacturing .
	a2. Know the exchangeable effect among the production engineering practices and reflection on the environment. .	. a2-1 Know the exchangeable effect among the production engineering practices affecting design and manufacture and reflection on the environment.
Intellectual skills	b1. Analyze and evaluate the data and use them to solve the production engineering problems.	b1-1 analyze the input data to take the proper decision in design
	b7. Take the suitable decision for different professional situations.	b7-1 Take the suitable decision for different professional situations according the exchangeable effect among the production engineering practices
Professional skills	c1. Use efficiently the available tools as computer programs and measuring instruments as well as building ideas in the laboratory or through simulation and apply production engineering techniques.	c1-1 Use efficiently the available tools as computer programs for design and final design
	c-4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others in the design and manufacture stages.
General skills	d-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to design and manufacture.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Principles of Design and Manufacturing	
2	Manufacturing materials	a1-1,a2-1,b1-1,b7-1,c1-1,c4-1,d2-1
3	Manufacturing materials	b1-1,b7-1, c4-1,d2-1
4	Design for different machining processes	a1-1,a2-1, c4-1,d2-1
5	Design for different machining processes	c1-1,c4-1, d2-1
6	Design for different machining processes	a1-1,a2-1 c1-1,c4-1
7	Manual and automatic assembly	a1-1,a2-1 c1-1,c4-1
8	Manual and automatic assembly	b1-1,b7-1, c4-1,d2-1
9	Application on Design for different machining processes	a1-1,a2-1, d2-1
10	Automatic assembly using robots	b1-1,b7-1, c4-1,d2-1
11	Automatic assembly using robots	a1-1,a2-1 c1-1,c4-1
12	Manufacturing and assembly integration	a1-1,a2-1 c4-1,d2-1
13	Manufacturing and assembly integration	b1-1,b7-1, d2-1
14	Manufacturing and assembly integration	a1-1,a2-1 c4-1,d2-1
15	General revision	b1-1,b7-1, a1-1,a2-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1-1,a2-1,b1-1,b7-1,c1-1,c4-1,d2-1	a1-1,a2-1,b1-1,b7-1,c1-1,c4-1,d2-1

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1,a2-1,b1-1,b7-1,c1-1,c4-1,d2-1	a1-1,a2-1,b1-1,b7-1,c1-1,c4-1,d2-1

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

13.3- Recommended books

1- W.F. Hosford and R. M. Caddell, " Metal forming" , Printce Hall Inc. , N.J., 1986.

Periodicals, Web sites, Course notes, etc:

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with LCD or show

Course coordinator

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minoufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Materials Handling Systems Design**
Course Code:	**PRE 614**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**20/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab:** - hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Sabry ElShakery**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Introduction (classification of such systems - Hoisting – conveying – Manipulating – systems) - Mechanical design methods of such systems- Kinematics and dynamics analysis - Design synthesis of such systems (to achieve maximum conveying) - capacity and/or specified conveying path) - Design Analysis of such system considering the undesirable phenomena -Dynamic stability of each systems

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of analyzing and classify of hoisting, conveying and manipulating systems. As well as, analyzing mechanical design methods of such systems dealing with kinematics and dynamics analysis for achieving maximum conveying capacity and/or achieving specified conveying path. Also, this course provide the student with

required skills of design analysis of such system considering the undesirable phenomena, dynamic stability of each systems.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2, A3& A4	B1, B2, B3& B4	C1,C2, C3&C4	D1

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1) Understand theory, basics and practices of mathematics, sciences and various design engineering technologies.	a1-1) Discuss the theory, basics and practices of mathematics, sciences which related to handling mechanisms and machines
	A2) Know the exchangeable effect among the machine design practices and reflection on the environment.	a2-1) Describe the exchangeable effect among using special handling machines and reflection on the environment.
	A3) Know the scientific developments in the machine design dealing with applied mechanics.	a31-) Discuss the scientific developments in the role of handling in engineering.
	A4) Know quality basics for working in the machine design field.	a4-1) List quality basics for working in the production engineering field dealing with handling mechanisms and machines.
Intellectual skills	B1) Analyze and evaluate the data and use them to solve the machine design and applied mechanics problems.	b1-1) Analyze and evaluate the data and use them to solve the handling machines problems.
	B2) Produce solutions of problems through the application of specific applied mechanics discipline knowledge based on limited and possible information.	b2-1) Create the suitable solutions to problems dealing with handling machines through the application of specific production engineering discipline knowledge.
	B3) Deal with different and contradicting knowledge to solve the problems.	b3-1) Design handling machines dealing with different and contradicting knowledge.
	B4) Evaluate the risks in the design of specific production engineering system.	b4-1) Evaluate the risks in the design of handling machines of specific production engineering system.
Professional skills	C1) Use efficiently available tools as computer programs as well as building ideas through simulation and applying applied mechanics techniques.	c1-1) Apply efficiently the available tools as computer programs and the suitable techniques for solving the handling machines problems.
	C2) Write technical reports.	c2-1) Write technical reports about handling mechanisms and machines.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C3) Evaluate the available methods and tools in the applied mechanics field.	c3-1) Evaluate the available different methods for solving the handling machines problems.
	C4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c4-1) Use different methods for solving the handling machines problems and compare the results with others.
General skills	D1) Communicate effectively in writing, verbally through illustrations.	d1-1) Write an a correct technical report with verbally.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Types of hoisting systems	a1-1, a2-1, b1-1, d1-1
2	Types of conveying systems	a1-1, a3-1, d1-1
3	Types of manipulating systems	a1-1, a3-1, c1-1, c2-1,
4	Types of spherical conveying mechanisms	a1-1, a2-1, b1-1
5	Introduction to kinematics analysis	a1-1, a4-1, c3-1, c4-1,
6	Kinematics analysis	b1-1, b2-1, b1-1, b2-1
7	Calculation the angular and linear velocity and acceleration	b2-1, b3-1, c1-1, c2-1,
8	Dynamic analysis	c1-1, c2-1, c3-1, c4-1,
9	Design synthesis conveying systems to achieve maximum conveying	a1-1, a2-1, c1-1, c2-1,
10	Design synthesis manipulating systems to achieve maximum conveying	a2-1, a4-1, d1-1
11	Design synthesis conveying systems to achieve maximum capacity or specified path	b3-1, b2-1, c2-1, c3-1,
12	Design synthesis manipulating systems to achieve maximum capacity or specified path	b1-1, b3-1, d1-1
13	Design Analysis of conveying system considering the undesirable phenomena	c1-1, c4-1, d1-1
14	Design Analysis of manipulating system considering the undesirable phenomena	b1-1, b4-1, c1-1, c3-1,
15	Applications	b3-1, b2-1, c2-1, c4-1,

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Discussion, Assignments and Exercises, Problem solving, Brain storming, Site visits, Discovering and Self-learning	a1-1, a2-1, a2-1, a3-1, a4-1, b1-1, b2-1, b3-1, b4-1, c1-1, c2-1, c3-1, c4-1, d1-1,	A1, A2, A3, A4, B1, B2 ,B3, B4, C1, C2, C3, C4, D1

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a2-1, a2-1, a3-1, a4-1, b1-1, b2-1, b3-1, b4-1, c1-1, c2-1, c3-1, c4-1, d1-1,	A1, A2, A3, A4, B1, B2 ,B3, B4, C1, C2, C3, C4, D1

Weighting of assessments:

Mid-Term Examination	**%**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

"Hand Book of pneumatic conveying engineering ", David Mills and others, Library of Congress

Recommended books

"Material Handling and Production Systems Modeling", Furman, Kei, Springer

Periodicals, Web sites, Course notes, etc:

1. http://hoistingequipment.economicalin.info/
2. http://manipulation.livejournal.com/profile

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.).

