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

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Engineering Materials**
Course Code:	**PRE 501**
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.**	**Diploma**
5	**Pre-requisites course.**	**None**
6	**Pre-requisites by Topic**	**None**
7	**Coordinator**	**Dr. Mohammed Ashrf Saad**
8	**External Evaluator(s)**	**Prof.**

B- PROFESSIONAL INFORMATION:

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

Metallic Materials: Processing-Crystal-imperfections-Important metallic alloys – Polymer materials – Composite materials - Ceramic Materials Magnetic Materials – Criteria for materials selection.

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 enough *science* so that the reader may understand basic materials phenomena, and enough *engineering* to prepare a wide range of students for competent professional practice. It also provides the proper balance of breadth and depth for the subject at hand, to provide rigor at the appropriate level, to provide meaningful examples and up to date content, and to stimulate the intellectual excitement of the student. This course introduces students to engineering materials in general and focuses on Metallic Materials.. The course will further explain the factors affecting the strength of engineering materials and introduces some of the fundamental concepts of how to design successful engineering material 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	b1, b2	c1,c2	d2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	a1. Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice..	a1-1 **Recognize** knowledge of mathematics, science and engineering concepts.
	a3. Know requirements for safe operation and conservation of the environment.	a2-1 **Demonstrate** understanding of structure and curing mechanisms of different engineering materials including composite materials a2-2 **Identify** hazards and protections required when working with different engineering
Intellectual skills	b1. Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities. .	b1-1 **Design** the material selection methods such as cost vs. property analysis and weighted property comparison method
	b2. Solve production engineering problems in the area of specialized career. .	b2-1 **Employ** a suitable techniques to the discipline and understanding the best method for solving engineering problems
Professional skills	c1. Apply the professional production engineering technologies in the field of specialization.	c1-1 **Employ** a suitable techniques to the discipline and understanding the best method for solving engineering problems
	c2. Write professional production engineering reports	C2-**1** Write professional production engineering reports.
General skills	d2. Use information technology to serve the development of production engineering professional practice.	d2-1) **Balance** between laboratory facilities resources for conducting experiments and laboratory programming time.

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

Week No.	Contents	ILOs covered by this topic
1	Metallic Materials: Processing-Crystal-imperfection	a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
2	Metallic Materials: Processing	a1-1,a2-1,a2-2 ,b1-1,c2-1,d2-1
3	Metallic Materials: Processing	a1-1,a2-1,b2-1,c1-1,c2-1,d2-1,d4-1
4	Metallic Materials: Processing	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1
5	Important metallic alloys	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
6	Important metallic alloys	a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
7	Important metallic alloys	a1-1,a2-1,a2-2 ,b2-1,c1-1,c2-1,d2-1,
8	Polymer materials	a1-1.a2-1,a2-2 ,b1-1,b2-1,d2-1,
9	Polymer materials	a1-1.a2-1,a2-2 ,b1-1 ,d2-1,
10	Composite materials	a1-1.a2-1,a2-2 ,c1-1,c2-1,d2-1,
11	Composite materials	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
12	Ceramic Materials Magnetic Materials	,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
13	Ceramic Materials Magnetic Materials	a1-1,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
14	Criteria for materials selection.	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
15	General revision	,a2-2 ,b1-1,b2-1,c1-1,c2-1,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,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,	a1-1,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,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,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,d4-1	a1-1,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,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):

J T. Black Auburn University-Emeritus Ronald A. Kohser *University of Missouri–Rolla*:MATERIALS AND PROCESSES INMANUFACTURING: 2008,tenth edition, *John Wiley & Sons, Inc*

Nikhilesh Chawla and Krishan K. Chawla "METAL MATRIX COMPOSITES" 2006 Springer Science+Business Media, Inc.

- Valery V. Vasiliev and Evgeny V. Morozov "MECHANICS AND ANALYSIS OF COMPOSITE MATERIALS" 2001 Elsevier Science Ltd.

13.3- Recommended books

Donald R. Askeland,Pradeep P. Fulay and Wendelin J. Wright "The Science and Engineering of Materials" Sixth Edition. USA,2006

- Bryan Harris, " ENGINEERING COMPOSITE MATERIALS" The Institute of Materials, London, 1999

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

Dr.Mohmmed Ashrf Saad

Head of Dept.
Prof. Taha El-Taweel

Date-- 19 March 2013

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Non-metallic Materials**
Course Code:	**PRE 502**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**1 / 3 / 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.**	**Diploma**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr .Hamdy nada**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

Introduction to Clay products, Heat insulators , Alomina , Silicon nitrides , Materials strengthened with fibers , Metals and ceramics Wood: Classification, properties and tests.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	35%	35%	10%	10%	100%

B.2. *Course Objectives:*

The aim of this course is to provide the student with means of learning the basics of non metallic materials. Also, this course gives the student with required skills basic of non metallic materials in engineering materials. This course will also provide students with the required skills of identifying, and solving the complicated problems in various engineering materials.

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	B1, B3	C1	D1

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice	a-1-1) Identify quantitative methods to solve stress analysis problems.
Intellectual skills	B-1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Able to formulate quantitative methods of analyzing production problems
	B-3) Read and analyze researches and topics related to the production engineering specialization	b-3-1) Apply production engineering technology in practice
Professional skills	C-1) Apply the professional production engineering technologies in the field of specialization.	c-1-1) Able to assess limitations of the available numerical methods.
General skills	D-1) Effectively communicates all kinds and sharing ideas with different relevant teams.	d-1-1)Apply knowledge of mathematics, science and production engineering concepts in practice.

B.5. *Syllabus to be Covered:*

Week No.	**Contents**	**ILOs covered by this topic**
1	Introduction to Clay products	a-1,b-1-1, b-3-1, c-1-1, d-1-1,
2	Heat insulators	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1,
3	Alumina ,	a-1-1, b-2-1, c-1-1, d-2-1,
4	Silicon nitrides	a-1-1, b-1-1, b-3-1, c-1-1, d-2-1.
5	Materials strengthened,	a-1-1, b-1-1, b-3-1, c-1-1, d-4-1.
6	Materials strengthened with fibers	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1,
7	Metals	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1, .
8	ceramics	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1, d-2-1,
9	Ceramic types	a-1-1, b-1-1, b-3-1, c-1-1, d-2-1,
10	Properties of ceramic	a-1-1, b-1-1, b-3-1, c-1-1, d-2-1,
11	Introduction to Woods	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1,
12	Classification of woods	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1,
13	Characterization of woods	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1, .
14	Application of woods	a-1-1, b-1-1, b-3-1, c-1-1, d-2-1,.

Week No.	Contents	ILOs covered by this topic
15	Tests of woods	a-1-1, b-1-1, b-3-1, c-1-1, d-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	Assignments and Exercises	a-1, b-1,b-3 , c-1,c-4,,d-1,	a-1, b-1,b-3, c-1,c-4,d-1 ,

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, b-1, b-2, c-1,c-	a-1, b-1, b-2, c-1,c-3, d-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-E. M. Mielnick, Metalworking Science and Engineering, McGraw–Hill, 1991.

Recommended books

1- G. E. Dieter, Mechanical Metallurgy, second ed., McGraw–Hill, 1976

Periodicals, Web sites, Course notes, etc:

1. http:// http://paniit.iitd.ac.in/~pmpandey.
2. G. J. Hildenman, M. J. Koczek: AGARD Lecture Series No. 174, New Light Alloys, September 1990.

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. hamdy nada

Head of Dept.

Prof. Taha El-Taweel

Date-- 15 NOVAMBER 2013

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

COURSE SPECIFICATION

Course Title:	Orthopedic Mechanics
Course Code:	PRE 503
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.	Diploma	
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:

This course will cover the application of basic mechanics to human movement. It will provide students with the basic understanding of how forces act on body segments and how movements are produced. The student should gain an understanding of the mechanical and anatomical principles that govern human motion and develop the ability to link the structure of the human body with its function from a mechanical perspective. It also has applications in medical settings, including rehabilitation and sports medicine.

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. Understand the bone structure.
2. Understand the basic principles of the kinesiology.
3. Stress analysis of the femur- Hip and knee joints
4. Gait analysis and assessment of disorders
5. Understand lubrication of articular joints
6. Understand spinal mechanics
7. Management of deformities and disorders

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, a4	b1, b2	c1,c2	d2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a1-1) Recognize the fundamental concepts and definitions of biomechanics and ergonomics that can be applied to practice. a1-2) Identify physical principles related to biomechanics of human health and diseases, which underpin physical therapy
	a4. Understand the moral and legal principles of professional practice in production engineering.	a4-1) Recall the biomechanical principles that emphasize the dynamic relationships of human structure and function
Intellectual skills	b2. Solve production engineering problems in the area of specialized career.	b2-1) Synthesize information from a number of sources of biomechanics in order to gain a coherent understanding of a clinical case
	b4. Assess the risks in professional production engineering practices.	b4-1) Extract data of biomechanics using information technology, library and appropriate techniques.
Professional skills	c1. Apply the professional production engineering technologies in the field of specialization.	c1-1) Apply the relevant biomechanical principles in evaluation of different clinical cases.
	c2. Write professional production engineering reports.	c2-1) Apply the biomechanical principles on demonstration of evidence based practice

Field	Programme ILOs that the course contribute in achieving	Course ILOs
General skills	d2. Use information technology to serve the development of production engineering professional practice.	d-2-1) Improve communication with the internet critically as a source of information about orthopedic biomechanics.

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

Week No.	Contents	ILOs covered by this topic
1	Introduction: General Knowledge .	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
2	Bone structure.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
3	Mechanical properties and their relevance.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
4	Evaluation of strength and mechanical properties.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
5	The basic principles of the kinesiology.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
6	Gait analysis and assessment of disorders.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
7	Stress analysis of the femur- Hip and knee joints.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
8	Stress analysis of the femur- Hip and knee joints.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
9	Effect of insertion of the prosthetic hip.	a-1-1, a-1-2, b-2-1,b-4-1, c-1-1,c-2-1, d-2-1,
10	Knee interamedullary stems.	a-1-1, a-1-2, b-2-1,b-4-1, c-1-1,c-2-1, d-2-1,
11	Lubrication of articular joints.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
12	Spinal mechanics.	a-1-1, a-1-2, b-2-1,b-4-1, c-1-1,c-2-1, d-2-1.
13	Spinal mechanics.	a-1-1, a-1-2, b-2-1,b-4-1, c-1-1,c-2-1, d-2-1,
14	Components properties characterization.	a-1-1, a-1-2, b-2-1, c-1-1,c-2-1, d-2-1.
15	Management of deformities and disorders.	a-1-1, a-1-2, b-2-1,b-4-1, c-1-1,c-2-1, 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-1-2, b-2-1, b-4-1, c-1-1,c-2-1, d-2-1, d-4-1.	a-1-1, a-1-2, b-2-1, b-4-1 c-1-1,c-2-1, 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-1-2, b-2-1, b-4-1, c-1-1,c-2-1, d-2-1,	a-1-1, a-1-2, b-2-1, b-4-1, c-1-1,c-2-1, 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. Simona MIHAI1,a, Viviana FILIP1,b; 1Valahia University of Targoviste, Romania;ASPECTS OF ORTHOPEDIC IMPLANTS AND PROSTHESES. MATERIALS. PROCESSING TECHNOLOGIES.The Scientific Bulletin of VALAHIA University – MATERIALS and MECHANICS – Nr. 7 (year 10) 2012.
2. McGinnis, P.M. (1999). "Biomechanics of Sport and Exercise. Champaign, IL: Human Kinetics "
3. S. J. Hall, *Basic Biomechanics, Fourth Edition*, McGraw Hill, New York, 2003.
4. N. Ozkaya, M. Nordin, *Fundamentals of Biomechanics, Second Edition*, Springer, New York, 1999.

Periodicals, Web sites, Course notes, etc:

1-.Gait Analysis**, VICON / Applications**

2- www.AuroraHealthCare.org**, Spine Safety and Body Mechanics**

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

- Lecture room with LCD or show for using power point presentations,
- Videos on various topics will be shown to the students,
- Self learning will be encouraged by active participation.

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:	**Composite Materials**
Course Code:	**PRE 504**
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**	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.**	Diploma	
5	**Pre-requisites course.**	None	
6	**Pre-requisites by Topic**	None	
7	**Coordinator**	Dr. Mohammed Ashraf Saad	
8	**External Evaluator(s)**	Prof.	

B- PROFESSIONAL INFORMATION:

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

Basics of composites- Types of binders- Rules for tailoring the properties - Polymer matrix composites : processing, tests – Ceramic matrix composites : processing and applications – Advanced composites – smart alloys

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 introduces students to composite materials in general and focuses on fibre reinforced polymer composite. The type of reinforcements, the types of matrices as well as others constituent are discussed in details. Students will also learn the manufacturing techniques of composite fabrications. The course will further explain the factors affecting the strength of composite and introduces some of the fundamental concepts of how to design successful composites materials component.

