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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Simulation of Casting and Welding Processes**
Course Code:	**PRE 701**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**2/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

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

B- PROFESSIONAL INFORMATION:

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

Introduction - Solidification model - Numerical simulation - Flow of heat as fluids in casting and welding - Structure modeling - 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%	20%	30%	10%	100%

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

The objective of this course is to provide the student with means of analyzing the solidification models in casting and welding. As well as, this course provide the student with required skills of detecting the defects occurred in casting and welding zone. This course will also provide students with the required skills of identifying types of structure modeling.

B.3. Relationship between the course and the programe

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

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

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

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

Week No.	Contents	ILOs covered by this topic
1	Basic Solidification Concepts	a-1-1, a-3-1, b-2-1, c-3-1,c-4-1, d-2-1.
2	Solidification Modes and Constitutional Super-cooling	a-1-1, b-2-1, b-5-1, c-3-1, d-2-1
3	Micro segregation and Banding	a-3-1, b-2-1, b-5-1, c-3-1,c-4-1, d-2-1.
4	Fluid Flow and Metal Evaporation in Welding	a-1-1, a-2-1, b-2-1, c-3-1,c-4-1, d-2-1.
5	Fluid Flow in Weld Pools	a-1-1, a-2-1, b-2-1, c-3-1,c-4-1, d-2-1,
6	Metal Evaporation	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
7	Fluid Flow in Arcs Active Flux GTAW	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
8	Fluid Flow and Heat Transfer of casting	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
9	Weld Metal Solidification: Grain Structure	a-1-1, b-2-1, b-5-1, c-3-1,c-6-1, d-2-1.
10	Epitaxial Growth at Fusion Boundary Non epitaxial Growth at Fusion Boundary	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
11	Competitive Growth in Bulk Fusion Zone	a-1-1, a-2-1, b-3-1,c-6-1, d-2-1.
12	Effect of Welding Parameters on Grain Structure Weld Metal Nucleation Mechanisms	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1, d-2-1, d-4-
13	Grain Structure Control	a-1-1, a-2-1, b-5-1, c-3-1,c-6-1, d-2-1
14	Numerical simulation	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	**- %**
Practicahl Examination	**- %**
Semester Work	**- %**
Other Types of Assessment	**- %**
Total	**100 %**

B.8. *List of References:*

Essential books (text books):

"WELDING METALLURGY" SECOND EDITION ,Sindo Kou
Copyright © 2003 by John Wiley & Sons, Inc, Hoboken, New Jersey.

13.3- Recommended books

"Manufacturing Processes for Engineering Materials", F I F T H, E D I T I O N
Serope Kalpakjian, *Illinois Institute of Technology, Chicago, Illinois*

Periodicals, Web sites, Course notes, etc:

1. Int. J of material science.
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 Abo-Shady

Head of Dept.

Prof. Taha El-Taweel

Date-- 27 Nov, 2013

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Numerically Controlled Machine Tools-(CNC – II)**
Course Code:	**PRE 702**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**20/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

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

B- PROFESSIONAL INFORMATION:

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

Fundamental theory and application of numerically controlled machine tool from the viewpoints of design principles - elements of machining structure - control systems - codes – formats - and programming methods – Different advanced part programming for CNC – Assembly

Course Subject Area:

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

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of fundamental theory and application of numerically controlled machine tool from the viewpoints of design principles, elements of machining structure, control systems, codes, formats and programming methods and different advanced part programming for CNC and assembly.