1. A lecture room with computer and LCD or data show

Course coordinator

Prof. Sabry El-Shakery
Dr/ Khaled Khader

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 20 November 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Mechanisms**
Course Code:	**PRE 615**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**20/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Sabry ElShakery**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Introduction (Mechanisms tapes - planar and spherical ones) - Kinematics analysis using vector methods - Dynamic analysis – Calculating of driving power or torque - Analysis – methods and Applications.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of analyzing mechanisms tapes which planar or spherical ones, as well as, kinematics analysis using vector methods and dynamic analysis . Also, this course provide the student with required skills of calculating the driving power or torque and analyzing methods in addition to some applications.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2, A3& A4	B1, B2, B3& B4	C1,C2, C3&C4	D1

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1) Understand theory, basics and practices of mathematics, sciences and various design engineering technologies.	a1-1) Discuss the theory, basics and practices of mathematics, sciences which related to Mechanisms
	A2) Know the exchangeable effect among the machine design practices and reflection on the environment.	a2-1) Describe the exchangeable effect among using special mechanisms and reflection on the environment.
	A3) Know the scientific developments in the machine design dealing with applied mechanics.	a31-) Discuss the scientific developments in the role of mechanisms in engineering.
	A4) Know quality basics for working in the machine design field.	a4-1) List quality basics for working in the production engineering field dealing with mechanisms.
Intellectual skills	B1) Analyze and evaluate the data and use them to solve the machine design and applied mechanics problems.	b1-1) Analyze and evaluate the data and use them to solve the mechanisms problems.
	B2) Produce solutions of problems through the application of specific applied mechanics discipline knowledge based on limited and possible information.	b2-1) Create the suitable solutions of problems dealing with mechanisms through the application of specific applied mechanics discipline knowledge.
	B3) Deal with different and contradicting knowledge to solve the problems.	b3-1) Design mechanisms dealing with different and contradicting knowledge.
	B4) Evaluate the risks in the design of specific production engineering system.	b4-1) Evaluate the risks in the design of mechanisms of specific production engineering system.
Professional skills	C1) Use efficiently available tools as computer programs as well as building ideas through simulation and applying applied mechanics techniques.	c1-1) Apply efficiently available tools as computer programs and the suitable techniques for solving the mechanisms problems.
	C2) Write technical reports.	c2-1) Write technical reports about mechanisms.
	C3) Evaluate the available methods and tools in the applied mechanics field.	c3-1) Evaluate the available different methods for solving the mechanisms problems.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C4) Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c4-1) Use different methods for solving the mechanisms problems and compare the results with others.
General skills	D1) Communicate effectively in writing, verbally through illustrations.	d1-1) Write an a correct technical report with verbally.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Types of joints and pairs	a1-1, a2-1, b1-1, d1-1
2	Types Mechanisms tapes	a1-1, a3-1, d1-1
3	Types of planar mechanisms	a1-1, a3-1, c1-1, c2-1,
4	Types of spherical mechanisms	a1-1, a2-1, b1-1
5	Introduction to kinematics analysis	a1-1, a4-1, c3-1, c4-1,
6	Kinematics analysis using vector methods	b1-1, b2-1, b1-1, b2-1
7	Calculation the angular and linear velocity	b2-1, b3-1, c1-1, c2-1,
8	Calculation the angular and linear acceleration	c1-1, c2-1, c3-1, c4-1,
9	Introduction to dynamic analysis	a1-1, a2-1, c1-1, c2-1,
10	Introduction to driving power or torque	a2-1, a4-1, d1-1
11	Calculating of driving torque of simple mechanism	b3-1, b2-1, c2-1, c3-1,
12	Calculating of driving power or torque for a complex mechanism	b1-1, b3-1, d1-1
13	Different methods of calculations	c1-1, c4-1, d1-1
14	Applications	b1-1, b4-1, c1-1, c3-1,
15	Advanced applications	b3-1, b2-1, c2-1, c4-1,

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Discussion, Assignments and Exercises, Problem solving, Brain storming, Site visits, Discovering and Self-learning	a1-1, a2-1, a2-1, a3-1, a4-1, b1-1, b2-1, b3-1, b4-1, c1-1, c2-1, c3-1, c4-1, d1-1,	A1, A2, A3, A4, B1, B2 ,B3, B4, C1, C2, C3, C4, D1

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a2-1, a2-1, a3-1, a4-1, b1-1, b2-1, b3-1, b4-1, c1-1, c2-1, c3-1, c4-1, d1-1	A1, A2, A3, A4, B1, B2 ,B3, B4, C1, C2, C3, C4, D1

Weighting of assessments:

Mid-Term Examination	**%**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

"Machines & Mechanisms: Applied Kinematic Analysis", David Myszka, Pearson Education,2012

Recommended books

"Introduction to Robotics", H. Harry Asada, Department of Mechanical Engineering, Massachusetts Institute of Technology.

Periodicals, Web sites, Course notes, etc:

1. http://www.journals.elsevier.com/mechanism-and-machine-theory/
2. http://mechanismsrobotics.asmedigitalcollection.asme.org/journal.aspx

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms and laboratories (i.e.; classrooms and laboratories, extent of computer access, etc.):-

1. A lecture room with computer and LCD or data show

Course coordinator

Prof. Sabry El-Shakery
Dr/ Khaled Khader

Head of Dept.

Prof. Taha El-Taweel

Date-- 20 November 2013

Minoufiya University,
Faculty of Engineering,
Prod. Eng. & Mech. Design Dept.

COURSE SPECIFICATION

Course Title:	Vibrations of Machines
Course Code:	PRE 617
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	2013

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	Credit hours	3cr-hrs	
2	Exam. Hours	3 hrs	
3	Contact Hours	Lecture: 3 hrs/week	Lab: - hrs/week
3	Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs.)	Production Engineering and Mechanical Design	
4	Level at which this course is offered.	M. Sc.	
5	Pre-requisites course.	None	
6	Pre-requisites by Topic	None	
7	Coordinator	Dr. Ahmed Hamada	
8	External Evaluator(s)	Prof. Dr.	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Concepts of vibration under harmonic excitation – Concepts of forced Vibration - Vibration of multi degrees of freedom system – Numerical methods for eigens solution - Random vibration.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objective for this course is for students to learn analytical, experimental, and numerical treatment of vibration phenomena.. Random vibration theories based on the Statistics, probability, and passive and active structural oscillation control are introduced. It also provides the student with an appreciation of the nature of noise and vibration hazards in the workplace and the effects of noise, and vibration, on people. It also details the approach in carrying out noise and vibration assessments in the workplace and in the general environment.

B.3. Relationship between the course and the programme

Field	National Academic Reference Standard (NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2, A3& A4	B1, B2, B3& B4	C1,C2, C3&C4	D1

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Understand theory, basics and practices of mathematics, sciences and various production-engineering technologies.	a1-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to the displine..
	a6. Understand principles and ethics of the scientific research	a6-1) Understand principles of mechanical vibrations. and construction of machine tools.
Intellectual skills	b2. Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b2-1) Produce solutions to vibration of machine tools with application of production engineering knowledge.
	b5. Evaluate the risks in the design of specific production engineering system.	b5-1) b-5-1) Evaluate the risks in the design of the macine and induced vibrations .
Professional skills	c3. Evaluate the available methods and tools in the production engineering field.	c3-1) Evaluate the available methods and tools in the production engineering field.
	c4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c4-1) Define, plan, analyze, and solve the engineering problems concerning vibration of machines to reach conclusions and compare the results with others.
General skills	D1) Communicate effectively in writing, verbally through illustrations.	d2-1) Apply information technology tools related to machine tool vibrations.
	d4. Use different resources to obtain knowledge and information	. d1) Use different resources such as the library and internet research to obtain knowledge and information

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Introduction and general knowledge	b2-1, b5-1, c3-1,c4-1, d2-1
2	Concepts of vibration under harmonic excitation	a1-1, a6-1, c3-1,c4-1, d2-1,
3	Concepts of vibration under harmonic excitation	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1,
4	Concepts of vibration under harmonic excitation	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1,
5	Concepts of forced Vibration	a1-1, b5-1, c3-1,c4-1, d2-1,
6	Concepts of forced Vibration	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1
7	Concepts of forced Vibration	a6-1, b2-1, b5-1, c3-1,c4-1
8	Vibration of multi degrees of freedom system	b2-1, b5-1, c3-1,c4-1, d2-1
9	Vibration of multi degrees of freedom system	a1-1, a6-1, b2-1, c3-1,c4-1, d2-1,
10	Vibration of multi degrees of freedom system	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1,
11	Numerical methods for eigens solution.	a1-1, a6-1, b2-1, b5-1, c4-1,
12	Numerical methods for eigens solution.	a1-1, c3-1,c4-1, d2-1,
13	Random vibration	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1,
14	Random vibration	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1,
15	General revision	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1,