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, b2	c1,c2	d2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	a1. Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice..	a1-1 **Recognize** knowledge of mathematics, science and engineering concepts.
	a3. Know requirements for safe operation and conservation of the environment.	a2-1 **Demonstrate** understanding of structure and curing mechanisms of the matrix, includes unsaturated polyester resin, epoxy and vinyl ester resin. a2-2 **Identify** hazards and protections required when working with composites
Intellectual skills	b1. Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b1-1 **Design** the material selection methods such as cost vs. property analysis and weighted property comparison method
	b2. Solve production engineering problems in the area of specialized career. .	b2-1 **Employ** a suitable techniques to the discipline and understanding the best method for solving engineering problems
Professional skills	c1. Apply the professional production engineering technologies in the field of specialization.	c1-1 **Employ** a suitable techniques to the discipline and understanding the best method for solving engineering problems
	c2. Write professional production engineering reports	C2-**1** Write professional production engineering reports.
General skills	d2. Use information technology to serve the development of production engineering professional practice.	d2-1) **Balance** between laboratory facilities resources for conducting experiments and laboratory programming time.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Basics of composites- -—	a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,
2	Types of binders	a1-1,a2-1,a2-2 ,b1-1,c2-1,d2-1,
3	S Types of binders	a1-1,a2-1,b2-1,c1-1,c2-1,d2-1
4	Rules for tailoring the properties	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1
5	Rules for tailoring the properties	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1
6	Rules for tailoring the properties	a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1
7	Ceramic matrix composites : processing and applications	a1-1,a2-1,a2-2 ,b2-1,c1-1,c2-1,d2-1
8	Ceramic matrix composites : processing and applications	a1-1.a2-1,a2-2 ,b1-1,b2-1,d2-1
9	Ceramic matrix composites : processing and applications	a1-1.a2-1,a2-2 ,b1-1 ,d2-1,
10	Polymer matrix composites : processing, tests	a1-1.a2-1,a2-2 ,c1-1,c2-1,d2-1
11	Polymer matrix composites : processing, tests	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1
12	Polymer matrix composites : processing, tests	,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1,d4-1
13	Advanced composites – smart alloys	a1-1,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1
14	Advanced composites – smart alloys	a1-1.a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1
15	General revision	,a2-2 ,b1-1,b2-1,c1-1,c2-1,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,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1	a1-1,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,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,a2-2 ,b1-1,b2-1,c1-1,c2-1,d2-1	a1-1,a2-1,a2-2 ,b1-1,b2-1,c1-1,c2-1,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):

Nikhilesh Chawla and Krishan K. Chawla "METAL MATRIX COMPOSITES" 2006 Springer Science+Business Media, Inc.

- Valery V. Vasiliev and Evgeny V. Morozov "MECHANICS AND ANALYSIS OF COMPOSITE MATERIALS" 2001 Elsevier Science Ltd.

- S. T. Peters , "HANDBOOK OF COMPOSITES " 1998 Chapman & Hall.

13.3- Recommended books

- Bryan Harris, " ENGINEERING COMPOSITE MATERIALS" The Institute of Materials, London, 1999

- *K*arl Ulrich Kainer "Basics of Metal Matrix Composites"

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

Dr.Mohmmed Ashrf Saad

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:	Testing of Materials
Course Code:	PRE 505
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.	Diploma	
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:

This course will cover the application of mechanical testing which plays a major role in concurrent engineering through the measurement of properties of product design, as well as for deformation processing. New methods of measurement have evolved and such as strain measurement by vision systems and ultrasonic methods for measurement of elastic properties

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. Understand the basics of mechanical behavior of engineering materials and general engineering aspects of mechanical testing.
2. Understand the the basic simple loading types (tension, compression, bending, and shear) for deterimation of bulk properties of materials under quasi-static or dynamic conditions.
3. Understand the various methods for indentation testing, "Hardness Testing," which is a relatively inexpensive test of great importance in manufacturing quality control and materials science.

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	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.Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1-1) The mechanical properties for different materials and its importance for production engineering practice.
	a2.Understand the basics of quality in professional production engineering practice according to specialization.	a-2 -1) Static and dynamic tests to determine the bulk properties of materials which are the basics of quality in professional production engineering practice according to specialization.
Intellectual skills	b4.Assess the risks in professional production engineering practices.	b-4-1) The concept of design stress or the safe value for any property of any application.
	b5. Make career decisions in the light of available production engineering information.	b-5-1) Make career decisions in the light of available production engineering information.
rofessional skills	c1. Apply the professional production engineering technologies in the field of specialization.	c-1-1) Apply the professional production engineering technologies in the field of specialization.
	c2. Write professional production engineering reports.	c-2-1) Write professional production engineering reports.
General skills	d2. Use information technology to serve the development of production engineering professional practice.	d-2-1) Improve communication with the internet critically as a source of information about the discipline.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction:.Properties of materials	a-2-1, b-4-1, c-1-1,c-2-1, d-2-1,
2	Tension Test	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
3	Compression Test	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
4	Bending Test	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
5	Impact Tests	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
6	Hardness Tests	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
7	Creep Tests	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
8	Fatigue Tests	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
9	Fatigue Tests	a-1-1, a-2-1, b-4-1, c-1-1, d-2-1.
10	Two dimensional stress analysis.	a-1-1, a-2-1, b-4-1, b-5-1,c-2-1, d-2-1.
11	Mohr circle	a-1-1, a-2-1, b-4-1, b-5-1,c-2-1, d-2-1.
12	3-dimensional stress analysis	a-1-1, a-2-1, b-4-1, b-5-1,c-2-1, d-2-1.
13	Stress deviators, Mean stress	a-1-1, a-2-1, b-4-1, b-5-1,c-2-1, d-2-1.
14	Strain Analysis	a-1-1, a-2-1, b-4-1, b-5-1,c-2-1, d-2-1.
15	yielding theory and elasticity theories	a-1-1, a-2-1, b-4-1, b-5-1 c-1-1,c-2-1, 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-2-1, b-4-1, b-5-1 c-1-1,c-2-1, d-2-1,.	a-1-1, a-2-1, b-4-1, b-5-1 c-1-1,c-2-1, 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-2-1, b-4-1, b-5-1 c-1-1,c-2-1, d-2-1,.	a-1-1, a-2-1, b-4-1, b-5-1 c-1-1,c-2-1, 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. ASM International, *Mechanical Testing and Evaluation*, Volume 8, Copyright © (2000) under the direction of the ASM Handbook Committee.
2. David Roylance, MECHANICAL PROPERTIES OF MATERIALS, 2008
3. **J.R. Davis**, **Tensile Testing**, Copyright _ 2004 by ASM International.

Periodicals, Web sites, Course notes, etc:

1-. http://www.npl.co.uk/npl/cmmt/projects/tenstand/ **Tensile Testing of Metallic Materials: A Review**

2- Material Testing eBook, INSTRON

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

- Lecture room with LCD or show for using power point presentations,
- Videos on various topics will be shown to the students,
- Self learning will be encouraged by active participation.

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.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Powder Metallurgy**
Course Code:	**PRE 506**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**/ 2 / 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.**	**Diploma**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Mahmoud Samir El-wazery**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

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

Introduction to powder metallurgy (history and modern development), advantage, limitation and application, method of producing powder, processing sequence, pressing (cold isostatic and hot isostatic) and sintering.

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 aim of this course is to understand the differences between conventionally produced and powder metallurgy with respect to potential uses. This course will also discuss the advantages, disadvantages and the applications of produced by powder metallurgy. The course concentrates on powder metallurgy methods and steps of processing.

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	B1	C1,C2	D1

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice	a-1-1) Identify quantitative methods to solve stress analysis problems.
Intellectual skills	B-1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Able to formulate quantitative methods of analyzing production problems
Professional skills	C-1) Apply the professional production engineering technologies in the field of specialization.	c-1-1) Able to assess limitations of the available numerical methods.
	C-2)Write professional production engineering reports	c-2-1)Identify professional production engineering and mechanical design problems and propose solutions for them
General skills	D-1) Use information technology to serve the development of production engineering professional practice	d-2-1) Improve 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 powder metallurgy	a-1-1, b-1-1, b-2-1 c-1-1,c-2-1, d-2-1, .
2	Powder metallurgy development	a-1-1, b-1-1, b-2-1, c-1-1, c-2-1 d-2-1,.
3	Advantage, limitations and Potential applications	a-1-1, b-2-1, c-1-1,c-2-1, d-2-1
4	Characterization and testing of powder	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1, d-2-1.
5	Powder fabrication	a-1-1, b-1-1, b-2-1, c-1-1, c-2-1,
6	Main fabrication methods	a-1-1, b-1-1, b-2-1, c-1-1, c-2-1, d-2-1, d-1.
7	Processing sequence	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1, d-2-1,
8	Maching, grinding and filling	a-1-1, b-1-1, b-2-1, c-1-1, c-2-1 d-1-1.

Week No.	Contents	ILOs covered by this topic
9	Mixing and milling of powders	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1 d-1-1,.
10	Pressing of powder	a-1-1, b-1-1, b-2-1, c-1-1, d-2-.
11	Cold isostatic of powder	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1 d-1-1,
12	Hot isostatic of powder	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1, d-1-1.
13	Sintering of powder	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1, d-1-1.
14	Spark plasma Sintering	a-1-1, b-1-1, b-2-1, c-1-1, d-1-1.
15	Microwave Sintering	a-1-1, b-1-1, b-2-1, c-1-1,c-2-1, d-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, b-1, c-1,c-2, d-1	a-1, b-1, c-1,c-2, d-1

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, b-1, b-2, c-1, d-1	a-1, b-1, b-2, c-1, c-2 d-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-R.M. German: Powder Metallurgy Science
Princeton, New Jersey: American Powder Industries Federation, 198.
2- G. J. Hildenman, M. J. Koczek: AGARD Lecture Series No. 174, New Light Alloys, September 1990

Recommended books

1-F.V. Lenel: Powder Metallurgy Principles and Applications
Princeton, New Jersey: American Powder Industries Federation, 1980.
2- . Kumpfert, G. Staniek, W. Kleinekathöfer, M. Thumann: Mechanical Alloying of Elevated Temperature Al-Alloys Proc. ASM International Conference "Structural Applications of Mechanical Alloying", ed. by F. M. Froes, J. J. de Barbadello, ASM Int., Metals Park, Ohio 44037, 1990

.***Periodicals, Web sites, Course notes, etc:***

1. http://www.youtube.com/watch?v=n_FW7Q2xO5o&feature=related
2. http://www.globalspec.com.

3-V.S. Arunachalam, R. Sundaresan: Powder Metallurgy in: Materials Science and Technology (ad. R.W. Cahn, P. Haasen, E.J. Kramer), vol. 15 chap. 4, VCH, Weinheim, 1991.

4-ASM Metals Handbook: Powder Metallurgy, Vol. 7, 9th ed. American Society for Metals, Metals Park Ohio 44073, 1984.

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. Mahmoud Samir El-wazery

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2013

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	***Forming technology***
Course Code:	***PRE 507***
Department Offering the Course:	**Production Engineering & 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 & Mechanical Design**	
4	**Level at which this course is offered.**	*diploma*	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Ahmed El- Sissy**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

Classification of forming processes- Basics of plastic forming- Temperature effects-Metallurgical variations- formability-Rolling- Rod and wire drawing - Sheet forming - Forging

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 statistics to test the validity of a hypothesis. Targets includes, but not limited to:

1. Demonstration of the knowledge and understanding the basic conceptes of forming technology.
2. Definition of the requirements of metal forming technology.