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& A4	B1, B3, B4& B8	C1,C2& C3	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1) Understand and know theories, principles, and updated as well as novel topics in production engineering specializations and the related fields.	a1-1) Discuss the theory, basics and practices of mathematics, sciences which related to CNC technology.
	A3) Know the scientific developments in the machine design dealing with applied mechanics.	a3-1) Discuss the scientific developments in the role of CNC in engineering.
	A4) Know the principles and fundamentals of quality in engineering.	a4-1) Describe the principles and fundamentals of quality in production engineering.
Intellectual skills	B1) Analyze and evaluate production engineering information.	b1-1) Analyze and evaluate the data and use them to solve the CNC problems.
	B3) Perform research studies which can add to the production engineering knowledge.	b3-1) Create the suitable solutions of problems dealing with CNC through the application of specific research studies which can add to the production engineering knowledge.
	B4) Formulate scientific papers.	b4-1) Formulate scientific papers dealing with CNC machines.
	B8) Be innovative and creative.	b8-1) Create the suitable solutions of problems dealing with CNC.
Professional skills	C1) Perfect the basic and up-to-date professional skills in production engineering.	1-1) Apply efficiently available tools as computer programs and the suitable techniques for solving the CNC problems.
	C2) Write and evaluate professional reports.	c2-1) Write and evaluate professional reports about CNC machining.
	C3) Evaluate and develop methods and tools applied in production engineering.	c3-1) Evaluate and develop different methods and tools for solving the CNC technology problems.
General skills	D2) Use information technology to serve the development of professional practice.	d2-1) Revise the information technology tools related to CNC technology.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction to NC Systems	a1-1, a3-1, b1-1, d2-1
2	The Components of the CNC system	a1-1, a4-1, d2-1
3	Part Program	a1-1, a4-1, c1-1, c2-1,
4	Main CNC System Functions	a1-1, a3-1, b1-1
5	G&M-code Interpreter	a1-1, a4-1, c2-1, c3-1,
6	Hardware Interpolator	b1-1, b3-1, b4-1, b2-1
7	Software Interpolator	b3-1, b8-1, c1-1, c2-1,
8	Acceleration and Deceleration	c1-1, c2-1, c3-1, c4-1,
9	PID Control System	a1-1, a3-1, c1-1, c2-1,
10	Numerical Control Kernel	a2-1, a4-1, d2-1
11	Programmable Logic Control	b3-1, b4-1, c2-1, c3-1,
12	Man–Machine Interface	b1-1, b3-1, d2-1
13	CNC Architecture Design	c1-1, c4-1, d2-1
14	Design of PC-NC and Open CNC	b1-1, b4-1, c1-1, c3-1,
15	STEP-NC System	b3-1, b8-1, c2-1, c3-1,

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Discussion, Assignments and Exercises, Problem solving, Brain storming, Site visits, Discovering and Self-learning	a1-1, a3-1, a24-1, a4-1, b1-1, b3-1, b4-1, b8-1, c1-1, c2-1, c3-1, d2-1.	A1, A3, A4, B1, B3 ,B4, B8, C1, C2, C3, D2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a3-1, a24-1, a4-1, b1-1, b3-1, b4-1, b8-1, c1-1, c2-1, c3-1, d2-1.	A1, A3, A4, B1, B3 ,B4, B8, C1, C2, C3, D2

Weighting of assessments:

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

B.8. *List of References:*

Essential books (text books):

S.H. Suh , S.K. Kang, D.H. Chung, and I. Stroud, "Theory and Design of CNC Systems" Springer

Recommended books

Chang, C. H., Melkanoff, M. A. "NC Machine Programming and Software Design", Prentice Hall, Upper Saddle River, NJ., 1989.

Periodicals, Web sites, Course notes, etc:

- "International Journal of Advanced Machining Processes" Springer

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

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

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

Course coordinator

Prof

Head of Dept.

Prof. Taha 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:	**Mechatronics**
Course Code:	**PRE 703**
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.**	**Doctor of Philosophy in Engineering**	
5	**Pre-requisites course.**	**Numerically Controlled Machine Tools (PRE 609)**	
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 mechanical, electronics, control engineering, computers, and information technology

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 a combination of mechanical, electronics, control engineering, computers, and information technology integrated through a design process. This course gives the basic principles and operational performance of mechatronic systems and introduces application of decision making to the actuation and sensing real physical systems. 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	B2,B6	C1,C4	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A1. Understand and know theories, principles, and updated as well as novel topics in production engineering specializations and the related fields.	a-1 Understand the principles of information technology , computers , control and software, and the fundamentals of computer usage in control – interfaces - and i/o for computers.
	A3. Know and understand moral and legal principles of professional practice in production engineering.	a-3 Describe the operational performance of mechatronic systems
	A4. Know the principles and fundamentals of quality in engineering.	a-4 Recognize the important roles of electronics in mechanical power engineering
Intellectual skills	B2. Solve engineering problems based on the data available and possibly contradicting information.	b-2 demonstrate at an appropriate level the interfacing and software needs of different parts of mechatronic systems.
	B6. Plan the performance development in production engineering.	b-6 Analyze the operational performance of mechatronic systems such as actuators , and hydraulic / pneumatic systems
Professional skills	C1. Perfect the basic and up-to-date professional skills in production engineering.	c-1 integrate electrical , electronic and mechanical components and equipment with actuators and controllers in creatively computer controlled systems.
	C4. Use technology to serve the professional practice.	c-4 analysis of date acquisition systems for fluid level control.
General skills	D2. Use information technology to serve the development of professional practice.	d-2 apply computer usage in control-interfaces – and I/O for computers .