B. 6. ***Teaching and Learning Methods:***

No.	**Teaching and Learning Methods**	**To Assess Course ILOs Item No.**	**To Assess (**ARSPE-PRE**) Outcomes No.**
1	Assignments and Exercises	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1

B. 7. ***Assessments:***

Student assessment methods:

No.	**Assessment methods**	**To Assess Course ILOs Item No.**	**To Assess (**ARSPE-PRE**) Outcomes No.**
1	Written exam	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1

Weighting of assessments:

Mid-Term Examination	- %
Final-Term Examination	100 %
Oral Examination	- %
Practical Examination	- %
Semester Work	- %
Other Types of Assessment	- %
Total	100 %

B.8. *List of References:*

Essential books (text books):

1-Cyril M.Harris"shock of machines with applications"4th edition,1976.
2-A.Maher"theory of machines with applications"1989
3. Andrew D. Dimarogonas, Sam Haddad, 1992, Vibration for Engineers, Prentice Hall, New Jersey
4. John M. Vance, 1988, Rotordynamics of Turbomachinery, John Wiley & Sons, Inc., New York
5. Michel Lalanne, Guy Ferraris, 1990, Rotordynamics Prediction in Engineering, John Wiley & Sons, Inc., New York
6. Textbook: Inman, D. J., 2007, *Engineering Vibration*, 3rd ed., Prentice-Hall
7-Meirovitch, L., 2001, *Fundamentals of Vibrations*, McGraw Hill
8-Kelly, G., 2000, *Fundamentals of Mechanical Vibrations*, 2nd ed., McGraw Hill

Periodicals, Web sites, Course notes, etc:

: http://pioneer.netserv.chula.ac.th/~pphongsa/

B. 9. *Facilities Required for Teaching and Learning:*

- lecture room with LCD or show

Course coordinator
Dr. Ahmed Hamada

Head of Dept.

Prof. Dr.Taha Ali El-Taweel

Date: 12 Nov. 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Advanced Dynamics of Structures
Course Code:	PRE 618
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	**21 / 3 / 2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -0** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**Master in Engineering**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Ahmed Hamada**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Pre-requisite: PRE 604
Parametric methods of dynamical systems - Mathematical models of dynamical structures – Design - modeling - simulation and analysis of results - Application of Matlab – Analysis of dynamical machines - Structural characteristics development - Control of mechanical vibration - Dynamic of structures - Predictive response and calculations of applied forced mechanical systems

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	**30%**	**30%**	**20%**	**10%**	**100%**

B.2. ***Course Objectives:***

The objective for this course is for students to understand the dynamic response and control of structures. It also provides students with methodology to construct the physical and mathematical models of structural oscillations and their mathematical solutions. It also expose the students the principles and methods of dynamic analysis of structures and to prepare them for designing the structures for different dynamic loads.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1,A6	B2,B5	C3,C4	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Understand theory, basics and practices of mathematics, sciences and various production-engineering technologies.	a1-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to dynamics of Structure
	a6. Understand principles and ethics of the scientific research	a6-1) Understand principles of dynamics and strucures
Intellectual skills	b2. Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b2-1) Produce solutions to dynamic of structure through the application of production engineering knowledge.
	b5. Evaluate the risks in the design of specific production engineering system.	b5-1) b-5-1) Evaluate the risks in the design of the structural dynamics
Professional skills	c3. Evaluate the available methods and tools in the production engineering field.	c3-1) Evaluate the available methods and tools in the production engineering field.
	c4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c4-1) Define, plan, analyze, and solve the engineering problems in the field of dynamics and structure to reach conclusions and compare the results with others.
General skills	d2. Apply information technology tools related to specific production engineering discipline.	d2-1) Apply information technology tools related to specific production engineering discipline.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Parametric methods of dynamical systems	b2-1, b5-1, c3-1,c4-1, d2-1,
2	Mathematical models of dynamical structures	a1-1, a6-1, c3-1,c4-1, d2-1
3	Mathematical models of dynamical structures	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1
4	Design - modeling - simulation and analysis of results	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1
5	Design - modeling - simulation and analysis of results	a1-1, b5-1, c3-1,c4-1, d2-1
6	Design - modeling - simulation and analysis of results	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1
7	–- Application of Matlab	a6-1, b2-1, b5-1, c3-1,c4-1, d2-1
8	Analysis of dynamical machines	b2-1, b5-1, c3-1,c4-1, d2-1,d4-1
9	Structural characteristics development	a1-1, a6-1, b2-1, c3-1,c4-1, d2-1
10	Control of mechanical vibration	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1
11	Dynamic of structures	a1-1, a6-1, b2-1, b5-1, c4-1, d2-1
12	Dynamic of structures	a1-1, c3-1,c4-1, d2-1
13	Predictive response and calculations of applied forced mechanical systems	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1,
14	Predictive response and calculations of applied forced mechanical systems	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1
15	Predictive response and calculations of applied forced mechanical systems	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1,	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1	a1-1, a6-1, b2-1, b5-1, c3-1,c4-1, d2-1

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

- Essential books (text books):

1. Mario Paz, Structural Dynamics : "Theory and Computation", Kluwer Academic Publication, 2004
2. Anil K.Chopra, "Dynamics of Structures", Pearson Education, 2001
3 John M.Biggs, "Introduction to Structural Dynamics", McGraw Hill, 1964

- Recommended books

4. Leonard Meirovitch, "Elements of Vibration Analysis", McGraw Hill, 1986
Engineering Structures", Elsevier Publications, 1984

Periodicals, Web sites, Course notes, etc:

1.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms

1. A lecture room with LCD or show

Course coordinator

Dr. Ahmed Hamada

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Dynamics of Multi-bodies systems**
Course Code:	**PRE 619**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**21 / 3 / 2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -0** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**Master in Engineering**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Mohamed Hesham Belal**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Introduction to rigid body mechanics, structural mechanics and continuum mechanics.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The aims of this course are to provide the Student, upon completing the Production Engineering Programme, with the basic knowledge and skills of how to analysis and formulate mathematical models of problems in dynamics of multi-bodies systems formed from collection of elastic and rigid

subsystems. This course will also provide students with the ability to improve the performance of multi-bodies systems with practical applications.
This course will also provide students with the required skills of identifying, formulating and solving fundamental engineering problems.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1,A3,A6	B1,B6	C3,C4	D1

B.4. ***Intended Learning Outcomes (ILOs)***

Field	**Programme ILOs that the course contribute in achieving**	**Course ILOs**
Knowledge& Understanding	A1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1 Recognize the main elements of a multi-bodies systems.
	A3. Know the scientific developments in the production engineering.	a-5 Identify Principles formulation of Hamltonian functions and derivation of canonical equations of motion
	A6. Understand principles and ethics of the scientific research.	a-17 Select Formulation of various types of generalized forces subjected to multi-bodies systems with applications
Intellectual skills	B1. Analyze and evaluate the data and use them to solve the production engineering problems.	b-2 Evaluate Dynamics of multi-bodies systems formed from collection of elastic and rigid subsystems.
	B6. Plan to develop performance of the production engineering systems.	b-13 Apply the principles of Stability of multi-bodies systems.
Professional skills	C3. Evaluate the available methods and tools in the production engineering field.	c-3 Employ a suitable techniques and software packages for the Computational methods
	C4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-17 Plan the Condensation techniques (Applications of various types of structural dynamic condensation process).
General skills	D1. Communicate effectively in writing, verbally and through illustrations and mathematical equations.	d-1 Judge the created soft-ware by working team.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	- Introduction to multi-bodies systems: - Concepts and Basic Technical terms. - Basic elements.	a1 &a3
2	- Kinematics of supports: - Constraints (Formulation types and classifications of kinematic constraints)	a1 &a6
3	Generalized forces (Formulation of various types of generalized forces subjected to multi-bodies systems with applications)	b1&a6
4	- Virtual work (kinematic and dynamic formulation with applications)	c3&b6
5	- Kinetic Analysis. - Energies of multi-bodies systems (formulation and types)	c4
6	- Lagrangian (formulation of lagrange equation of motion – practical application on multi-bodies mechanics.	c3&d1
7	- Hamiltonian (Principles formulation of Hamltonian functions and derivation of canonical equations of motion). - Practical Application.	c4&d1
8	- Condensation techniques (Applications of various types of structural dynamic condensation process).	a1 &a6
9	- Stability of multi-bodies systems (concepts conditions). - Rouith - Hurtiz criteria.	a3&a6
10	- Modeling of multi-bodies systems. - Finite Element Method – Continuous model.	a3 &a2
11	- Computational methods (Applications an discrete, distributed and discretized systems)	b1&c4
12	- Nonlinearity (concepts and applications)	c3&b6
13	- Mechanical of elastic bodies and applications.	c4
14	- Dynamics of multi-bodies systems formed from collection of elastic and rigid subsystems.	c3
15	- Discussion on some selected papers in the field.	c4&d1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1,	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1,a3,a6, b1,b6, c3,c4	a1,a3,a6, b1,b6, c3,c4

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

- Essential books (text books):

- Recommended books

1- **Ahmed Shabana , Dynamics of multi-bodies systems,**
2- **Meirovitch, Computational methods in structural dynamics,**
3- **Hurty, Dynamics of structures,**

Periodicals, Web sites, Course notes, etc:

1.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms

1. A lecture room with LCD or show

Course coordinator

Dr. Mohamed Hesham Belal

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Prod. Eng. & Mech. Design Dept.