3. Realizing the difference between different forming processes.
4. Analysis of different techniques for manufacuring different products based on material and process selection criteria.
5. Analysis of different techniques for modeling the forming processes.
6. Work with mechanical design and manufacturing 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, a4	b1, b5	c1,c2	D1

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a1.1. Define the basic concepts of forming technology and their applications in production
	a4. Understand the moral and legal principles of professional practice in production engineering	a4.1. Identify and analyze the different trouble causes to take the required corrective action.
Intellectual skills	b1. Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b.1.1. Design and Create the most suitable manufacturing flow chart to select the suitable design of a product based on different criteria of the material and the forming process for solving engineering problems ..
	b5. Make career decisions in the light of available production engineering information.	b.5.1. Create criteria suitable for selecting the best material, process and product design and redesign throughout chart of the final product.
Professional skills	c1. Apply the professional production engineering technologies in the field of specialization.	c.1.1. use the professional production engineering technologies related to engineering material and forming processes using design and feedback of the design to improve products.
	c2. Write professional production engineering reports.	c.2.1. Write and evaluate professional reports about production engineering.
General skills	D1. Use of different sources for information knowledge	d.1.1. Share the students to use different sources for information knowledge

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Classification of forming processes.	b1.1, b5.1, c1.1,c2.1,
2	Plastic forming and temperature effects	a1.1, b1.1, b5.1, c1.1,c2.1
3	Plastic forming and temperature effects	a1.1, b5.1, c1.1,c2.1,
4	Plastic forming and temperature effects	a1.1, a4.1, b1.1, b5.1, c1.1,c2.1,
5	Metallurgical variations and formability	a1.1, a4.1, b1.1, b5.1, c1.1,
6	Metallurgical variations and formability	a1.1, a4.1, b1.1, b5.1, c1.1,
7	Metallurgical variations and formability	a1.1, , b5.1, c1.1,c2.1,
8	Bulk forming of metals	a1.1, b5.1, c1.1,c2.1,
9	Metallurgical variations and formability	a1.1, a4.1, b1.1, b5.1, c2.1,
10	Rolling and drawing of rod and wire	a4.1, b1.1, b5.1, c1.1,d7.1
11	Rolling and drawing of rod and wire.	a1.1, a4.1, b1.1, b5.1, c1.1
12	Rolling and drawing of rod and wire	a1.1, a4.1, b1.1, b5.1,
13	Sheet forming-forging	a1.1, b1.1, b5.1, c1.1,c2.1,
14	Sheet forming-forging	a1.1, a4.1, c1.1,c2.1,
15	Sheet forming-forging.	a4.1, b1.1, b5.1,

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, a4, b1, b5, c1,c2**,** d1	a1, a4, b1, b5, c1,c2**,** 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, a4, b1, b5, c1,c2**,** d1	a1, a4, b1, b5, c1,c2**,** d1

Weighting of assessments:

B.8. *List of References:*

Essential books (text books):

-W.F.Hasford,R.M.Caddeell,Metal Forming,Mechanics,Metallurgy.2nd ed.prenhi Hall.
-S. Kalpakjian and S.R. Schmid, "Manufacturing Engineering and technology" 4th Edition Pearson Education Inc., 2010.

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. Computers with MS Office (Excel) and SPSS or any other statistical package for social statistics.
2. A lecture room with LCD or show

Course coordinator

Prof. Dr. Ahmed El- Sissy

Head of Dept.

Prof. 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:	**Stress analysis**
Course Code:	**PRE 508**
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.**	**Diploma**	
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 stress and strain, Static and dynamic stresses, Behavior of different materials under variable stresses, Thermal stresses, Thermal cycling, Impact stresses

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 aim 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 identifying the critical section in engineering problems. 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	B1, B2	C1	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice	a-1-1) Identify quantitative methods to solve stress analysis problems.
Intellectual skills	B-1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Able to formulate quantitative methods of analyzing production problems
	B-2) Solve production engineering problems in the area of specialized career	b-2-1) Able to quantify predicted results, and assess impacts using mathematical methods and models
Professional skills	C-1) Apply the professional production engineering technologies in the field of specialization.	c-1-1) Able to assess limitations of the available numerical methods.
General skills	D-2) Use information technology to serve the development of production engineering professional practice	d-2-1) Improve information technology tools related to specific production engineering discipline.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Definition of boundary value problem	b-1-1, c-1-1, d-2-1
2	Stress analysis	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1
3	Definition of different type of strain	a-1-1, b-2-1, c-1-1, d-2-1,.
4	Strain analysis	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1.
5	Definition of material constants	a-1-1, b-1-1, b-2-1, c-1-1,.
6	Stress-strain relations and failure theories	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1
7	Solution methods of elastic problems	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1
8	Solution of plane problems in Cartesian coordinate	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1
9	Solution of plane problems in Cartesian coordinate	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1
10	Stress analysis of thick-walled cylinders.	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1
11	Stress analysis of rotating disc, drums and turbines.	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1
12	Stress analysis of axially non-symmetric problems	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1,
13	Bending of rods	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1,
14	Bending of rods	a-1-1, b-1-1, b-2-1, c-1-1, d-2-1,
15	Impact stresses	a-1-1, b-1-1, b-2-1, c-1-1, d-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	Assignments and Exercises	a-1, b-1, b-2, c-1, d-2,	a-1, b-1, b-2, c-1, 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, b-1, b-2, c-1, d-2,	a-1, b-1, b-2, c-1, 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):

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

13.3- Recommended books

.

Periodicals, Web sites, Course notes, etc:

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

Prof. Mahmoud Abo-Elkier

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2012

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

COURSE SPECIFICATION

Course Title:	***METOLOGY***
Course Code:	***PRE 509***
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.)***	Diploma in Production Engineering and Mechanical Design
4	***Level at which this course is offered.***	Level 500
5	***Pre-requisites course.***	Metrology & Calibration ,Mechanical Measurements.
6	***Pre-requisites by Topic***	Design of Instruments-Metrology of Machine Tools.
7	***Coordinator***	Prof. Dr. Ahmed Mahmoud Easa
8	***External Evaluator(s)***	Prof. Dr……

B- PROFESSIONAL INFORMATION:

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

The international standard systems and standardization – ISO 9000,------, and 9004 – Applications of ISO Applications of ISO 14000 – Using interferometer in the measurements. Miscellaneous measurements – Basics of instruments and measuring tools design- Metrology of machine tool.

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 the treatment with International standard and standardization of ISO in measuring instruments and measuring systems. Targets also includes, but not limited to:

1. Design the instruments due to International standards ,
2. Be able to conduct quantitative research through application of advanced measuring methods and collect results and analyze these results; and

3.Have hands for design the tools and instruments of different measurements.

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, 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) Integrate theories, fundamentals and knowledge of information technology in measuring practice errors.
	A-2) Identify professional production engineering and mechanical design problems and propose solutions for them.	a-2-1) Understand the basics of quality in professional production engineering practice according to specialization.
Intellectual skills	B-1) Identify and analyze problems in the area of advanced methods of measurements.	b-1-1) Able to use standard methods for design the tools and instruments of measurements.
	B-4) Assess the risks in professional production engineering practices.	b-4-1) Create the desired software dealing with the used methods for modeling and analyzing measurement problems.
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 production engineering reports.	c-2-1) Write and evaluate professional reports in the field of measuring results.
General skills	d1. Effectively communicate all kinds and sharing ideas with different relevant teams.	d.1.1. Share the students to design questionnaires that collect data efficiently.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1.	International standard system and standardization.	a-1-1, b-1-1, b-1-1
2.	Applications of suitable ISO on some types of M/C tools.	a-1-1, b-1-1, b-4-1, c-2-1
3.	Using interferometer in measurements.	a-1-1, , b-1-1, b-4-1, c-2-1
4.	General introduction to Miscellaneous measurements.	a-1-1, a-2-1, b-1-1, b-5-1, c-1-1, c-2-1, d-2-1
5.	Measuring some of complex shapes.	a-1-1, a-2-1, b-1-1, b-4-1,b-5-1, c-2-1
6.	Using(Sensors , transducers). in measurements.	a-2-1,b-4-1, b-5-1, c-2-1, d-2-1
7.	Using(strain gauge) in measurements.	a-2-1,b-4-1, b-5-1, c-2-1, d-2-1
8.	General introduction to Basics of instruments and measuring tool design.	a-1-1, a-2-1, b-1-1, b-5-1, c-1-1, c-2-1, d-2-1
9.	Design concepts of instruments and measuring tool design	a-1-1, a-3-1, b-1-1, b-5-1, c-1-1,c-2-1
10.	General introduction to the metrology of machine tools .	a-1-1, a-2-1, b-1-1, b-5-1, c-1-1, c-2-1, d-2-1
11.	Axis location errors and measurement.	a-2-1,b-4-1, b-5-1, c-2-1, d-2-1
12.	Component errors of linear axes (position, straightness,) and measurement.	a-1-1,b-1-1,b-4-1, b-5-1, c-2-1, , d-2-1,
13.	Component errors of linear axes (pitch and roll errors) and measurement.	a-1-1,b-1-1,b-4-1, b-5-1, c-2-1, , d-2-1,
14.	Compensation of errors: error propagation, decoupled method……..etc.	a-1-1,b-1-1,b-4-1, b-5-1, c-2-1, , d-2-1,
15.	Applications on some types of machines.	a-1-1,a-2-1, b-1-1,b-4-1,b-5-1, c-2-1, , d-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,b-5, 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, b-5, c-1, c-2, d-2	a-1, a-2, b-1,b-4, 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.ISO/TS 14253-2:1999: Geometrical Product Specifications (GPS) -- Inspection by measurement of workpieces and measuring equipment -- Part 2: Guide to the estimation of uncertainty in GPS measurement, in calibration of measuring equipment and in product verification.

4.S.D. Phillips, B.R. Borchardt, and G. Caskey, Measurement Uncertainty Considerations for Coordinate Measuring Machines, NIST Report 5170 (1993).

Periodicals, Web sites, Course notes, etc:

- ***ANSI/NCSL Z540-2-1997,* Guide to the Estimation of Uncertainty in Measurement. *(GUM).***

-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 (i.e.; classrooms, metrology and computer laboratories,.etc.).

1. Classroom.

2. Data show.

Course coordinator

Prof. Dr. Ahmed M. Easa.

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:	***Jigs and fixtures***
Course Code:	***PRE 510***
Department Offering the Course:	**Production Engineering & 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 & 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 Hewedi**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

Basic general design – Design procedures – Principles of location and clamping and their types – Indexing – Standard elements – milling – turning – broaching - ….) – Manufacturing and economy of jigs and fixtures.

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 statistics to test the validity of a hypothesis. Targets includes, but not limited to:

1. Demonstration of the knowledge and understanding the basic concepts of jigs and fixtures design
2. Definition of the requirements of jigs and fixtures tools .
3. Realizing of the different types of jigs and fixtures suitable for different machining operations.
4. Understand terminology used in jigs and fixtures design

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	a3, a4	b1, b5	c1,c2	d1

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a3. Know requirements for safe operation and conservation of the environment.	a.3.1. Define the basic concepts of jigs and fixtures and their applications on mass production
	a4. Understand the moral and legal principles of professional practice in production engineering.	a4.1. Identify and analyze the different trouble causes on process to take the required corrective action.
Intellectual skills	b1. Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b.1.1. Create solutions for various engineering topics related to jigs and fixtures for machine tools to reduce mass production cost and time.
	b5. Make career decisions in the light of available production engineering information..	b5.1.Formulate and create suitable solutions to represent the best design of jigs and fixtures taking in consideration cost , time, quality and industrial safety of production process
Professional skills	c1. Apply the professional production engineering technologies in the field of specialization.	c.1.1. Demonstrate some suitable solutions to reduce cost of products by applying professional production engineering technologies . .
	c2. Write professional production engineering reports.	c.2.1. Write and evaluate professional reports about novel points

Field	Programme ILOs that the course contribute in achieving	Course ILOs
General skills	d1. Effectively communicate all kinds and sharing ideas with different relevant teams.	d.1.1. Share the students to design questionnaires that collect data efficiently.

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

Week No.	Contents	ILOs covered by this topic
1	Introduction to jigs and fixtures design	a3.1, a4.1**,** c1.1,c2.1**,** d1.1,
2	Basic general design and design procedures	a3.1, a4.1**,** b1.1, b5.1**,** c1.1
3	Basic general design and design procedures	a3.1, b1.1, b5.1**,** c1.1,
4	Basic general design and design procedures	b1.1, b5.1**,** c1.1,c2.1**,** d1.1,
5	Principles of location and clamping and their types	a3.1, b1.1, b5.1**,** c1.1,c2.1**,**
6	Principles of location and clamping and their types	a3.1, a4.1**,** b5.1**,** c2.1**,** d1.1,
7	Principles of location and clamping and their types	a3.1, a4.1**,** b5.1**,** c1.1,c2.1**,**
8	Indexing and standard elements	b5.1**,** c1.1,c2.1**,** d1.1,
9	Indexing and standard elements	a3.1, a4.1**,** b1.1, b5.1**,** c1.1,c2.1**,**
10	Indexing and standard elements	a3.1, a4.1**,** b1.1, d1.1,
11	Applications of jigs and fixtures on different machining processes such as milling	a3.1, a4.1**,** b1.1, b5.1**,** c1.1,c2.1**,** d1.1, d4.1
12	Applications of jigs and fixtures on different machining processes such as milling	a3.1, a4.1**,** b1.1, c1.1,c2.1**,** d1.1,
13	Applications of jigs and fixtures on different machining processes such as milling	a3.1, b5.1**,** c1.1,c2.1**,** d1.1,
14	Manufacturing and economy of jigs and fixtures	a3.1, a4.1**,** b1.1, b5.1**,**
15	Manufacturing and economy of jigs and fixtures	a3.1, a4.1**,** b1.1, b5.1

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	a3, a4**,** b1, b5**,** c1,c2**,** d1,	a3, a4**,** b1, b5**,** c1,c2**,** d1,

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a3, a4**,** b1, b5**,** c1,c2**,** d1	a3, a4**,** b1, b5**,** c1,c2**,** 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):

-P H Joshi, " Machine Tools Hand book Design and Operation", Copyright C, 2007,Tata MacGraw Hill Publishing Company Limited

.