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	- Introduction (overview) : Mechatronics configuration	a1 &a3
2	- Electrical- Mechanical interfacing. - Philosophy of the integration of mechanical , electronic and computer engineering.	a1 &a4
3	- Digital circuits in mechanical systems.	b1&a1
4	- Digital electronics – Analog electronics.	c2&b5
5	- Analysis and application of computerized machinery connections.	c1
6	- Control theory :modeling and analysis. -Computer usage in control – interfaces – I/O for compilers	c2&b5
7	- Mechanical components selection.	C1&d2
8	- Mechanisms for motion transmission (Rotary to rotary motion – Rotary to translational motion)	a1 &a3
9	- Performance and testing techniques.	a1 &a2
10	- Design of mechatronic system using programmable controllers.	a1 &c2
11	- Sensors such as: Position – velocity – acceleration – Force.	b1&d2
12	- Actuators such as : Hydraulic – Piezelectric – Electrodynamic.	c2&b5
13	- Modeling and simulation of dynamic systems. - Data acquisition systems – Fluid level control	c2&b5
14	- Robotic applications - Robotic manipulators.	c2&d2
15	- Discussion on some selected papers in the field.	d3&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	a1,a3,a4,b1.b5,c1,c2	a1,a3,a4,b1.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):

- Horowitz "Art of electronics," Cambridge university Press (1989).

- Recommended books

1- . **Cetinkunt , Mechatronics , 3rd edition, John Willy, 2007.**

2- Godfrey onwubolu, Mechatronics Principles and Applications , 2004.

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.

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Computer Aided Design (CAD)**
Course Code:	**PRE 704**
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.**	*Ph D*
5	**Pre-requisites course.**	**None**
6	**Pre-requisites by Topic**	**None**
7	**Coordinator**	**Dr Mohamed Asy**
8	**External Evaluator(s)**	

B- PROFESSIONAL INFORMATION:

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

Introduction & Principles of CAD – Design process & analysis – Design programs – Computer aided drawing – Curve design by computer – Multi – Parameter optimum design – 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%	20%	30%	30%	10%	100%

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of an introduction to CAD and 2D Computer Aided drawing and using AutoCAD and 3D drawing using sketch up. Students will learn to use the programs in many different ways and start to develop techniques that improve their speed and accuracy.

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 computer and mechanical design technology in computer aided design	a1.1. Define the basic concepts of computer aided design and their applications in mechanical design techniques.
	A4. Understand the moral and legal principles of professional practice in computer aided 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 computer aided 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 computer aided design of a machine components based on different criteria of the material and dimensions for solving design problems ..
	B5. Make career decisions in the light of available computer aided 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 computer aided design considerations in the field of specialization.	c.1.1. use the professional design considerations related to computer aided 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 computer aided design.
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	Introduction	b1.1, b5.1, c1.1,c2.1, d4.1
2	Principles of CAD	a1.1, b1.1, b5.1, c1.1,c2.1
3	A general CAD Systems	a4.1, b1.1, b5.1,
4	Describe the design process	a1.1, b5.1, c1.1,c2.1, d4.1,d7.1
5	Basic CAD process practices	a1.1, a4.1, b1.1, b5.1, c1.1,c2.1, d7.1
6	Analysis of CAD Processes	a4.1, b1.1, b5.1, c1.1, d4.1,d7.1
7	Design programs	a1.1, b1.1, b5.1, c1.1, d4.1
8	Computer aided drawing	b1.1, b5.1, c1.1,c2.1, d7.1
9	Create 2D Models	a1.1, a4.1, b1.1, b5.1, c1.1
10	Create 3D Models	b5.1, c1.1,c2.1, d7.1
11	Curve design by computer	a1.1, c1.1,c2.1, d7.1
12	Multi – Parameter optimum design	a1.1, a4.1, b1.1, b5.1, c1.1,c2.1, d7.1
13	Optimization and Optimal Design by CAD	a1.1, a4.1, b1.1, c2.1, d7.1
14	Case studies.	b1.1, b5.1, c1.1,c2.1, d7.1
15	Revision	a4.1, b1.1, b5.1, c1.1,