COURSE SPECIFICATION

Course Title:	Mechanics of composite materials
Course Code:	PRE 620
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	2013

COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	Credit hours	3cr-hrs	
2	Exam. Hours	3 hrs	
3	Contact Hours	Lecture: 3 hrs/week	Lab: - hrs/week
3	Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs.)	Production Engineering and Mechanical Design	
4	Level at which this course is offered.	M. Sc.	
5	Pre-requisites course.	None	
6	Pre-requisites by Topic	None	
7	Coordinator	Dr. Badr Mohamed Badr Abdelbary	
8	External Evaluator(s)	Prof. Dr.	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

The purpose of this course is to introduce students to understand the topical problems of mechanics of advanced composite materials whose mechanical properties are controlled by high-strength and high-stiffness continuous fibers embedded in polymeric, metal, or ceramic matrix.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. ***Course Objectives:***

At the completion of this course it is desired that each student be able to:

1. Structures and properties of reinforcing fibers and matrix materials
2. Mechanics concepts of continuous and failure mechanisms of fiber composites.
3. Dynamics of composite materials.
4. Modeling of reinforced and particulate composite material.
5. Comparison between analytical and experimental results.

B.3. Relationship between the course and the programme

Field	National Academic Reference Standard (NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	a1, a2	b1, b4	c3,c4	d2, d4

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1-1) Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to the displine.
	a2. Know the exchangeable effect among the production engineering practices and reflection on the environment.	a-2-1) Understand structures and properties of reinforcing fibers and matrix materials.
Intellectual skills	b1. Analyze and evaluate the data and use them to solve the production engineering problems.	b-1-1 Knowledge of stress/strain, fracture, and fatigue of materials. b-1-2 Understand mechanics concepts of continuous and failure mechanisms of fiber composites
	b4. Implement a scientific and organized research for solving production engineering problems and select the most appropriate.	b-4-1 An ability to design composite components and apply processing methods to meet desired needs
Professional skills	c3. Evaluate the available methods and tools in the production engineering field.	c-3-1) Able to assess limitations of the available numerical methods.
	c4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1 Solve the engineering problems to reach conclusions and compare the results with others.
General skills	d-2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Apply information technology tools related to specific production engineering discipline.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Introduction: General Knowledge .	a1-1, a 2-1, b 1-1, b 4-1, d 2-1.
2	The simple concepts of mechanical behaviour, such as the broad meanings of stress and strain.	a1-1, a2-1, b1-2, b4-1, c3-1, c4-1.
3	Mechanical nature of composite materials based on theories of fibre mechanics	a1-1, a 2-1, b1-1, b1-2, b4-1, c3-1, c 4-1, d 2-1, d 4-1.
4	Mechanical nature of composite materials based on theories of fibre mechanics	a1-1, a 2-1, b1-1, b1-2, b4-1, c3-1, c 4-1, d 2-1, d 4-1.
5	Dynamics of composite materials	a1-1, a 2-1, b1-1, b1-2, b4-1, c3-1, c 4-1, d 2-1, d 4-1.
6	Dynamics of composite materials	a1-1, a 2-1, b1-1, b1-2, b4-1, c3-1, c 4-1, d 2-1
7	Modeling of reinforced and particulate composite material	a2-1, b1-1, b 4-1, c3-1, c4-1, d2-1
8	Modeling of reinforced and particulate composite material	a2-1, b1-1, b 4-1, c3-1, c4-1, d2-1
9	Modeling of reinforced and particulate composite material	a2-1, b1-1, b 4-1, c3-1, c4-1, d2-1,
10	Modeling of reinforced and particulate composite material	a2-1, b1-1, b 4-1, c3-1, c4-1, d2-1
11	Comparison between analytical and experimental results	a1-1, a2-1, b1-1, b 4-1, c3-1, c4-1, d2-1
12	Comparison between analytical and experimental results	a2-1, b1-1, b 4-1, c3-1, c 4-1, d 2-1
13	Software for design and analysis of composite structures.	a2-1, b1-1, b 4-1, c3-1, c4-1, d2-1
14	Software for design and analysis of composite structures.	a 2-1, b1-1, b 4-1, c3-1, c4-1, d2-1
15	General revision	a 2-1, b1-1, b 4-1, c3-1, c 4-1, d2-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Assignments and Exercises	a1-1, a2-1, b1-1, b 4-1, c3-1, c 4-1, d2-1, d 4-1.	a1-1, a2-1, b1-1, b 4-1, c3-1, c 4-1, d2-1, d 4-1.

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Written exam	a1-1, a2-1, b1-1, b 4-1, c3-1, c 4-1, d2-1	a1-1, a2-1, b1-1, b 4-1, c3-1, c 4-1, d2-1

Weighting of assessments:

Mid-Term Examination	- %
Final-Term Examination	100 %
Oral Examination	- %
Practical Examination	- %
Semester Work	- %
Other Types of Assessment	- %
Total	100 %

B.8. *List of References:*

Essential books (text books):

1. Isaac M. Daniel and Ori Ishai, Engineering Mechanics of Composite Materials, Copyright © 1994 by Oxford University Press Inc.
2. Valery V. Vasiliev and Evgeny V. Morozov, MECHANICS AND ANALYSIS OF COMPOSITE , @ 2001 Elsevier Science Ltd.
3. J. N. Reddy**,** Mechanics of Laminated Composite Plates and Shells, Theory and Analysis**,** CRC Press

Periodicals, Web sites, Course notes, etc:

1-. http**://www.tue.nl/bib**

2- Mechanics of Composite Materials, Second Edition Autar K Kaw *University of South Florida, Tampa, USA*

B. 9. *Facilities Required for Teaching and Learning:*

- lecture room with LCD or show

Course coordinator

Dr. Badr Mohamed Badr Abdelbary

Head of Dept.

Prof. Dr.Taha Ali El-Taweel

Date: 12 Nov. 2013

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Acceptance Sampling
Course Code:	PRE 621
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	20/9/2013

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification
1	**Credit hours**	3 cr-hrs.
2	**Exam. Hours**	3 hrs.
3	**Contact Hours**	Lecture: 3 hrs/week.
3	**Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs.)**	Master in Production Engineering
4	**Level at which this course is offered.**	Level 600
5	**Pre-requisites course.**	None
6	**Pre-requisites by Topic**	Statistical Quality Control
7	**Coordinator**	Dr. ABEER SOBHY EISA
8	**External Evaluator(s)**	Prof. Dr

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Pre-requisite: None
Basic concepts for acceptance sampling - Acceptance sampling for attributes - Acceptance sampling for variables - other acceptance sampling methods.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	**30%**	**30%**	**20%**	**10%**	**100%**