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. Computers with MS Office (Excel) and SPSS or any other statistical package for social statistics.
2. A lecture room with LCD or show

Course coordinator

Prof. Dr. Mahmoud Hewedi

Head of Dept.

Prof. Taha 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:	**Cutting Tool Design**
Course Code:	**PRE 511**
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**	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.**	Diploma - 500	
5	**Pre-requisites course.**	None	
6	**Pre-requisites by Topic**	None	
7	**Coordinator**	Dr. Ali Elmasry	
8	**External Evaluator(s)**	Prof.	

B- PROFESSIONAL INFORMATION:

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

Metal and nonmetal tool materials – Design of cutting tools – Gear cutting tools – Design and manufacturing of form cutting tools – Special engineering tools – Dies for mass production – Economical considerations.

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 students with a means of analysis and how to determine the proper manufacture of a material to design tools used in engineering applications. As well, and this course is to provide students with the necessary skills to design a tools used in gear cutting, as well as special cutting tools. This is of course

also provide students with the necessary skills to identify and manufacture of production molds quantification. With this in mind the economy.

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	B1, B3	C1, C2	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A-1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1-1) Recognize quantitative methods to solve cutting tool design problems.
	A-3) Know requirements for safe operation and conservation of the environment.	a-3-1) Identify metal and nonmetal tool materials bases to used production engineering applications
Intellectual skills	B-1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Apply production engineering technology in design of cutting tools.
	B-3) Read and analyze researches and topics related to the production engineering specialization.	b-3-1) Able to quantify gear cutting tools predicted results, and assess impacts using mathematical methods and models.
Professional skills	C-1) Apply the professional production engineering technologies in the field of specialization.	c-1-1) Apply the professional production engineering technologies in the design and manufacturing of form cutting tools.
	C-2) Write professional production engineering reports.	c-2-1) Communicate and manage the team work within the special engineering tools.
General skills	D-2) Use information technology to serve the development of production engineering professional practice.	d-2-1) Employ the available resources efficiently to design the dies for mass production.

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

Week No.	Contents	ILOs covered by this topic
1	Cutting tool materials	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, .
2	Cutting tool technology and learning design	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, .
3	Design of cutting tools for turning	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, .
4	Design of cutting tools for drilling	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
5	Gear cutting tools	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
6	Design and manufacturing of form cutting tools	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
7	Systems of length, area, and force measurement	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
8	Dies design of forming	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, .
9	Dies design of bending, extrusion and deep drawing	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
10	Design of compound dies	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,.
11	Simple die punching	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
12	Die-cutting operations	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
13	Tool design for inspection and gaging	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,.
14	Numerical methods in design	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
15	Economic considerations of design	a-1-1, a-3-1, b-1-1, b-3-1, c-1-1, c-2-1, d-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	Assignments and Exercises	a-1, a-3, b-1, b-3, c-1, c-2, d-2,	a-1, a-3, b-1, b-3, 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-3, c-1, c-2, d-2,	a-1, a-3, b-1, b-3, 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):

Advanced Machining: The Handbook of Cutting Technology (1989) " Cutting Tool Technology Industrial Handbook", Graham T. Smith, eStudio Calamar S.L., Girona, Spain, ISBN-13: 9781848002043, Library of Congress Control Number: 2008930567 © Springer-Verlag London Limited 2008.

13.3- Recommended books

"Fundamentals of Tool Design", Fifth Edition, David Spitler, Jeff Lantrip, John G. Nee, CMfgE, David A. Smith, Copyright © 2003 Society of Manufacturing Engineers, 987654321

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

Dr. Ali Elmasry

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 19 November 2013

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

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Die Manufacture**
Course Code:	**PRE 512**
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:*

Design of die for rolling, extrusion- wire drawing- technical consideration, technaical for mould manufacture, shear stress, study of die live-modern die manufacturing, dimension and correction-calculation of wear clearance.

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 die design. As well as, this course provide the student with required skills of design, quality control of dies 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, 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 die design.
	A2) Know the exchangeable effect among the machine design practices and reflection on the environment.	a2-1) Describe the exchangeable effect among using special die design 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 die design in engineering.
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 die design 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 modern die manufacturing through the application of specific applied mechanics discipline knowledge.
	B3) Deal with different and contradicting knowledge to solve the problems.	b3-1) Design dies dealing with different and contradicting knowledge.
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 modern die design problems.
	C2) Write technical reports.	c2-1) Write technical reports about modern die manufacturing.
	C3) Evaluate the available methods and tools in the applied mechanics field.	c3-1) Evaluate the available different methods for solving the mechanisms problems.
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	Design of die for wire drawing	a1-1, a2-1, b1-1, d1-1
2	Technical consideration	a1-1, a3-1, d1-1
3	Technique for mould manufacturing	a1-1, a3-1, c1-1, c2-1,
4	Study of die life	a1-1, a2-1, b1-1
5	Modern die manufacturing	a1-1, c3-1, c4-1,
6	Dimensions and correction	b1-1, b2-1, b1-1, b2-1
7	Calculation of wear clearance	b2-1, b3-1, c1-1, c2-1,
8	Die set design	c1-1, c2-1, c3-1
9	Die block design	a1-1, a2-1, c1-1, c2-1,
10	Organization of stamping plants	a2-1, a4-1, d1-1
11	Design ,layout and quality assurance through quality control	b3-1, b2-1, c2-1, c3-1,
12	Design of die for wire drawing	b1-1, b3-1, d1-1
13	Technical consideration	c1-1, d1-1
14	Technique for mould manufacturing	b1-1, b4-1, c1-1, c3-1,
15	Study of die life	b3-1, b2-1, c2-1,

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, b1-1, b2-1, b3-1, b4-1, c1-1, c2-1, c3-1, d1-1,	A1, A2, A3, B1, B2 ,B3, C1, C2, C3, 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, b1-1, b2-1, b3-1, c1-1, c2-1, c3-1, c4-1, d1-1,	A1, A2, A3, B1, B2 ,B3, C1, C2, C3, 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):

1- metal forming processes , G.R NAGPAL - 2011
2- fundamentals of tool design , FRANK W. WILSON - new delhi - 1979

Recommended books

- tool design , DONALDSON, LECAIN, GOOLD – TATA McGRAW-HILL PUBLISHING COMPANY LTD - new delhi
- Design of extriosn, Milivojen M.Kostic,Depratment of Mechanicl Engineering.

Periodicals, Web sites, Course notes, etc:

- http:// www.alibaba Comp.

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

Dr/ **Salah Asseala**

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:	**Mechanical Vibrations**
Course Code:	**PRE 513**
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.**	**Diploma**	
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 Newton's second law of motion (Equation of motion). Introduction to the vibration of Single and two degree of freedom 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 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 of various mechanical systems and formulate mathematical models of problems in vibrations. This course will also provide students with the ability to select and design the appropriate isolation , absorption, and control system of vibration for the application of various mechanical systems. The skill of experimental

measurement of vibration monitoring for different mechanical system configurations is also provided. 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,A2	B1,B2	C1,C2	D1,D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A1- Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1 Describe the principle of the dynamics of the schemes that are used for mechanical vibrations.
	A2. Understand the basics of quality in professional production engineering practice according to specialization.	a-2 Define the appropriate isolation , absorption, and control system of vibration for the application of various mechanical systems
Intellectual skills	B1- Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-13 Select the suitable modeling scheme for different mechanical system configurations based on analysis.
	B2- Solve production engineering problems in the area of specialized career.	b-2-1 Evaluate the natural frequencies of single D.O.F systems. b-2-2 Compute the natural frequencies and mode shapes of Multi D.O.F. systems.
Professional skills	C1- Apply the professional production engineering technologies in the field of specialization.	c-1 Solve differential equations of motion to obtain the response.
	C2- Write professional production engineering reports.	c-2 Identify between the vibration measuring instruments and analyze the results.
General skills	D1- Effectively communicate all kinds and sharing ideas with different relevant teams.	d-1 Judge the created soft-ware by working team.
	D2- Self-assessment to identify personal learning needs.	d-2 Search for dynamical information and engage in life-long self learning.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	- Basic concepts of vibrations. - Classification if vibrations.	a1&a2
2	-Vibration Analysis procedure. - Spring , mass, damping elements.	a1&a2
3	- Equation of motion of Single D.O.F systems using: - Newton' s second law of motion, - Lagrange' equation.	a1&b2-1
4	Response for free vibrations (undamped and viscously damped),	c1
5	Response for forced vibrations (undamped and viscously damped) due to harmonic excitations and harmonic motion of the base	c1
6	- Vibration Isolation and control. - Whirling of rotating shafts.	c2
7	- Vibration measuring instruments	c2&d1
8	- Equations of motion of Multi D.O.F systems using: - Newton' s second law of motion,	b1 & b2-2
9	- Equations of motion of Multi D.O.F systems using: - Lagrange' equation.	b1 & b2-2
10	Natural frequencies and mode shapes (Eigen values and eigenvectors),	b2-2
11	Response for undamped free vibrations	c1
12	- Response for undamped forced vibrations due to harmonic excitations and harmonic motion of the base. - Dynamic absorber (undamped – damped).	c1
13	Vibration of one dimensional Continuous systems. - Longitudinal vibration of rods.	a1& c2
14	- Torional vibration of rods, - Flexural vibration of beams.	b1&c1
15	Approximate methods for the eigensolution: - Matrix iterative method, - Rayleigh's method	b1&c1& d2

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,	a-1, a-3, b-2, b-5,, c-3, c-4, 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-3, c-4, d-2,	a-1, a-3, b-2, b-5,, c-3, 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):

- Recommended books

1- **Mechanical Vibrations.4th Edition book, by Singiresu S.Rao, Prentice Hall, 2004**
2- **Fundamentals of Mechanical Vibration. 2nd Edition book, by S.G.Kelly, McGraw-Hill, 2002.**

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:	**Robotics**
Course Code:	**PRE 514**
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.**	**Diploma**	
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 Kinematics and Dynamics of Open kinematic chains.

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 of various robotic systems and formulate mathematical models of problems in kinematics of robot manipulator and planar serial robot. This course will also provide students with the ability to improve the performance of the manipulator and to simulate the dynamic behavior by constructing more accurate model of a robot.

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	A2,A3,A4	B2,B5	C1,C2	D1,D6

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A2. Understand the basics of quality in professional production engineering practice according to specialization.	a-2 Recognize the main elements of a robot manipulator.
	A3. Know requirements for safe operation and conservation of the environment.	a-3 Identify the different types of industrial robots.
	A4. Understand the moral and legal principles of professional practice in production engineering.	a-4 Select the suitable control and computer techniques for different robotic systems.
Intellectual skills	B2. Solve production engineering problems in the area of specialized career.	b-2 Evaluate the resulting joint moments actuating on a revolute joints of robots.
	B5. Make career decisions in the light of available production engineering information.	b-5 Apply the principles of mechanics for mathematical modeling, and analysis of robot manipulators.
Professional skills	C1. Apply the professional production engineering technologies in the field of specialization.	c-1 Employ a suitable techniques and software packages pertaining to the discipline and develop required computer programs.
	C2. Write professional production engineering reports.	c-2 Solve the direct and inverse kinematics of planar serial robot.
General skills	D1- Effectively communicate all kinds and sharing ideas with different relevant teams.	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 Robotics: - Basic Technical terms. - Major parts of robot.	a3 &a2
2	- Kinematics and dynamics of robots. - Classification of Robotic systems and applications.	a4 &a2
3	- Kinematics of Robot Manipulator. - Basic concepts of Kinematics. - Coordinate Frames. - Transformation of vectors.(rotation and translation)	b2&a4
4	- Denavit-Hartenberg Notation. - kinematic Relationship between Adjacent Links. -Manipulator Transformation Matrix.	c1&b5
5	- Velocity Propagation along links. - Manipulator Jacobian. - Kinematic analysis of end-effector.	c2
6	- Application on planar serial robot. - Inverse Kinematics Problems.	c1
7	- Applicability problems.	c2&d1
8	- Dynamic of robot manipulator.	a3 &a2
9	- Manipulator Dynamic Formulation.	a4 &a2
10	- Mathematical modeling of Robot Manipulator. – Equations of motion of serial planar robot with flexible joint.	b2 &b5
11	- Dynamic analysis of serial planar robot (Assembly Techniques). - The resulting joint moments actuating on a revolute joints.	b2&a4
12	- Industrial Robot with applications. - Characteristics of industrial manipulator in various domains.	c1&b5
13	- Kinematics and dynamics of industrial robot. - Eigen analysis of a semi elastic robot manipulator using condensation techniques.	c2
14	- Robotic Sensors and Vision. - the meaning of sensing. - sensors in robotics.	c1
15	- Kinds of sensors used in Robotics. - Industrial applications of vision- Controlled Robotic Systems.	c2&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	a-1, a-3, b-2, b-5,, c-3, c-4, d-1,	a-1, a-3, b-2, b-5,, c-3, c-4, d-1

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-3, c-4, d-1,	a-1, a-3, b-2, b-5,, c-3, c-4, d-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- . **J. J. Craig , Introduction to Robotics: Mechanics and Control , 2nd edition, Addison-Wesley, 1989.**
2- **R.P. Paul, Robot Manipulators : Mathematical, Programming and Control, MIT Press, Cambridge , 1981.**
3- **R K Mittal and I J Nagrath, Robotics and Control, McGraw-Hill, New Delhi, 2005**

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:	**Design of Mechanical Systems**
Course Code:	**PRE 515**
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.**	**Level 500**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Mohamed ASY**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

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

Design flow Diagram - Design needs- Specifications and requirements- Feasibility study - Creative design synthesis - preliminary design and developments - Detailed design - Prototype building and testing design for production - product release - Design analysis - Factor of safety – Reliability – Cost – Safety - Design project - 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 provide the student with means of design and analyzing the mechanical systems. As well as, this course provide the student with required skills of detecting the design principles of mechanical systems. The course will also provide students with the required skills of identifying the design methods of mechanical systems.