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1, a4, b1, b5, c1,c2**,** d4,d7	a1, a4, b1, b5, c1,c2**,** d4,d7

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**,** d4,d7	a1, a4, b1, b5, c1,c2**,** d4,d7

Weighting of assessments:

B.8. *List of References:*

Essential books (text books):

- Anupam Saxena, Birendra Sahay, Computer Aided Engineering Design, Anamaya Publishers, 2005, New Delhi, India

Periodicals, Web sites, Course notes, etc:

www.journals.elsevier.com/**computer-aided-design**

Journal of Computer-Aided Molecular Design

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

Dr Mohamed Asy

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 5 Feb. 2012

MinoufiyaUniversity,

Faculty of Engineering,

Post Graduate Studies and Research

COURSE SPECIFICATION

Course Title:	Computer Integrate Manufacturing (CIM)
Course Code:	PRE 705
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	3cr-hrs
2	Exam. Hours	3 hrs
3	Contact Hours	Lecture: 3 hrs/week | Lab: - 0 hrs/week
3	Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs.)	Production Engineering and Mechanical Design
4	Level at which this course is offered.	P.HD
5	Pre-requisites course.	None
6	Pre-requisites by Topic	None
7	Coordinator	Prof. Dr. Mahmoud Hewidy
8	External Evaluator(s)	Prof.

B- PROFESSIONAL INFORMATION:

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

Definition of computer integrated manufacturing (CIM)-objectives-communications-network structure-fields of applications-frame works-applications of microcomputers in control and manufacturing process-control system zone-direction of line computer control-different applications.

Course Subject Area:

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

10%	**30%**	**20%**	**30%**	**10%**	**100%**

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

The objective of this course is to provide the student with the utilization of the computer not only to automate the design,control,assembly,and planning,but also to link these processes into an organizational entity. Furthermore, this course controls of information flow and material or product flow to best serve the costumer.

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,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 manufacturing before computer, problems, defects and costs	a-1-1) Shortage associated with conventional methods compare to the presence of automation.
	A-2 Know the scientific progress in the different fields of manufacturing engineering	a-2-1) Benefits gained through the updating of the controlled machines.
Intellectual skills	B-1) Network structure- aims, types, advantages, limitations.	b-1-1) Selection of the suitable type of networks.
	B-5) Evaluate the optimum group technology through different choices.	b-5-1) Able to assess and solve the distribution of the machines and process
Professional skills	C-3) Assessment of the technical problems and selection of suitable robot FMS.	c-3-1) Able to assess the restriction and risks of conventional methods compare to robot and FMS.
	C-4) Evaluate and analyze the engineering problem in FMS, FMC and robot.	c-4-1) Define, analyze the engineering problem to start to assess the specification of industrial robot ad construction of FMS, FMC.
General skills	D-2) Using all available data and information technology related to the CIM topics.	d-2-1) Apply all technical information to assess the CIM topics (FMS, FMC, robot, GT).