B.2. ***Course Objectives:***

The objective of this course after studying is to build the capacities of the students to :
1.Understand the operation of acceptance sampling schemes,
2.Be able to draw an operating characteristic for single sampling plans using attributes, double sampling plans using attributes, and single sampling plans for variables.
3. Be able to select appropriate plans to meet particular conditions.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B1,B4,	C1,C2	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Apply knowledge of production engineering concepts in operation of acceptance sampling schemes.	a-1-1) Integrate theories, fundamentals and knowledge of information technology in acceptance sampling.
	A-2) Identify professional production engineering problems and propose statistical solutions for them.	a-2-1) Understand the basics of quality in professional production statistical methods according to specialization.
Intellectual skills	B-1) Identify and analyze statistical problems in the area of acceptance sampling.	b-1-1) Able to use statistical methods for analyze operating characteristic for single sampling plans using attributes, double sampling plans and using attributes.
	B-4) Assess the risks in professional production engineering quality in practices.	b-4-1) Create the desired software dealing with the used statistical methods for analyzing Statistical problems of acceptance sampling.
Professional skills	C-1) Apply the professional production engineering technologies in the field of statistical quality control.	c-1-1) Able to assess limitations and opportunities to decide on solving the production quality problems.
	C-2) Write professional acceptance sampling report.	c-2-1) Write and evaluate professional reports in the field of acceptance sampling.
General skills	D-2) Effectively communicate all kinds and sharing ideas with different acceptance sampling reports.	d-2-1) Use information technology of acceptance sampling operation to serve the development of professional practice.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1.	Introduction to standard methods of acceptance sampling.	a-1-1, b-1-1, b-4-1, c-1-1
2.	Basic concepts for acceptance sampling.	a-1-1, b-1-1, b-4-1, c-1-1
3.	Analysis of acceptance sampling schemes.	a-1-1, b-1-1, b-4-1
4.	Introduction to acceptance sampling for attributes.	a-1-1, b-1-1, b-4-1, c-1-1
5.	Data analysis using acceptance sampling for attributes.	a-1-1, b-1-1, b-4-1
6.	Solving problems using acceptance sampling for attributes.	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
7.	Draw operation characteristics for single sampling plans usin attributes.	a-1-1, b-1-1, b-4-1
8.	Introduction to acceptance sampling for variables.	a-1-1, b-1-1, b-4-1, c-1-1
9.	Data analysis using acceptance sampling for variables.	a-1-1, b-1-1, b-4-1
10.	Solving problems using acceptance sampling for variables.	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
11.	Introduction to other different methods of acceptance sampling. .	a-1-1, b-1-1, b-4-1, c-1-1
12.	Solving problems using other methods of acceptance samplin	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
13.	Draw operation characteristics for single sampling plans using sampling for variables.	a-1-1, b-1-1, b-4-1
14.	Draw operation characteristics for some of other single sampling plans.	a-1-1, b-1-1, b-4-1
15.	Selections of appropriate plans to meet particular conditions.	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Lectures, Exercises and Technical Reports.	a-1, a-2, b-1, b-4, c-1, c-2	a-1, 2-3, b-1, b-5, c-1, c-2, d-2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a-2, b-1,b-4, c-1, c-2.	a-1, a-2, b-1,b-4, c-1, c-2, d-2

Weighting of assessments:

Mid-Term Examination	- %
Final-Term Examination	100 %
Oral Examination	- %
Practical Examination	- %
Semester Work	- %
Other Types of Assessment	- %
Total	100 %

B.8. ***List of References:***

Essential books (text books):

-Anderson R. G.; "Organization & Methods", N & E Hand book Series.
- Dale H. Besterfiled, et al., "Total Quality Management", Pearson Education, Inc. ISBN 81-297-0260-6.
-.Narendra Singh; "Project Management & Control"; Himalaya Publishing House, Mumbai.

Periodicals, Web sites, Course notes, etc:

- "ISO 9000 Quality Management System", International Trade Center, Geneva.
- Kaoru Ishikawa, "Guide to Quality Control", Asian Productivity Organization, Tokyo.

B. 9. ***Facilities Required for Teaching and Learning:***

Indicate requirements for the course including size of classrooms (i.e.; classrooms, metrology and computer laboratories,.etc.).
1. Classroom.
2. Data show.

Course coordinator

Dr. ABEER SOBHY EISA

Head of Dept.

Prof. Dr. Taha El-Taweel

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Total Quality Control
Course Code:	PRE 622
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	2012

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Omayma Nada**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Total quality control for manufacturing and service industries - Factors and tasks for controlling quality - Quality system method: its origin and its economics - Quality engineering technology - Engineering technology for process control - Engineering technology for quality information - Applying total quality control in a manufacturing environment.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	**30%**	**30%**	**20%**	**10%**	**100%**

B.2. *Course Objectives:*

The objective of this course is to provide the students with the underlying principles and techniques of Total Quality Control (TQC) with emphasis on their application to manufacturing organizations. Students will develop a working knowledge of the best practices in Quality and Process Control.

Students will learn to view quality in a holistic perspective as it must encompass all the phases in the manufacturing of a product. This includes design, manufacturing, quality checks, sales, after-sales services. This course stresses on the system approach to quality and the economics that govern cost-effective systems management.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2, A5	B2, B4, B6	C3,C4	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a1-1) Outline the history of quality and its role in corporate strategy and international competitiveness. a1-2) Compare and contrast different tools for quality improvement
	A2. Know the exchangeable effect among the production engineering practices and reflection on the environment.	a2-1) Recognize the main dimensions and perspectives of quality a2-2) Identify the critical factors affecting quality in manufacturing environment.
	A5. Know quality basics for working in the production engineering field	a5-1) Discuss the major concepts related to quality in manufacturing environment.
Intellectual skills	B2. Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b2-1) Investigate the sources quality problems b2-2) Suggest performance improvement opportunities
	B4. Implement a scientific and organized research for solving production engineering problems and select the most appropriate.	b4-1) Investigate customer requirements and create the appropriate quality policy to cost effectively satisfy these requirements
	B6. Plan to develop performance of the production engineering systems.	b6-1)Investigate the impact of quality on profitability b6-2) Create procedures and propose performance measures to evaluate different improvement alternatives
Professional skills	C3. Evaluate the available methods and tools in the production engineering field.	c3-1) Appraise different measuring and testing equipment c3-2) Select and apply the suitable tools for to design new products

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c4-1) Establish procedures for planning and analyzing quality activities c4-2) integrate multiple cross functional quality activities throughout an organization
General skills	D2. Apply information technology tools related to specific production engineering discipline.	d2-1) Demonstrate capabilities in using Minitab software for quality assessment and improvement

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Basic quality concepts and the evolution of quality movement	a1-1, a2-1, a5-1
2	The quality of products and services and total quality control	a2-1, a2-2, a5-1
3	Factors considered in controlling Quality	a2-1, a2-2, b2-1, b6-1
4	Jobs of quality control	a1-1, a1-2, a2-2, a5-1, b2-1, b2-2
5	The systems approach to quality	a2-1, a5-1, b6-1
6	Establishing the quality system	a2-2, a5-1, b2-1, b2-2, b4-1
7	Quality costs – foundation of quality systems economics	a2-1, a5-1, b6-1
8	Quality engineering technology	a1-2, a5-1, b6-2, c3-2
9	Techniques for formulation of quality policy	a2-1, b2-2, b4-1, b6-2
10	Quality engineering analytical techniques	a1-2, b2-1, c3-2, d2-1
11	Engineering technology for process control	a5-1, b2-1, b6-2
12	Machine and process capability analysis	a1-2, a5-1, b6-2, c3-1, d2-1
13	Quality information equipment engineering technology	a2-2, b2-2, c3-1
14	Applying total quality control in a manufacturing environment	a1-2, a2-2, b2-1, b2-2, b6-2, c3-1, c3-2, d2-1
15	Applying total quality control in a manufacturing environment	a1-2, a2-2, b2-1, b2-2, b6-2, c3-1, c3-2, d2-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Lectures/ Class discussions	a1-1, a1-2, a2-1, a2-2, a5-1, b21, b2-2, b4-1, b6-1, b6-2, c3-1, c3-2, c4-1, c4-2, d2-1	A1, A2, A5, B2, B4, B6, C3,C4, D2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a1-2, a2-1, a2-2, a5-1, b21, b2-2, b4-1, b6-1, b6-2, c3-1, c3-2, c4-1, c4-2	a1, a2, a5, b2, b4, b6, c3,c4

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

Feigenbaum, A. V., Total Quality Control, 3rd edition, McGraw-Hill, 1983.