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, 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 design engineering technologies	a-1-1) Use quantitative methods to solve mechanical design problems.
	A-3 Know the scientific developments in the mechanical design engineering	a-2-1) Prove the ability to use design means to analyze mechanical systems.
Intellectual skills	B-2) Produce solutions to problems through the application of specific design engineering discipline knowledge based on limited and possible information.	b-2-1) Able to use quantitative methods of identifying the design of mechanical systems.
	B-5) Evaluate the risks in the design of specific mechanical engineering system.	b-5-1) Able to quantify predicted results, and assess impacts using mechanical design means.
Professional skills	C-3) Evaluate the available methods and tools in the mechanical design 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 mechanical design discipline.	d-2-1) Apply information technology tools related to specific mechanical design discipline.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Design flow Diagram	a-1-1, a-3-1, b-2-1, c-3-1,c-4-1, d-2-1.
2	Design needs	a-1-1, b-2-1, b-5-1, c-3-1, d-2-1
3	Specifications and requirements	a-3-1, b-2-1, b-5-1, c-3-1,c-4-1, d-2-1.
4	Feasibility study	a-1-1, a-2-1, b-2-1, c-3-1,c-4-1, d-2-1.
5	Creative design synthesis	a-1-1, a-2-1, b-2-1, c-3-1,c-4-1, d-2-1,
6	preliminary design and developments	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
7	Detailed design	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
8& 9	Prototype building and testing design for production	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
10	product release	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
11	Design analysis	a-1-1, a-2-1, b-3-1,c-6-1, d-2-1.
12	Factor of safety - Reliability – Cost	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1, d-2-1, d-4-
13	Safety	a-1-1, a-2-1, b-5-1, c-3-1,c-6-1, d-2-1
14	Design project	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,	a-1, a-3, b-2, b-5,, c-3, c-4, 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-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):

" Mechanical Systems Design Handbook", H osita D. I. Nwokah
Yildirim Hurmuzlu , CRC 2002 .

13.3- Recommended books

1- " Advanced Design of Mechanical Systems", Jorge A.C. Ambresio, Printed in Italy 2009

Periodicals, Web sites, Course notes, etc:

1. ASME, Journal of Mechanical Design.
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

DR. Mohamed ASY

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 March 2013

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Machine tool design**
Course Code:	***PRE 516***
Department Offering the Course:	**Production Engineering & 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 & Mechanical Design**	
4	**Level at which this course is offered.**	*diploma*	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Dr. Mohamed Nasser** **Dr Mohamed Asy**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

Introduction, force analysis, frames, gearboxes (speed and feed), spindle units, and slideways.

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 statistics to test the validity of a hypothesis. Targets includes, but not limited to:

1. Demonstration of the knowledge and understanding the basic concepts of machine tools design.
2. Definition of the requirements of machine tool design consideration.
3. Realizing the difference between different machine tools elements.
4. Analysis of different machine tools structures based on material, dimension and process selection criteria.
5. Analysis of different techniques for modeling the machine tools structures.
6. Work with production engineering and manufacturing 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, a4	b1, b5	c1,c2	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Integrate theories, fundamentals and knowledge of mathematics, science and information technology in machine tools design practice.	a1.1. Define the basic concepts of machine tools design and their applications in production technology.
	a4. Understand the moral and legal principles of professional practice in machine tools design.	a4.1. Identify and analyze the different trouble causes to take the required corrective action.
Intellectual skills	b1. Identify and analyze problems in the area of machine tools design specialization and rank the results according to their priorities.	b.1.1. Design and Create the most suitable design flow chart to select the suitable design of a machine tools components based on different criteria of the material and dimensions for solving design problems ..
	b5. Make career decisions in the light of available mechanical design information.	b.5.1. Create criteria suitable for selecting the best material, process and product design and redesign throughout chart of the final product.
Professional skills	c1. Apply the professional design considerations in the field of specialization.	c.1.1. use the professional design considerations related to machine tools design using design software tools to improve the design elements.
	c2. Write professional production engineering reports.	c.2.1. Write and evaluate professional reports about machine tools design.
General skills	D2. Use of different sources for information knowledge	d.2.1. Share the students to use different sources for information knowledge

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction	b1.1, b5.1, c1.1,c2.1,
2-3	Force analysis	a1.1, b1.1, b5.1, c1.1,c2.1
4-5	Frames	a1.1, b5.1, c1.1,c2.1,
6-9	Gearboxes (speed and feed)	a1.1, a4.1, b1.1, b5.1, c1.1,c2.1
10-12	Spindle Units	a1.1, a4.1, b1.1, b5.1, c1.1, d4.1,d
13-15	Slideways	a1.1, a4.1, b1.1, b5.1, c1.1, d4.1,

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, a4, b1, b5, c1,c2**,**	a1, a4, b1, b5, c1,c2**,**

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1, a4, b1, b5, c1,c2**,** d2	a1, a4, b1, b5, c1,c2**,** d2

Weighting of assessments:

B.8. *List of References:*

Essential books (text books):

- Koenigisberger, F., and Tlusty, Machine Tool Structures, Vol. I , Pergamon Press, Oxford,1983.
- Mehta, N.K., Machine Tool Design, Tata Mc Graw-Hill, New Delhi, 1984.
- P H Joshi, Machine Tools Handbook, Design and Operation,Tata Mc Graw-Hill, 2007.

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. Computers with MS Office (Excel) and SPSS or any other statistical package for social statistics.
2. A lecture room with data show

Course coordinator

Prof. Dr. Mohamed Nasser
Dr Mohamed Asy

Head of Dept.

Prof. Taha 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:	**Theory Of Machines**
Course Code:	**PRE 517**
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 hrs
2	**Exam. Hours**	3 hrs
3	**Contact Hours**	Lecture: 3 hrs/week | Lab: - -
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 and Dr.R. Abou-elnasr
8	**External Evaluator(s)**	Prof.

B- PROFESSIONAL INFORMATION:

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

Classifications of mechanisms (pairs, links) - Synthesis of mechanisms - Design and analysis of modernism's trajectories - Vibration and undesired oscillation of mechanisms.

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,on one hand,with sufficient theoretical background to understand contemporary mechanism design techniques and,on other hand,of developing skills for applying these theories in practice. Also, it represents the culmination of research toward a general method of kinematic and dynamic analysis and synthesis. Further this objective is to serve as a source-work for the researcher.

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.
	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	Classifications of Mechanisms(Pairs nd links): -Mechanism and Machine -Pairing elements and link,chain	a1-1, a2-1, b1-1, d1-1
2	Transmission of Machine. -Position analysis of the Four-Bar Linkage.	a1-1, a3-1, d1-1
3	Synthesis of Mechanisms: Classification of Kinematics Synthesis Problems.	a1-1, a3-1, c1-1, c2-1,
4	Analysis Versuse Synthesis. Tasks of Kinematic Synthesis.	a1-1, a2-1, b1-1
5	Analytical Design of a Four-Bar Linkage as a Function Generator Graphical Design of a Four-Bar Linkage as a Function Generator	a1-1, a4-1, c3-1, c4-1,
6	Synthesis Using Complex Number Design of a Four-Bar Linkage as a Path Generator Using Cognates	b1-1, b2-1, b1-1, b2-1
7	Design and Analysis of Mechanis"s Trajectories	b2-1, b3-1, c1-1, c2-1,
8	Examples for Design and Analysis of Mechanis"s Trajectories	c1-1, c2-1, c3-1, c4-1,
9	Introduction – Spatial Mechanisms, Describing the spatial Motions	a1-1, a2-1, c1-1, c2-1,
10	Kinematic Analysis of spatial Mechanisms Kinematic Synthesis of Spatial Mechanisms	a2-1, a4-1, d1-1
11	Vibration and Undesired Oscillation of Mechanisms	b3-1, b2-1, c2-1, c3-1,
12	Examples of Nonlinear Vibration Problems	b1-1, b3-1, d1-1
13	Aproximate Analytical Methods	c1-1, c4-1, d1-1
14	Graphical Method	b1-1, b4-1, c1-1, c3-1,
15	Stability of Equilibrium States	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):

1 Edward J. Haug,Jasbir S. Arora,Applied Optimal Design(Mechanical and Structural Systems),John Wiley and Sons,New York,1979
2 George N. Sander,Arthur G. Erdman,Advanced Mechanism Design(Analysis and Synthesis),Englewood Cliffs, New Jersy,USA, 1984
3 Hamilton H. Mabie,Charles F. Reinholtz,Mechanisms and Dynamics of Machinery, John Wiley and Sons. Inc.,1987
4 Singiresu S. Rao,Mechanical Vibration,Education Asia Ltd,Hall,Montreal,Canada,2005

Periodicals, Web sites, Course notes, etc:

1. http://www.journals.elsevier.com/mechanism-and-machine-theory/
2. http://mechanismsrobotics.asmedigitalcollection.asme.org/journal.aspx
3. www.bspuni.com/.../theory of machines/theory of machines notes.pdf
4. www.kgce.org/assignments 2011-12/mech/theory of machines (iv) - b.pdf

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.):-
A lecture room with computer and LCD or data show

Course coordinator

Prof. Dr. Sabry Elshakery,
Dr. Raafat Abou-elnasr

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:	**Industrial Statistic I**
Course Code:	**PRE 518**
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.**	**Diploma - 500**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Ali Elmasry**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

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

Introduction to statistics - Types of data - Presentation of data: graphically and numerically - Theory of probabilities - Random variables - Discrete and continuous probability distributions- and confidence intervals.

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 students with a means of analysis and how to determine the probability and industrial statistics are fascinating subjects on the interface between mathematics and applied sciences that help us understand and solve practical problems. We believe that you, by

learning how stochastic methods come about and why they work, will be able to understand the meaning of statistical statements as well as judge the quality of their content, when facing such problems on your own. Our philosophy is one of how and why: instead of just presenting stochastic methods as cookbook recipes, we prefer to explain the principles behind them.

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, A2	B1, B3	C1, C2	D2,

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A-1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1-1) Apply knowledge of mathematics, science and production engineering concepts in practice.
	A-2) Understand the basics of quality in professional production engineering practice according to specialization.	a-2-1) Identify professional production engineering problems and propose solutions for them.
Intellectual skills	B-1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Employ the available resources efficiently.
	B-3) Read and analyze researches and topics related to the production engineering specialization.	b-3-1) Be aware of the need to develop him/her-self and to be engaged with continuous learning in production engineering.
Professional skills	C-1) Apply the professional production engineering technologies in the field of specialization.	c-1-1) Apply production engineering technology in practice.
	C-2) Write professional production engineering reports.	c-2-1) Communicate and manage the team work within the engineering discipline.
General skills	D-2) Use information technology to serve the development of production engineering professional practice.	d-2-1) Employ the available resources efficiently.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction to statistics	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, .
2	Types of data	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
3	Presentation of data	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
4	Exploratory data analysis: graphical summaries	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, .
5	Old faithful data	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
6	Histograms	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
7	Kernel density estimates	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
8	The empirical distribution function	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
9	Exploratory data analysis: numerical summaries	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, d-4-1.
10	The center of a dataset	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
11	The amount of variability of dataset	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
12	Theory of probabilities	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, d-4-1.
13	Random variables	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1, d-4-1.
14	The probability distribution of a discrete random variable	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
15	The probability distribution of a continuous random variable	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-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	Assignments and Exercises	a-1, a-2, b-1, b-3, c-1, c-2, d-2,	a-1, a-2, b-1, b-3, 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-3, c-1, c-2, d-2	a-1, a-2, b-1, b-3, 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):

" A Modern Introduction to Probability and Statistics", F.M. Dekking, C. Kraaikamp, H.P. Lopuhaa and L.E. Meester, British Library Cataloguing in Publication Data, ISBN- 1852338962, Library of Congress Control Number: 2008930567 © Springer-Verlag London Limited 2005.