Recommended books

Besterfield, Total Quality Management, Pearson Education, 2011

Periodicals, Web sites, Course notes, etc:

American Society for Quality Control
http://asq.org/index.aspx
International Journal of Quality & Reliability Management
http://www.emeraldinsight.com/products/journals/journals.htm?id=ijqrm

International Journal of Productivity and Quality Management
http://www.inderscience.com/jhome.php?jcode=IJPQM#moredesc

B. 9. *Facilities Required for Teaching and Learning:*

1. A lecture room with the following facilities (Data show, screen, and laptop , white board and colored pens)
2. Computer lab with Minitab 16 software installed

Course coordinator

Dr. Omayma Nada

Head of Dept.
Prof. Taha El-Taweel

Date: / /

Minoufiya University,
Faculty of Engineering,
Prod. Eng. & Mech. Design Dept

COURSE SPECIFICATION

Course Title:	**Design and Analysis of Experiments**
Course Code:	**PRE 623**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification
1	**Credit hours**	**3**cr-hrs
2	**Exam. Hours**	**3** hrs
3	**Contact Hours**	**Lecture: 3** hrs/week | **Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**
4	**Level at which this course is offered.**	**M. Sc.**
5	**Pre-requisites course.**	**None**
6	**Pre-requisites by Topic**	**None**
7	**Coordinator**	**Prof. Mohamed Fatouh Abdelhamed** **Prof. Taha Ali El-Taweel**
8	**External Evaluator(s)**	**Prof. Dr.**

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Design and Analysis of Experiments is a powerful technique used for exploring new processes, gaining increased knowledge of the existing processes and optimizing these processes for achieving world class performance. It also gives a solid introduction to the technique through a myriad of Practical examples and case studies.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	**30%**	**30%**	**20%**	**10%**	**100%**

B.2. *Course Objectives:*

The objective of this course is to build the capacities of the students to:

1. Learn how to apply design and analysis of experiments in their own work environment.

2. Develop a sound understanding of the theory of design and analysis of experiments and practical aspects of how to design, analyze and interpret the results of a designed experiment
3. Explore the relationships between the key input process variables (or factors) and the output performance characteristics (or quality characteristics).
4. Improve profits and return on investment.

B.3. Relationship between the course and the programme

Field	National Academic Reference Standard (NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3	B1, B6	C1,C4	D1, D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies	a-1-1 Understand theory, basics and practices of mathematics, sciences and various production engineering technologies related to Design and Analysis of Experiments
	a3. Know the scientific developments in the production engineering	a-5-1) Know the scientific developments in the production engineering for exploring new processes
Intellectual skills	b1. Analyze and evaluate the data and use them to solve the production engineering problems.	b-1-1) Create solutions to manufacturing problems through the applications of Design and Analysis of Experiments.
	b6. Plan to develop performance of the production engineering systems.	b-6-1) Plan to develop performance of the production engineering systems throughout optimum Design and Analysis of Experiments
Professional skills	c1. Use efficiently the available tools as computer programs and measuring instruments as well as building ideas in the laboratory or through simulation and apply production engineering techniques.	c-1-1) Use efficiently the available tools as computer programs and measuring instruments and apply Design and Analysis of Experiments
	c4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4-1) Solve the engineering problems to reach conclusions and compare the results with others throughout the design and analysis of experiments.
General skills	D1. Evaluate him-self and determine his personal education needs	d-1-1 Evaluate him-self and determine his personal education needs concerning Design and

Field	Programme ILOs that the course contribute in achieving	Course ILOs
		Analysis of Experiments
	D2. Use different resources to obtain knowledge and information.	d-2-1) Share different resources to obtain knowledge and information about Design and Analysis of Experiments

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Introduction	a1-1,a3-1,b1-1.d3-1,d2-1
2	Experiment with single factor (analysis of variance)	a1-1,a3-1,b1-1, c1-1,c4-1
3	Experiment with single factor(analysis of variance) (continued)	b1-1,b6-1,c1-1, a1-1,a3-1
4	Experiment with single factor(analysis of variance) (continued)	a1-1,a3-1,b1-1, c1-1,c4-1
5	Randomized block and latin squre designs	a1-1,a3-1,b1-1 c1-1,c4-1
6	Randomized block and latin squre designs(continued)	a1-1,a3-1,b1-1
7	Randomized block and latin squre designs(continued)	b1-1,b6-1,c1-1
8	Incomplete block design	b1-1,b6-1, a1-1,a3-1
9	Incomplete block design (continued)	b1-1,b6-1,c1-1, a1-1,a3-1
10	Incomplete block design (continued)	a1-1,a3-1,b1-1 c1-1,c4-1
11	Introduction to factorial designs	c1-1,c4-1.d3-1,d4-1
12	Introduction to factorial designs (continued)	b1-1,b6-1, a1-1,a3-1
13	Response surface methods and design	c1-1,c4-1.d3-1,d1-1
14	Response surface methods and design (continued)	b1-1,b6-1,c1-1, a1-1,a3-1
15	Response surface methods and design (continued)	c1-1,c4-1.d3-1,d2-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Assignments and Exercises	A1, A3, B1, B6, C1,C4, D1, D2	A1, A3, B1, B6, C1,C4,D1, D2

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSPE-PRE) Outcomes No.
1	Written exam	A1, A3, B1, B6, C1,C4, D1, D2	A1, A3, B1, B6, C1,C4,D1, D2

Weighting of assessments:

Mid-Term Examination	- %
Final-Term Examination	100 %
Oral Examination	- %
Practical Examination	- %
Semester Work	- %
Other Types of Assessment	- %
Total	100 %

B.8. *List of References:*

Essential books (text books):

1- Jiju Antony "Design of Experiments for Engineers and Scientists", Linacre House, Jordan Hill, Oxford OX2 8DP, 2003.

2- Montgomery, D. C. *Design and Analysis of Experiments*, 2001 (Wiley & Sons, New York).

3- Myers, R. H. and Montgomery, D. C. *Response Surface Methodology*, 1995 (Wiley & Sons, New York).

Periodicals, Web sites, Course notes, etc:

1- Derringer, G. and Suich, R. Simultaneous optimization of several response variables. *J. of Qual. Techn.*, 1980, 12, 214-219.

2- Castillo, E. D., Montgomery, D. C. and McCarville, D. R. Modified desirability functions for multiple response optimization, *J. of Qual. Techn.*, 1996, 28, 337-345.

B. 9. *Facilities Required for Teaching and Learning:*

- lecture room with LCD or Data show

Course coordinator

Prof. **Mohamed Fatouh Abdelhamed**
Prof. Taha Ali El-Taweel

Head of Dept.

Prof. Dr.Taha Ali El-Taweel

Date-- 5 Feb. 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Time and Motion Study**
Course Code:	**PRE 624**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	3 hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Omayma Nada**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Productivity - Flow process charts - man-machine charts - Analysis of activity - Motion study - time study - Determine the performance and allowance factors - Determine the standard time for an activity.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	**30%**	**30%**	**20%**	**10%**	**100%**

B.2. ***Course Objectives:***

The purpose of this course is to provide students with the basic principles that underlie the successful application of motion and time study and to supplement these principles with illustrations and practical examples. This course is mainly concerned with the essential skills for analyzing and improving working methods, procedures and systems in the context of a manufacturing environment in order to achieve productivity improvements, improve equipment utilization, conserve materials and energy, reduce human effort, and advance organizational goals.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B1,B4	C3,C4	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	**Programme ILOs that the course contribute in achieving**	**Course ILOs**
Knowledge & Understanding	A1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a1-1)Identify different work measurement techniques a1-2) Explain motion study procedure a1-3) Recognize productivity measures. a1-4) Identify factors affecting productivity and improvement techniques
	A2. Know the exchangeable effect among the production engineering practices and reflection on the environment.	a2-1) Explain how motion and time study can increase productivity
Intellectual skills	B1. Analyze and evaluate the data and use them to solve the production engineering problems.	b1-1) Design and implement different time study techniques b1-2) Establish and improve work standards b1-3) Design a work sampling study, apply it to various work situations, analyze the results, and estimate the standard time for the work involved b1-4) Record and analyze selected tasks using different flowcharts
	B4. Implement a scientific and organized research for solving production engineering problems and select the most appropriate.	b4-1) Examine an existing work situation and conduct a work improvement program in order to identify low productivity causes. b4-2) Select the applicable work measurement technique
	B6. Plan to develop performance of the production engineering systems.	b6-1) Use problem-solving skills and creativity to determine the ideal method or approach to obtain a solution to increase efficiency b6-2) Apply principles of motion economy to improve performance