13.3- Recommended books

" Introduction to Engineering Statistics and Six Sigma " Theodore T. Allen, British Library Cataloguing in Publication Data, © Springer-Verlag London Limited 2006, ISBN-10: 1-85233-955-1

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

Dr. Ali Elmasry

Head of Dept.

Prof. Taha El-Taweel

Date-- 25 November 2013

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

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Industrial Statistics II**
Course Code:	**PRE 519**
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.**	**Diploma - 500**
5	**Pre-requisites course.**	**Industrial Statistic I**
6	**Pre-requisites by Topic**	**None**
7	**Coordinator**	**Dr. Ali Elmasry**
8	**External Evaluator(s)**	**Prof.**

B- PROFESSIONAL INFORMATION:

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

Sampling distributions for means - proportion range - standard deviation. Hypothesis testing - goodness of fits - simple and multiple regressions.

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 students with a means of analysis and how to determine the probability and industrial statistics are fascinating subjects on the

interface between mathematics and applied sciences that help us understand and solve practical problems. We believe that you, by learning how stochastic methods come about and why they work, will be able to understand the meaning of statistical statements as well as judge the quality of their content, when facing such problems on your own. Our philosophy is one of how and why: instead of just presenting stochastic methods as cookbook recipes, we prefer to explain the principles behind them.

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, A2	B1, B3	C1, C2	D2,

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A-1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1-1) Apply knowledge of mathematics, science and production engineering concepts in practice.
	A-2) Understand the basics of quality in professional production engineering practice according to specialization.	a-2-1) Identify professional production engineering problems and propose solutions for them.
Intellectual skills	B-1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Employ the available resources efficiently.
	B-3) Read and analyze researches and topics related to the production engineering specialization.	b-3-1) Be aware of the need to develop him/her-self and to be engaged with continuous learning in production engineering.
Professional skills	C-1) Apply the professional production engineering technologies in the field of specialization.	c-1-1) Apply production engineering technology in practice.
	C-2) Write professional production engineering reports.	c-2-1) Communicate and manage the team work within the engineering discipline.
General skills	D-2) Use information technology to serve the development of production engineering professional practice.	d-2-1) Employ the available resources efficiently.

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

Week No.	Contents	ILOs covered by this topic
1	Sampling distributions for means	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
2	Mean and variance	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
3	Low of large numbers	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
4	Central – limit theorem	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
5	Bernoulli and Poisson distributions	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
6	Proportion range	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
7	Standard deviation	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
8	Hypothesis testing	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
9	Simple hypothesis versus simple alternative	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
10	Composite hypotheses	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
11	Tests of hypotheses – sampling from the normal distribution	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
12	Goodness of fits	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
13	Kolmogorov – Smirnov goodness – of – fit test	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
14	Simple regressions	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
15	Multiple regressions	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-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	Assignments and Exercises	a-1, a-2, b-1, b-3, c-1, c-2, d-2,	a-1, a-2, b-1, b-3, 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-3, c-1, c-2, d-2,	a-1, a-2, b-1, b-3, 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):

"Introduction to the Theory of Statistics", Harriet, Joan, Lisa and Karin, Copyright ©1963, 1974 by McGraw- Hill, Inc. All rights reserved, ISBN- 0-07-042864-6.

13.3- Recommended books

" Introduction to Engineering Statistics and Six Sigma " Theodore T. Allen, British Library Cataloguing in Publication Data, © Springer-Verlag London Limited 2006, ISBN-10: 1-85233-955-1

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

Dr. Ali Elmasry

Head of Dept.

Prof. Taha El-Taweel

Date-- 25 November 2013

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Engineering Economy**
Course Code:	**PRE 520**
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.**	**Diploma**	
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 Kinematics and Dynamics of Open kinematic chains.

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 assess the projects economically. This course will also provide students with the ability to select the appropriate project among alternatives and realizing of the different methods of depreciation for equipments. The skill of setting cash flow diagram of different alternative configurations is also provided.

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,A4	B1,B5	C1,C2	D1,D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A1. Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1 Explain the engineering economy techniques and concepts to the solution of the engineering problems
	A3. Know requirements for safe operation and conservation of the environment.	a-3 Compare between the different engineering economy techniques
	A4. Understand the moral and legal principles of professional practice in production engineering.	a-4 Define the basics concepts of the engineering theories that required for solving the engineering applications problems
Intellectual skills	B1. Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1 Design the suitable method to Judge engineering decisions considering balanced costs
	B5. Make career decisions in the light of available production engineering information.	b-5 Apply replacement analysis based on economic life for the equipments.
Professional skills	C1. Apply the professional production engineering technologies in the field of specialization.	c-1 Use depreciation methods to compute the annual depreciation and book value for equipments.
	C2. Write professional production engineering reports.	c-2 Asses the cash flow diagram for a project .
General skills	D1. Self-assessment to identify personal learning needs.	d-1 Self-assessment to identify personal learning needs.
	D2. Be familiar with the leadership of the team in professional contexts.	d-2 Be familiar with the leadership of the team in professional contexts.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	- Fundamental Engineering economic Concepts – Direct and indirect costs. – Variable and fixed costs.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
2	- Simple interest versus Compound interest - Nominal and effective interest rate.- The time value of money.- Cash flow diagram.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
3	Development of Interest formulas - Single cash flow formulas -Uniform Series Payments	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
4	- Gradient uniform series - Uniform Infinite series	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
5	- Minimum Attractive Rate of return -Bases for comparison of alternatives -Payback period method.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
6	- Present Worth value method. - Equivalent uniform value method.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
7	- Internal rate of return method - Benefit-Cost ratio method.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
8	Break-even Analysis: single	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
9	Break-even Analysis: Two and Multiple alternatives	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
10	- Depreciation and its value - Classifications of Depreciation - Annual depreciation and book value calculation methods: * Straight Line Method.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
11	*declining Balance Method. *Sum-of the Years-Digits Method.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
12	- Decision making among alternatives - types of investment proposals - Mutually exclusive alternatives and decision making.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
13	- Decision Criteria for mutually exclusive alternatives.- Applying decision criteria when money is limited. - Comparison of alternatives with unequal service lives.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
14	- The general nature of replacement analysis. – Replacement analysis for unequal lives.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,
15	- Replacement analysis based on economic life. – Examples of replacement Analyses.	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-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	Assignments and Exercises	a-1, a-2, b-1, b-3, c-1, c-2, d-2,	a-1, a-2, b-1, b-3, 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-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, d-2-1,	a-1-1, a-2-1, b-1-1, b-3-1, c-1-1, c-2-1, 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):

- Recommended books

1- "Engineering Economics", Michel Wilkes , 3th Edition , McGraw-Hill, 2001

2 - "Contemporary Engineering Economics", Chan S. Park , 3th Edition , Prentice Hall, 2002

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:	**Operations Research I**
Course Code:	**PRE 521**
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.**	**Post Graduate Diploma**	
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:*

Decision making process - Problem solving technique - Linear programming model and its solution graphically and analytically- Sensitivity analysis - interpretation to the computer output of LP solution- transportation - transshipment and assignment problems - Shortest route problem - integer programming.

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 fundamentals of decision making using mathematical modeling. The main focus for this course is addressing the deterministic models in operations research. A strong emphasis will be given to understanding model assumptions,

formulation as well as solution methodologies. Application to real-world problems in model formulation and solution using software packages is also considered in this course. This course also helps in enhancing the student capabilities in analyzing, interpreting, and assessing sensitivity of the optimal solution due to variations in the decision making environment.

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, B2, B5	C1,C2	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1-1) Explain fundamental concepts of operations research theory a-1-2) Recognize the basics for using mathematical modeling in decision making. a-1-3) Identify the basic assumptions for different models. a-1-4) Illustrate solution procedures for different applications.
	A3) Know requirements for safe operation and conservation of the environment.	a-3-1) Express the limited resources in the decision making environment
Intellectual skills	B1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Formulate production engineering related problems into mathematical programing models. b-1-2) Analyze the sensitivity of the optimal solution with respect to different changes in decision environment.
	B2) Solve production engineering problems in the area of specialized career.	b-2-1) Solve linear and integer programing problems graphically and analytically b-2-2) Solve specialized linear programming problems like the transportation and assignment problems. b-2-3) Solve network models like the shortest path
	B 5) Make career decisions in the light of available production engineering information	b-5-1) Manage decision making and seeking optimal solutions using limited resources.
Professional skills	C1) Apply the professional production engineering technologies in the field of specialization .	c-1-1) Applying practically the appropriate operations research techniques in real-life scenarios. c-1-2) Develop and evaluate solutions for real-life applications using LINDO software

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C2. Write professional production engineering reports.	c-2-1) Report and interpret findings in a scientific and concise manner
General skills	D2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Demonstrate skills using LINDO software package.

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

Week No.	Contents	ILOs covered by this topic
1	Introduction to operations research and mathematical modeling	a1-1, a1-2, a3-1
2	Linear Programming (model assumptions & problem formulation)	a1-2, a1-3, b1-1, b5-1
3	Linear Programming (graphical solution)	a1-4, b2-1, c2-1
4	Linear Programming (The Simplex method)	a1-4,b2-1, c2-1
5	Special cases in The Simplex method	b2-1
6	Sensitivity analysis	a3-1, b1-2
7	Sensitivity analysis	a3-1, b1-2
8	Using LINDO to solve LP problems	c1-1,c1-2, c2-1, d2-1
9	The Transportation Model-Basic Assumptions Feasible Solution: The Northwest Method, Vogel's Method	a1 -3, a1-4,b2-2
10	The Transportation Model - Optimal Solution: The Stepping Stone Method, Modified Distribution (MODI) Method	a1-4,b2-2, c2-1
11	The Assignment Model:- Basic Assumptions Solution Methods-Short-Cut Method (Hungarian Method)	a1 -3, a1-4,b2-2, c2-1
12	Transshipment Problems	a1 -3, a1-4,b2-2, c2-1
13	Network Models-Shortest route problem	a1 -3, a1-4,b2-3, c2-1
14	Integer programming- model formulation	a1-2,a1-3, b1-1,c1-1
15	Integer programming-Solution using branch and bound	a1-4,b2-1,c2-1

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

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Lectures	a1-1, a1-2, a1-4, b1-1, b1-2, b2-1, b2-2, b2-3, c1-2	A1, B1, B2, C1
2	Class discussions	a1-3, a3-1, b1-1, b5-1, c1-1, c2-1, d2-1	A1, A3, B1, B5, C1, C2, D2

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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, b1-1, b1-2, b2-1, b2-2, b2-3, b5-1, c1-1, c2-1	A1, A3, B1, B2, B5, 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):

Introduction to Operations Research, by F. S. Hillier and G. J. Lieberman, McGraw Hill 2005, eighth edition.

Recommended books

Operations Research, an introduction, by H. A. Taha, Prentice Hall, 2003, sixth edition.
Operations Research: applications and algorithms, by W. L. Winston, Thomson Brooks/Cole, 2004, fourth edition.
Operations Research: A Model-Based Approach, by H. A. Eiselt and C.L. Sandblom, Springer, 2012.

Periodicals, Web sites, Course notes, etc:

1. The Institute for Operations Research and the Management Sciences (INFORMS) https://www.informs.org/
2. Operations Research Journal http://pubsonline.informs.org/journal/opre
3. International Federation of Operational Research Societies (IFORS) Education Resources http://ifors.org/wiki/index.php?title=Main_Page

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 LINDO API 8.0 software installed

Course coordinator

Dr. Omayma Nada

Head of Dept.
Prof. Taha El-Taweel

Date / /

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Operations Research II**
Course Code:	**PRE 522**
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.**	**Post Graduate Diploma**	
5	**Pre-requisites course.**	**PRE 521**	
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:*

Waiting line models- computer simulation - Dynamic programming - Branch and bound method - nonlinear programming

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 essential skills to formulate and solve stochastic models in operations research. In particular, it presents elementary waiting line (queuing) models and their basic formulas and measures of performance. Modeling dynamic programming

problems as well as computer simulation will be addressed in this course. This course is also designed to provide students with the basic knowledge of nonlinear programming applications.