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Professional skills	C3. Evaluate the available methods and tools in the production engineering field.	c3-1) Apply statistical sampling techniques in order to effectively measure the utilized resources and to estimate their corresponding work content
	C4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c4-1) Determine the best sequence of doing work c4-2) Develop more productive work systems through analyzing real life work systems and assessing the reasons of inefficiencies
General skills	D2. Apply information technology tools related to specific production engineering discipline.	d2-1) Use spreadsheets to develop time standards.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	The concept of productivity/ Factors affecting productivity	a1-1, a1-4, a2-1
2	Measures for total and partial productivity	a1-3
3	Productivity Improvement Techniques	a1-4, a2-1, b6-1
4	Scope and history of Motion and Time Study	a2-1, b6-1
5	The general problem solving process Work methods design	a1-2, a2-1, c4-1
6	Process Analysis Activity Charts- Man and Machine charts	a1-2, b1-4
7	Basic Motion Elements and Work Analysis	a1-2, b1-4
8	Principles of Motion Economy	a1-2, b6-2
9	Time Standards and How They Are Determined	a1-1, b1-1, b1-2, b1-3
10	Direct Time Study	a1-1, b1-1
11	Predetermined Motion Time Systems	a1-1, b1-1
12	Performance Rating Time Study Equipment	a1-1, b1-1, b1-2
13	Work Sampling	a1-1, b1-1, b1-3, c3-1
14	Develop time standards using spreadsheets	d2-1
15	Applications of Time Standards and Time Study	d2-1, b1-1, b1-3, b1-4, b6-1, b6-2, c3-1, c4-1, c4-2

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Lectures	a1-1, a1-2, a1-3, a1-4, a2-1, b1-1, b1-2, b1-3, b1-4, b4-1, b4-2, b6-1, b6-2, c3-1, c4-1, c4-2, d2-1	A1, A2, B1, B4, C3, C4, D2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a1-2, a1-3, a1-4, a2-1, b1-1, b1-2, b1-3, b1-4, b4-1, b4-2, b6-1, b6-2, c3-1, c4-1, c4-2	A1, A2, B1, B4, C3, C4

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

M. P. Groover, Work Systems and the Methods, Measurement, and Management of Work, Pearson Prentice Hall, 2007

Ralph M. Barnes, Motion and Time Study –Design and Measurement of Work, 7th ed.,. John Wiley & Sons, 1980.

Recommended books

Motion and Time Study for Lean Manufacturing, 2nd ed., F.E. Meyers, Prentice Hall, 1999.

Methods, Standards and Work Design, by B. W. Niebel and A. Freivalds, 12th ed., McGraw-Hill, 2008.

Periodicals, Web sites, Course notes, etc:

International Journal of Productivity and Performance Management
http://www.emeraldinsight.com/products/journals/journals.htm?id=ijppm

B. 9. *Facilities Required for Teaching and Learning:*

1. A lecture room with the following facilities (Data show, screen, and laptop , white board and colored pens)

Course coordinator

Dr. Omayma Nada

Head of Dept.
Prof. Taha El-Taweel

Date: / /

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Menoufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Inventory and materials Management
Course Code:	PRE 625
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	21 / 3 / 2012

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification
1	**Credit hours**	**3**cr-hrs
2	**Exam. Hours**	**3** hrs
3	**Contact Hours**	**Lecture: 3** hrs/week | **Lab: -0** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**
4	**Level at which this course is offered.**	**Master in Engineering**
5	**Pre-requisites course.**	**None**
6	**Pre-requisites by Topic**	**None**
7	**Coordinator**	**Dr. Mohamed Hesham Belal**
8	**External Evaluator(s)**	**Prof.**

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Types of inventories and its function-Inventory systems-ABC inventory analysis-Basic inventory models-Lot sizing techniques-MRP- Probabilistic inventory models-Theory of constraints.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The aims of this course are to provide the Student, upon completing the Production Engineering Programme, with the basic knowledge and skills of how to control or management of various

inventory systems and formulate mathematical inventory models of problems in fixed and variable demands. This course will also provide students with the ability to make the probabilistic inventory models and state the theory of constraints.
This course will also provide students with the required skills of identifying, formulating and solving fundamental engineering problems.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1,A3,A5	B2,B7	C3,C4	D1,D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a-1 Recognize the Types of inventories and its function.
	A3. Know the scientific developments in the production engineering.	a-3 Identify the different types of Basic Inventory models.
	A5. Know quality basics for working in the production engineering field.	a-5 Select the suitable Lot sizing Techniques
Intellectual skills	B2. Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b-2 Solve the Probabilistic inventory models and safety stock.
	B7. Take the suitable decision for different professional situations.	b-7 Take the suitable decision for Basic Inventory models.
Professional skills	C3. Evaluate the available methods and tools in the production engineering field.	c-3 Evalute a suitable techniques and software packages for the Techniques of Inventory control.
	C4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4 Solve the Theory Of Constraints (TOC) and its types.
General skills	D1. Evaluate him-self and determine his personal education needs.	d-1 Judge the created soft-ware by working team.
	D2. Manage the time efficiently.	d-2 Balance between computer facilities resources and programming time.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	- Types of inventories and its function .	a3 &a2
2	- Inventory control – Techniques of Inventory control.	a5 &a2
3	– ABC Inventory analysis – Inventory Valuation.	b7&a5
4	- Basic Inventory models – Economic Order Quantity (EOQ)	c3&b2
5	- Basic Inventory models – Economic Production Quantity (EPQ)	c4
6	- Lot sizing Techniques - Characteristics of Net Requirement Demand.	c3
7	- Lot sizing Procedure – Buffering Concepts.	c4&d3
8	- Material Requirement Planning (MRP) – Objective of MRP.	a1 &a5
9	- MRP input – Variable and Random Demand Models.	a1 &a3
10	- Just In Time Production (JIT)	a5 &c3
11	- Lean Production – Tools of Lean Production.	b2&a17
12	- Probabilistic inventory models and safety stock.	c4&b7
13	- Theory Of Constraints (TOC).	c3&d7
14	- Types of constraints (Physical – Market – Policy)	c3&d3
15	- Local Performance Measures. - The Production Decision.	c4&d7

B. 6. ***Teaching and Learning Methods:***

Course Intended learning outcomes (ILOs)		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Site visits	Self learning	Cooperative	Discovering	Modelling	Playing
Knowledge & understanding	**a1**	**x**		**x**		**x**								
	a3	**x**		**x**		**x**								
	a5	**x**		**x**		**x**								
Intellectual Skills	**b2**	**x**		**x**		**x**								
	b7	**x**		**x**		**x**								
Professional Skills	**c2**	**x**		**x**		**x**								
	c7	**x**		**x**		**x**								
General Skills	**d3**		**x**							**x**	**x**			
	d7		**x**							**x**	**x**			

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1,a3,a5, b2,b7, c36,c4	a1,a3,a5, b2,b7, c36,c4

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

- Essential books (text books):

- Recommended books

1- . **S.Anil Kumar – N. Suresh, Operations Management , New Age International Limited, 2009.**

2- **Joseph, G.Monks, Theory and Problems of Operations Management , McGraw-Hill, 2nd Edition, 2004**

Periodicals, Web sites, Course notes, etc:

1.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms

1. A lecture room with LCD or show

Course coordinator

Dr. Mohamed Hesham Belal

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Production planning and control**
Course Code:	**PRE 626**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**21 / 3 / 2012**

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	3 hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -0** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**Master in Engineering**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Ahmed Mousa Abo elenin**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Types of planning activities - Aggregate production planning - Master production scheduling (MPS) - Capacity planning - Capacity planning models - JIT production system - input/output analysis.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	30%	20%	10%	100%

B.2. *Course Objectives:*

The objectives of this course are to provide the Student, upon completing the Production Engineering Programme, with the basic knowledge and skills of how to control or management of production systems to ensure that production operations and actual performance occur according to planned operations and performance. This course will also provide students with the ability to make the. To make the product using the best and cheapest methods.

This course will also provide students with the required skills of identifying, formulating and solving fundamental engineering problems.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	a1,a3,a5	b2,b7	c3,c4	d3,d7

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a1-1) Recognize the production planning and it's function
	a3. Know the scientific developments in the production engineering.	a3-1) Identify the different types of production
	a5. Know quality basics for working in the production engineering field.	a5-1) Select the techniques for absorbing fluctuations in demand
Intellectual skills	b2. Produce solutions to problems through the application of specific production engineering discipline knowledge based on limited and possible information.	b2-1) Solve the technological forecasting problems.
	b7. Take the suitable decision for different professional situations.	b7-1) Take the suitable decision for panning process
Professional skills	c3. Evaluate the available methods and tools in the production engineering field.	c3-1) Evaluate the aggregate production planning
	c4. Define, plan, analyze, and solve the engineering problems to reach conclusions and compare the results with others.	c-4 Solve the capacity planning models..
General skills	D2. Evaluate him-self and determine his personal education needs.	D2-1) Judge the created soft-ware by working team.

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	- Types of planning activates	a1-1,a3-1,a5-1, ,b7-1, c3-1,c4-1,
2	- factors affecting ppc	a1-1,a3-1,a5-1, b2-1,b7-1,d7-1
3	– function of ppc	a1-1,a5-1,b7-1, c3-1,c4-1, d3-1,d7-1
4	- forecasting techniques	a1-1,a3-1,a5-1, b2-1,b7-1, ,d2-1
5	- process planning	a1-1,a3-1,a5-1, c3-1,c4-1, d3-1,d2-1
6-8	- Aggregate production planning	,b7-1, c3-1,c4-1, d2-1
9-11	- scheduling and control of production	,b7-1, c3-1,c4-1,d2-1
12	- capacity planning models	a1-1,a3-1,a5-1, b2-1c4-1,d2-1
13	- JIT production system input / output	a1-1,a3-1, c3-1,c4-1, d3-1,d2-1
14	- Scheduling and computer	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1,d2-1
15	- Control of production	a1-1,a3-1,a5-1, b2-1,b7-1, d2-1

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1, d2-1	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1, d2-1

B. 7. ***Assessments:***

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1, d2-1	a1-1,a3-1,a5-1, b2-1,b7-1, c3-1,c4-1, d2-1

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. ***List of References:***

- Essential books (text books):

- Recommended books

1- **N. Gaither Production and Operation Management, 6th ed.Fort Worth,Tx: The Dry den Press 2009.**
2- **W.J. Stevenson, Production and Operation Management, 5th .ed.Chicago : Richard D.Irwin, 2007.**

Periodicals, Web sites, Course notes, etc:

1.

B. 9. *Facilities Required for Teaching and Learning:*

Indicate requirements for the course including size of classrooms

1. A lecture room with LCD or show

Course coordinator

Dr. Ahmed Mousa Abo-Elenin

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 19 March 2012

Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	Project Management
Course Code:	PRE 627
Department Offering the Course:	Production Engineering and Mechanical Design
Last Date of Approval:	2012

A- COURSE IDENTIFICATION AND INFORMATION:

No.	Item	Specification	
1	**Credit hours**	**3**cr-hrs	
2	**Exam. Hours**	**3** hrs	
3	**Contact Hours**	**Lecture: 3** hrs/week	**Lab: -** hrs/week
3	**Program(s) in which the course is offered.** (If general elective available in many programs indicate this rather than list programs.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**M. Sc.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Omayma Nada**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

B.1. *Description as in Post Graduate Studies Bulletin:*

Defining a project - determining the project activities - planning projects through network analysis - CPM and PERT techniques - time-cost tradeoff - project budgeting - project management under limited resources

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	**30%**	**30%**	**20%**	**10%**	**100%**

B.2. *Course Objectives:*

This course is designed to provide students with the basic concepts and techniques associated with project management. This course introduces the critical path method (CPM) and the program evaluation and review technique (PERT) as two management science techniques developed to plan,

schedule, and control large, complex projects with many activities. A strong emphasis will be given also to decisions related to time-cost trade-offs and project budgeting. In addition, the student would be qualified with basics of some software packages for project management.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B1, B5, B7	C1, C2	D2

B.4. ***Intended Learning Outcomes (ILOs)***

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1. Understand theory, basics and practices of mathematics, sciences and various production engineering technologies.	a1-1) Identify key decisions in project management a1-2) Recognize characteristics and life cycle of a project a1-3)Explain optimistic, most likely, and pessimistic time estimates as well expected activity time estimates.
	A2. Know the exchangeable effect among the production engineering practices and reflection on the environment.	a2-1) Discuss the nature and importance of a Work Breakdown Structure (WBS) a2-2) Map (WBS) with the Organizational Breakdown Structure
Intellectual skills	B1. Analyze and evaluate the data and use them to solve the production engineering problems.	b1-1) Formulate the crashing problem as a linear programming model b1-2) Decompose the project into smaller activities b1-3) Create the network model according to the precedence relations among activities
	B5. Evaluate the risks in the design of specific production engineering system.	b5-1) Estimate expected time required for activity completion. b5-2) Compute the critical path, the project completion time and its variance b5-3) Compute the probability of the project being completed by a specific time.
	B7. Take the suitable decision for different professional situations.	B7-1 Find the least expensive way to shorten the duration of a project to meet a target completion date.
Professional skills	C1. Use efficiently the available tools as computer programs and measuring instruments as well as building ideas in the laboratory or through simulation and apply production engineering	c1-1)Apply PERT/CPM techniques to case studies c1-2) Apply MS project management to develop (WBS) c1-3) Demonstrate capabilities in using Primavera software to manage projects

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	techniques.	
	C2. Write and evaluate technical reports.	c2-1) Implement projects effectively and use appropriate follow-up methods. c2-2) Document results related to critical activities identified, project completion time, etc.
General skills	D2. Apply information technology tools related to specific production engineering discipline.	d2-1) Use some of the specialized software available in the market for scheduling and tracking project activities

B.5. ***Syllabus to be Covered:***

Week No.	Contents	ILOs covered by this topic
1	Introduction to project management The nature of projects – key decisions in project management	a1-1
2	Project life cycle	a1-2
3	Work Breakdown Structure (WBS)	a2-1,a2-2, b1-2, c1-1, c1-2
4	Project Network Representation PERT/CPM	b1-2, b1-3, c1-1
5	Project scheduling with deterministic activity durations	b1-3, b5-1, c1-1
6	Computing Algorithm (forward/backward pass)	b5-1, b5-2, c1-1
7	Project scheduling with probabilistic activity durations	a1-3, b5-2, b5-3¸ c1-1
8	Probabilistic time estimates- determining path probabilities	a1-3, b1-3, b5-1, b5-2, b5-3, c1-1
9	Uses of simulation in project scheduling	b5-1, b5-2
10	Time-cost trade-offs: Crashing	b1-1, b7-1
11	Project Budgeting & cost estimating	b7-1¸ c1-1
12	Using Linear Programming to Make Crashing Decisions	b1-1, b7-1
13	Project scheduling software (Microsoft Project)	c1-1, c1-2, d2-1
14	Project scheduling software (Primavera)	c1-1, c1-3, d2-1
15	Project monitoring & control	c2-1, c2-2

B. 6. ***Teaching and Learning Methods:***

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Lectures	a-1, a1-2, a1-3, a2-1, a2-2, b1-1, b1-2, b1-3, b5-1, b5-2, b5-3, b7-1, c1-1, c1-2, c1-3, c2-1, c2-2, d2-1	A1, A2, B1, B5, B7, C1, C2,D2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a1-2, a1-3, a2-1, a2-2, b1-1, b1-2, b1-3, b5-1, b5-2, b5-3, b7-1, c1-1, c1-2, c1-3, c2-1, c2-2	A1, A2, B1, B5, B7, C1, C2

Weighting of assessments:

Mid-Term Examination	**- %**
Final-Term Examination	**100 %**
Oral Examination	**- %**
Practical Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

Jack R. Meredith and Samuel J. Mantel, Project Management: A Managerial Approach, 7th edition, John Wiley & Sons Ltd, 2009.

Recommended books

William J. Stevenson, “Operations Management”, 11th Ed., McGraw Hill, USA 2012

Periodicals, Web sites, Course notes, etc:

The Project Management Institute (PMI)
http://www.pmi.org/
Primavera Enterprise Project Portfolio Management
http://www.oracle.com/us/products/applications/primavera/overview/index.html

B. 9. *Facilities Required for Teaching and Learning:*

1. A lecture room with the following facilities (Data show, screen, and laptop , white board and colored pens)
2. Computer lab with MS Project and Primavera software installed

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Course coordinator

Dr. Omayma Nada

Head of Dept.
Prof. Taha El-Taweel

Date: / /