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, A3	B1, B2, B5	C1,C2	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1-1) Compare between deterministic and stochastic models a-1-2) Identify the assumptions and concepts associated with different models. a-1-3) Recognize the characteristics of dynamic programming, integer programing, wailing line models, and simulation models. a-1-4) Illustrate solution procedures for different models. a-1-5) describe the differences between Linear and Nonlinear Programming.
	A3) Know requirements for safe operation and conservation of the environment.	a-3-1) Express the limited resources in the decision making environment.
Intellectual skills	B1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b-1-1) Formulate practical problems into mathematical models. b-1-2) Analyze the results of a model, interpret them, and concisely present the insights obtained from their analysis.
	B2) Solve production engineering problems in the area of specialized career.	b-2-1) Solve dynamic and integer programing problems b-2-2) Solve constrained and unconstrained nonlinear programming problems.
	B 5) Make career decisions in the light of available production engineering information	b-5-1) Manage decision making and seeking optimal solutions using limited resources.
Professional skills	C1) Apply the professional production engineering technologies in the field of specialization .	c-1-1) Selecting and applying practically the appropriate operations research techniques in real-life scenarios. c-1-2) Develop and evaluate solutions for real-life applications using MS Excel and LINGO software. c-1-3) Assess the performance of waiting lines

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C2) Write professional production engineering reports.	c-2-1) Report and interpret findings in a scientific and concise manner.
General skills	D2) Apply information technology tools related to specific production engineering discipline.	d-2-1) Demonstrate skills in using software packages to solve different problem.

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

Week No.	Contents	ILOs covered by this topic
1	Classification of operations research models	a1-1, a1-5
2	Introduction to queuing models	a1-2, a1-3, a1-4
3	Distribution of arrival and service time	a1-2, a1-3, a1-4
4	The Kendall–Lee Notation for Queuing Systems	a1-2, a1-3, a1-4
5	Steady-state measures of performance for Queuing Systems	a1-3, b1-2, c1-3
6	Introduction to simulation- Basic Terminology	a1-2, a1-3, a1-4
7	Random Numbers and Monte Carlo Simulation	a1-4, c1-1, c1-2
8	Discrete-event simulation models	a1-4, c1-1, c1-2
9	Characteristics of dynamic programming	a1-2, a1-3, a1-4
10	Forward and backward recursion in dynamic programming	a1-4, b2-1
11	Dynamic programming applications	b1-1, b1-2, b2-1, c1-1, c1-2, c2-1, d2-1
12	Integer programming models – solution using Branch-and-bound algorithm	b1-1, b1-2, b2-1, b5-1 c1-1, c1-2, c2-1
13	Introduction to nonlinear programming models	a1-2, a1-5, a3-1
14	Unconstrained nonlinear programming algorithms	a1-4, b1-1, b1-2, b2-2, d4-1
15	Constrained nonlinear programming algorithms	a1-4, a3-1, b1-1, b1-2, b2-2, b5-1, 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	Lectures	a1-1, a1-2,a1-3, a1-4, a1-5, a3-1, b1-1, b1-2, b2-1, b2-2, b5-1, c1-1, c1-2, c1-3, c2-1, d2-1	A1, A3, B1, B2, B5, 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	a1-1, a1-2,a1-3, a1-4, a1-5, a3-1, b1-1, b1-2, b2-1, b2-2, b5-1, c1-1, c1-2, c1-3, c2-1	A1, A3, B1, B2, B5, 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):

Operations Research: applications and algorithms, by W. L. Winston, Thomson Brooks/Cole, 2004, fourth edition.

Recommended books

Operations Research, an introduction, by H. A. Taha, Prentice Hall, 2003, sixth edition.

Introduction to Operations Research, by F. S. Hillier and G. J. Lieberman, McGraw Hill 2005, eighth edition.

Operations Research: A Model-Based Approach, by H. A. Eiselt and C.L. Sandblom, Springer, 2012.

Periodicals, Web sites, Course notes, etc:

1. The Institute for Operations Research and the Management Sciences (INFORMS) https://www.informs.org/
2. Operations Research Journal http://pubsonline.informs.org/journal/opre
3. International Federation of Operational Research Societies (IFORS) Education Resources http://ifors.org/wiki/index.php?title=Main_Page

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 Excel and LINGO software installed

Course coordinator

Dr. Omayma Nada

Head of Dept.

Prof. Taha El-Taweel

Date: / /

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	***Statistical Process Control I***
Course Code:	***PRE 523***
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: 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.)***	***Diploma in Production Engineering and Mechanical Design***
4	***Level at which this course is offered.***	***Level 500***
5	***Pre-requisites course.***	***NONE***
6	***Pre-requisites by Topic***	***Industrial Statistics***
7	***Coordinator***	***Dr. ABEER SOBHY EISA***
8	***External Evaluator(s)***	***Prof. Dr……***

B- PROFESSIONAL INFORMATION:

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

The course focuses philosophy behind Statistical process and improvement of quality using statistical tools, tests and methods such as Design Of Experiments (DOE), Taguchi methods, control charts for attributes and capability analysis. Also, Course assessment will include: control charts for moving averages and cumulative sum.

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 have a broad knowledge of various modern industrial engineering methods and tools associated with designing systems in statistical process control and other related fields. Targets also includes, but not limited to:
1.The basic methods of statistical process control (SPC) as problem solving tools and methods for process capability analysis and statistical inferences.
2.Describing the statistical basis of Control charts for variables and attributes outcomes.
3.Developing ability to adopt a scientific approach to any type of problems faced by individuals or society.
4 Developing and extend the students knowledge of analytical techniques and application of statistical methods.

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,	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 advanced statistical process control.	a-1-1) Integrate theories, fundamentals and knowledge of information technology in statistical process control
	A-2) Identify professional production engineering problems and propose statistical process solutions for them.	a-2-1) Understand the basics of quality in professional production statistical process control according to specialization.
Intellectual skills	B-1) Identify and analyze statistical process control problems in the area of advanced methods of statistical methods.	b-1-1) Able to use statistical methods for design the statistical process control and different flow charts .
	B-4) Assess the risks in professional production engineering practices in this field.	b-4-1) Create the desired software dealing with the used statistical process control methods for modeling and analyzing production quality problems.
Professional skills	C-1) Apply the professional production engineering technologies in the field of statistical quality control problems.	c-1-1) Able to assess limitations and opportunities to decide on solving the production quality problems.
	C-2) Write professional production quality reports.	c-2-1) Write and evaluate professional reports in the field of Statistical Quality Control.
General skills	D-2) Effectively communicates all kinds and sharing ideas with different statistical quality control methods.	d-2-1) Use information technology of advanced statistical methods to serve the development of professional practice in quality control methods.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1.	Introduction to International standard system of statistical process control,	a-1-1, b-1-1, b-4-1, c-1-1
2.	Concepts of statistical process control,	a-1-1, b-1-1, b-4-1, c-1-1
3.	The basic methods of statistical process control (SPC),	a-1-1, b-1-1, b-4-1, c-1-1
4.	Different methods of Design Of Experiments (DOE),	a-1-1, b-1-1, b-4-1, c-1-1
5.	Design Of Experiments (DOE) using Taguchi methods,	a-1-1, b-1-1, b-4-1
6.	Statistical basis of Control charts,	a-1-1, b-1-1, b-4-1, c-1-1
7.	Analysis and draw Control charts for attributes,	a-2-1,b-4-1, b-5-1, c-2-1, d-2-1
8.	Analysis and draw Control charts for attributes and capability analysis,	a-1-1, b-1-1, b-4-1
9.	Statistical basis of Control charts for variables,	a-1-1, b-1-1, b-4-1, c-1-1
10.	Analysis and draw Control charts for variables,	a-1-1, b-1-1, b-4-1
11.	Statistical basis of Control charts for moving averages,	a-1-1, b-1-1, b-4-1, c-1-1
12.	Analysis and draw Control charts for moving averages,	a-1-1, b-1-1, b-4-1
13.	Analysis and draw Control charts for cumulative sum.	a-1-1, b-1-1, b-4-1
14.	Scientific approach to any type of problems faced by individuals or society.	a-2-1,b-4-1c-2-1, d-2-1
15.	Analytical techniques and application of statistical process control methods using advanced computer programme.	a-1-1, a-2-1,b-1-1,b-4-1, c-2-1, , d-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-4c-1, c-2	a-1,a- 2, 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):

-B. Kumar, "Industrial Engineering & Management", Khana Pub., 2004
- Eugenel Grant, "Statistical Quality control , McGraw –Hill,1996.

Periodicals, Web sites, Course notes, etc:

- Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers and Keying Ye; Probability And Statistics For Engineers And Scientists 7th Ed., 2002, Prentice Hall Inc, ISBN: 0-13-098469-8.
- Roxy Peck, Chris Olsen, Lay L. Devore; Introduction to Statistics and data Analysis, Duxbury Press, 2 ed., 2004, ISBN: 0534467105.

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:	***Statistical Quality Control II***
Course Code:	***PRE 524***
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: 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.)*	*Diploma in Production Engineering and Mechanical Design*
4	*Level at which this course is offered.*	*Level 500*
5	*Pre-requisites course.*	*Statistical Process Control I*
6	*Pre-requisites by Topic*	*Statistical Quality Control and Industrial Statistics*
7	*Coordinator*	*Dr. ABEER SOBHY EISA*
8	*External Evaluator(s)*	*Prof. Dr……*

B- PROFESSIONAL INFORMATION:

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

The aims of this course are to understand the advanced treatment of quality systems and cost of quality. Also, understand and analyze total quality management, statistical process control for batch production, control charts for acceptance sampling and quality systems and standards .Statistical quality control such as ; control charts for variables and attributes, optimum design for control charts and process capability analysis must be also understanding , analyze and drawing.

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 have a broad knowledge of various modern industrial engineering methods and tools associated with designing systems in statistical process Control and other related fields. Targets also includes, but not limited to:
1.Students will have the ability to apply statistical methods to represent, integrate and solve problems, including the ability to recognize problem context and integrate knowledge and skills appropriate sources.
2. Have hands on both advanced statistical methods and advanced computer programs for monitoring and solving statistical problems under operating conditions.
3.Design different types of flow charts ,collect primary data , analyze and draw the results.

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 advanced statistical methods.	a-1-1) Integrate theories, fundamentals and knowledge of information technology in statistical methods.
	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 advanced methods of Statistical methods.	b-1-1) Able to use statistical methods for design the statistical process control and flow charts .
	B-4) Assess the risks in professional production engineering practices.	b-4-1) Create the desired software dealing with the used statistical methods for modeling and analyzing statistical problems.
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 production quality reports.	c-2-1) Write and evaluate professional reports in the field of statistical quality control.
General skills	D-2) Effectively communicate all kinds and sharing ideas with different statistical quality control. methods.	d-2-1) Use information technology of advanced Statistical methods to serve the development of professional practice.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1.	Introduction to International standard system of statistical quality control,	a-1-1, b-1-1, b-4-1, c-1-1
2.	Concepts of statistical quality control,	a-1-1, b-1-1, b-4-1, c-1-1
3.	Statistical process control for batch production,	a-1-1, b-1-1, b-4-1, c-1-1
4.	Analyze the different types of statistical process control,	a-1-1, b-1-1, b-4-1
5.	Understand and analyze total quality management,	a-1-1, b-1-1, b-4-1, c-1-1
6.	Analyze the different types of control charts for acceptance sampling,	a-1-1, b-1-1, b-4-1
7.	Introduction to control charts for variables and attributes,	a-1-1, b-1-1, b-4-1, c-1-1
8.	Introduction to control optimum design for control charts and process capability,	a-1-1, a-2-1, b-1-1, b-5-1, c-1-1, c-2-1, d-2-1
9.	Draw and analyze control charts for variables and attributes,	a-1-1, b-1-1, b-4-1
10.	Analyze the different methods of optimum design for control charts and process capability,	a-1-1, b-1-1, b-4-1
11.	Solve and draw some of problems about optimum design for control charts and process capability,	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
12.	Application of advanced statistical methods on some problems using advanced computer programs,	a-1-1,b-1-1,b-4-1, b-5-1, c-2-1, , d-2-1,
13.	Monitoring and solving statistical problems under operating conditions using advanced computer programs,	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
14.	Design different types of flow charts ,collect primary data , analyze and draw the results,	a-1-1,b-1-1,b-4-1, b-5-1, c-2-1, , d-2-1,
15.	Data analysis and draw of optimum design for control charts using advanced computer programs.	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, 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, 2-3, b-1, 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):

- Probability and Statistics in Engineering, Fourth Edition, William W. Hines, Douglas C.Montgomery, David M. Goldsman & Connie M. Borror, John Wiley and Sons, (2003),ISBN: 0-471-24087-7
-Eugenel Grant, "Statistical Quality control , McGraw –Hill,1996.

Periodicals, Web sites, Course notes, etc:

-QUALITY ASSURANCE AND QUALITY CONTROL, IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.
-International Organization for Standardization (ISO) (1994). Air Quality, Determination of Performance ,Characteristics of Measurement Methods. ISO 9196:1994. ISO, Geneva, Switzerland.

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

201Minoufiya University,
Faculty of Engineering,
Post Graduate Studies and Research.

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Production and Operations Management**
Course Code:	**PRE 525**
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.**	**Post Graduate Diploma**	
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:*

Introduction to management- types of productive systems - Operations strategy - process selection - Facility location - facility layout - inventory management - Project management

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 main objective of this course is to enhance the students' background with the basic approaches of operations management for manufacture and non-manufacturing organizations. The course begins with a holistic view of operations and highlights the coordination of product development, process selection as well as operations management. This course focuses on concepts and techniques that help in designing and operating production facilities to achieve the ultimate goals of the organization.

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, B2	C1,C2	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a1-1) Discuss the role of production/ operations management in organization in relation to other major business functions a1-2) Identify the major concepts of production and operations Management a1-3) Recognize the difference between operations management and project management
	A3) Know requirements for safe operation and conservation of the environment.	a3-1) Discuss the important factors of plant location and design, resource allocation, and equipment selection and utilization.
Intellectual skills	B1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities.	b1-1)Appraise factors and processes involved in production/operations system design b1-2)Identify bottleneck operations as well as critical project activities
	B2) Solve production engineering problems in the area of specialized career.	b2-1)Utilize systematic planning and control of all production management activities b2-2) Demonstrate the various decision making techniques used by operations managers and solve relevant problems
Professional skills	C1) Apply the professional production engineering technologies in the field of specialization .	c1-1) Utilize systematic planning and control of all production management activities c1-2) Optimize the use of resources which include: people, plant, equipment, tools, inventory, premises and information systems c1-3) Apply PERT and CPM techniques for planning and coordinating large-scale projects
	C2) Write professional production engineering reports.	c2-1) Recommend action plans that help in achieving production targets via implementing operations management tools.
General skills	D2) Apply information technology tools related to specific production engineering discipline	d2-1) Demonstrate ability to use Primavera Systems or Microsoft Project in operations management related problems

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction to production and operations management	a1-1, a1-2
2	Operations management objective/ strategic role of operations	a1-1, a1-2
3	Factors affecting process selection and capacity planning	a3-1, b1-1
4	Classification of production systems Job-shop production- Batch production	a3-1, b1-1
5	Classification of production systems Mass production - continuous production- recent advances in production systems.	a3-1, b1-1, b1-2
6	Factors influencing facility location decisions	a3-1
7	Models for facility location selection Weighted Factor Rating Method- Load-distance Method	b2-2, c2-1
8	Models for facility location selection Centre of Gravity- Break-even Analysis	b2-2, c2-1
9	Facility layout (objectives- principals –classification)	a3-1, b1-1
10	Procedure for designing process/ product layouts	a3-1, b1-1, c1-1
11	Basic concepts in inventory control or management	a1-1, a1-2
12	Inventory control models (economic order quantity)	a3-1,b2-2, c1-2, c2-1
13	Inventory control models (economic production quantity- quantity discounts)	a3-1, b2-2, c1-2, c2-1
14	Project management basic concepts	a1-1, a1-3
15	Project management (PERT –CPM)	b2-2, c1-3, 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	a1-1, a1-2, a1-3, a3-1, b1-1,b1-2, b2-1, b2-2, c1-1, c1-2, c1-3, c2-1, d2-1	A1, A2, A3, B1, B2, 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	a1-1, a1-2, a1-3, a3-1, b1-1,b1-2, b2-1, b2-2, c1-1, c1-2, c1-3, c2-1	A1, A2, A3, B1, B2, 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):

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

Recommended books

Jay Heizer & Barry Render, "Principle of Operations Management", 8th Ed., Prentice Hall, New Jersey 2011

Kumar, S. A., & Suresh, N., "Operations Management", New Age Int. Ltd, 2009

Periodicals, Web sites, Course notes, etc:

Production and Operations Management Society (POMS)
http://www.poms.org/

Production and Operations Management Journal - Wiley Online Library
http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1937-5956

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 Primavera Systems or Microsoft Project installed

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Course coordinator

Dr. Omayma Nada

Head of Dept.
Prof. Taha El-Taweel

Date: / /

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Maintenance Management**
Course Code:	**PRE526**
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: 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.)	**Diploma in Production Engineering.**
4	**Level at which this course is offered.**	**Level 500**
5	**Pre-requisites course.**	**Non**
6	**Pre-requisites by Topic**	**Non**
7	**Coordinator**	**Prof. Dr.**
8	**External Evaluator(s)**	**Prof. Dr.**

B- PROFESSIONAL INFORMATION:

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

Types of maintenance operations - economics of maintenance operations- preventive maintenance programs - predictive maintenance - estimation of required manpower - planning overall maintenance programs - Information systems for maintenance.

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 type of maintenance and the analysis of classical model. Targets also includes, but not limited to:

A. Optimize the use of available funds, personnel, facilities, and equipment through effective maintenance management methods.

B. Provide accurate data for maintenance and construction program decision making.
C. Systematically identify maintenance needs or deficiencies and capital improvement needs at all field stations.
D. Enable preparation of Service maintenance and construction budget requests using systematic, standardized procedures.
E. Monitor and document corrective actions, project expenditures, and accomplishments.
F. Conduct comprehensive condition assessments of all Service real and personal proper valued.

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, 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 mathematics, science and production engineering concepts in practice of main Maintenance Management	a-1-1) Integrate theories, fundamentals and knowledge of mathematics, science and information technology in Maintenance Management.
	A-3) Apply advanced engineering technology in practice of signal processing.	a-3-1) Know requirements for safe operation and conservation of. signal processing.
Intellectual skills	B-1) Identify and analyze problems in the area of management maintenance	b-1-1) Able to use standard methods for type of maintenance.
	B-5) Make career decisions in the light of available production engineering information about type of maintenance.	b-5-1)Assess risks in professional practices of type of maintenance..
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 type of maintenance .
	C-2) Write professional engineering reports.	c-2-1) Write and evaluate professional reports in the field of type of maintenance.
General skills	D-2) Effectively communicates all kinds and sharing ideas with different signal processing.	d-2-1) Use information technology of maintenance methods to serve the development of professional practice.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1.	Types of maintenance operations.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1
2.	Economics of maintenance operations	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1,c-2-1
3.	Preventive maintenance programs.	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1, c-2-1
4.	Predictive maintenance	a-1,a-3,b-1,b-2,c-1,c-2,d-1.
5.	. Predictive maintenance basics	a-1,a-3,b-1,b-2,c-1,c-2,d-1.
6.	. Predictive maintenance technique(vibration basics)	a-1-1, a-3-1, b-1-1, b-5-1, c-2-1, , d-2-1.
7.	Data. acquisition	a-3-1, b-5-1, c-2-1, , d-2-1.
8.	Signal processing application and representation	a-3-1, b-5-1, c-2-1, , d-2-1.
9.	Introduction to machinery fault diagnosis using vibration analysis	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1, c-2-1
10.	Resonance vibration control	a-1,a-3,b-1,b-2,c-1,c-2,d-1.
11.	Correcting faults that cause vibration	a-1-1, a-3-1, b-1-1, b-1-1, c-1-1, c-2-1
12.	estimation of required manpower	a-3-1, b-5-1, c-2-1, , d-2-1,
13.	planning overall maintenance programs	a-1-1, a-3-1, b-1-1, b-5-1, c-1-1, c-2-1, d-2-
14.	Information systems for maintenance.	a-1-1, a-3-1, b-1-1, b-5-1, c-1-1,c-2-1
15.	. Experimental and Quasi-Experimental Research	a-1-1, a-3-1, b-1-1, b-4-1, c-1-1,c-2-1

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. Maintenance management system handbook may 2002
u.s. fish and wildlife service department of the interior

.2. Practical Machinery Vibration Analysis and Predictive Maintenance
Paresh Girdhar BEng (Mech. Eng), Girdhar and Associates

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Periodicals, Web sites, Course notes, etc:

- NASA. 2000. *Reliability Centered Maintenance Guide for Facilities and Collateral Equipment*. National Aeronautics and Space Administration, Washington, D.C.

- Piotrowski, J. April 2, 2001. *Pro-Active Maintenance for Pumps, Archives, February 2001,* **Pump-Zone.com** [Report online]. Available URL: **http://www.pump-zone.com**. Reprinted with permission of Pump-Zone.com.

- Types of Maintenance Programs O&M Best Practices Guide, Release 3.0

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

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

1. Classroom.
2. Data show**.**
3.Diagnostis&machinery dynamic laboratories

Course coordinator

Dr. Fawkia Ramadan gomaa

Head of Dept.

Prof. Dr. Taha Ali El-Taweel

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATIONS

Course Title:	**Project**
Course Code:	**PRE 599**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**4/12/2013**

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	**Lab: - 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.)	**Production Engineering and Mechanical Design**	
4	**Level at which this course is offered.**	**Diploma**	
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:*

A student is required to perform an analytical and experimental study for one of the practical problems under the supervision of one or more of the Department members.

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 with the opportunity to synthesize knowledge from various areas of learning, and critically and creatively apply it to industrial applications. This course also enhances students' knowledge and enables them to acquire skills like collaboration,

communication, engineering sense and independent learning, prepares them for lifelong learning. In today's dynamic and fast-changing technology world, students need to learn how to engage with industrial and engineering issues presented in a manner that is less structured, not subject-specific and open-ended. Students need to learn to work together on tasks that require different skills and to apply experimentally what they have learned theoretically to complete the project in a group.

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, B3	C1,C2	D1, D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Integrate theories, a1. Integrate theories, fundamentals and knowledge of mathematics, science and information technology in production engineering practice.	a-1-1) Use quantitative methods to solve production engineering problems.
	A-2) Understand the basics of quality in professional production engineering practice according to specialization	a-2-1) Prove the ability to synthesize knowledge from various areas of production engineering.
Intellectual skills	B-1) Identify and analyze problems in the area of production engineering specialization and rank the results according to their priorities	b-1-1) Able to use quantitative methods of analyzing production problems
	B-3) Read and analyze researches and topics related to the production engineering specialization.	b-3-1) Able to use researches and topics related to the production engineering.
Professional skills	C-1) Apply the professional production engineering technologies in the field of specialization	c-1-1) Employ a suitable measuring instruments as well as building ideas in available tools as computer programs.
	C-2) Write professional production engineering reports.	c-3-1) Write professional production engineering reports.
General skills	D-1) Effectively communicates all kinds and sharing ideas with different relevant teams.	d-1-1) Able to communicate with different relevant teams.
	D-2) Use information technology to serve the development of production engineering professional practice.	d-2-1) Employ information technology to serve the development of production engineering professional practice

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction to how to prepare a project	a-1-1, a-2-1, b-1-1, c-1-1,c-2-1.
2	Survey on a specified engineering point related to the project.	a-1-1, a-2-1, b1-1 c-1-1,c-3-1
3	Survey on a specified engineering point related to the project	a-1-1, a-2-1, b-1-1, b3-1, c-1-1
4	Preparation of experimental samples	a-1-1, a-3-1, b-2-1, b5-1,c-3-1, d-2-1
5	Preparation of experimental samples	a-1-1, a-3-1, b-2-1, b5-1,c-2-1, d-2-1.
6	Make several experiments and collect data using measuring instruments and laboratory equipment	a-2-1, b-3-1, c-1-1,c-2-1, d-2-1.
7	Make several experiments and collect data using measuring instruments and laboratory equipment	a-2-1, b-1-1, b-3-1, c-1-1, d-1-1,d-2-1
8	Make several experiments and collect data using measuring instruments and laboratory equipment	a-2-1, b-1-1, b-3-1,c-1-1, d-1-1,d-2-1
9	Theoretical and numerical work analysis	b-3-1, c-1-1,c-2-1, d-2-1, d-1-1,d-2-1
10	Theoretical and numerical work analysis	b-3-1,c-2-1 d-1-1,d-2-1
11	Analysis ,discussion and Comparison between experimental and theoretical results	a-1-1, a-3-1, b-2-1, c-1-1,c-3-1, d-2-1.
12	Analysis ,discussion and Comparison between experimental and theoretical results	a-3-1, b-2-1, b5-1, c-1-1,c-3-1, d-2-1,
13	Preparing the final project report	a-1-1, a-3-1, b-2-1, b5-1 c-1-1,c-3-1, d-2-1
14	Preparing the final project report	a-1-1, a-3-1, b-2-1, c-1-1 ,c-3-1, d-2-1
15	Discussion and final evaluation of the project	a-2-1, b-3-1, c-1-1, d-4-1 ,d-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	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	Oral exam	a-1,b-2, c-1 c-2. d-1-1,d-2-1	a-2, b-1, c-1, c-2, d-1,d-2

Weighting of assessments:

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

B.8. *List of References:*

A. laboratory Usage:

Students are expected to demonstrate the ability to generate, develop and evaluate ideas and information so as to apply these skills as they carry out a project task.

B. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports.

Essential books (text books):

There are no Specific text books

Recommended books

Periodicals, Web sites, Course notes, etc:

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

Course coordinator

Prof. **Mahmoud Abo-Elkhier**

Head of Dept.

Prof. Taha El-Taweel

Date-- 19 Novemeber 2013