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

Week No.	Contents	ILOs covered by this topic
1	Historical background of (CIM) -focuses on the computer for production-control-quality-maintenance-processing-design and material handling	a-1-1, a-3-1, b-2-1, c-3-1,c-4-1, d-2-1.
2	Communications and network structure:- local area network (LANs) – network architectures – star type – ring type – bus type . manufacturing automation protocol (MAP) .	a-1-1, b-2-1, b-5-1, c-3-1, d-2-1
3	Application one :- use of computer hardware , software and communications networks in all aspects of manufacturing – CNC :- definition-advantages	a-3-1, b-2-1, b-5-1, c-3-1,c-4-1, d-2-1.
4	G code-programing example-case study	a-3-1, b-2-1, b-5-1, c-3-1,c-4-1, d-2-1.
5	Application two:- Flexible manufacturing cell (FMC) Definition-elements-characteristics-costs-comparison to other different automated manufacturing systems	a-1-1, a-2-1, b-2-1, c-3-1,c-4-1, d-2-1,
6	Application three :- flexible manufacturing system :integrated approach to automating the production system (FMS) : subsystems of (FMS) scope of (FMS)	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
7	Comparison(FMS) to other types of manufacturing approaches – flexible transferee lines – benefits – material handling	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
8	Application four:- industrial robot – definition – reasons for using robots – classification of robots –coordinate system –degree of freedom .	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
9	Robot programing –components of robot –end effectors –sensors-applications.	a-1-1, b-2-1, b-5-1, c-3-1,c-6-1, d-2-1.
10	Application five :- microprocessor : application of micro computers of control and manufacturing processes as a basic central processing unit to control some manufacturing processes – PLC .	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1, d-2-1.
11	Application 6 :- group technology (GT) –definitions – reasons of adopting GT – benefits – applications – factors preventing widespread	a-1-1, a-2-1, b-3-1,c-6-1, d-2-1.
12	Applications of flow of parts using GT in some manufacturing processes to get the benefit of this technology – structure of polycode	a-1-1, a-2-1, b-2-1, c-3-1,c-6-1, d-2-1, d-4-
13	Application 7 :- artificial intelligence in manufacturing – definition – applications – artificial vision	a-1-1, a-2-1, b-5-1, c-3-1,c-6-1, d-2-1
14	Application 8 :- production planning and control – definition – objectives – basic elements and frame work of the modern production planning and control system – material requirements – product structure	a-1-1, a-2-1, b-2-1, b-5-1, c-3-1,c-6-1 d-4-1
15	Case study	a-1-1, a-2-1, b-2-1, b-3-1, c-3-1,c-6-1

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

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

B. 7. *Assessments:*

Student assessment methods:

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

Weighting of assessments:

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

B.8. *List of References:*

Essential books (text books):

"Automation Production Systems, and Computer-Aided Manufacturing" – Mikell P . Groover. PRENTICE-HALL. 1980.

13.3- Recommended books

"CAD-CAM-CIM" , P.RADHAKRISHNAN , S.SUBRAMANYAN , V.RAJU ,. (NEW AGE INTERNATIONAL PUBLISHERS 2008

Periodicals , Course notes, etc:

1. Robotics and computer integrated manufacturing –journal- Elsevier.
2. International journal computer integrated manufacturing.

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

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

1. A lecture room with LCD or data show

Course coordinator

Prof. Mahmoud Hewidy

Head of Dept.

Prof. Taha Ali El-Taweel

Date-- 1 /12/ 2013

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

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Tribology**
Course Code:	**PRE 706**
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.**	**Ph.D.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Dr. Gaber M. SHEHA**	
8	**External Evaluator(s)**	**Prof.**	

B- PROFESSIONAL INFORMATION:

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

Introduction & history background – Tests of oils & grease – Dry & lubricated ways – Surface topography & Modern models of surfaces contact mechanics – Test methods of tribology elements - Dry friction – variables affecting friction.

Course Subject Area:

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

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

The objective of this course is to build the capacities of the students to conduct quantitative research of Tribology & to represent significant results of recent researches . As well as , this course will give the students the required skills for modeling the engineering problems dealing with mechanical 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	A1, A2 & A3	B1, B3 & B4	C1, C3	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Understand & know theories, principles, & updated as well as novel topics in Tribology.	a-1-1) Define the behaour Tribology of engineering materials.
	A-2) Know, principles, appoaches, and morality of the scientific researches & its tools.	a-2-1) Describe some models to creating a desired Tribology model.
	A3-)Know & understand moral & legal principles of professional practice in Tribology.	a-3-1) Dicuss different techniques for solving some Tribology problems by programming.
Intellectual skills	B-1) Analyze and evaluate Tribology information.	b-1-1) Able to use evaluate methods to advance Tribology theory and profession.
	B-3) Perform research studies which can add to the Tribology knowledge.	b-3-1)Organize and interpret numerical data using computer programs to analyze the Tribology problems.
	B-4) Formulate scientific papers.	b-4-1) Able to quantify predicted results, and write a scietific reports & papers.
Professional skills	C-1) Perfect the basic and up-to-date professional skills in Tribology.	c-1-1) Employ a suitable techniques to develop required Tribology parameters related to machine design.
	C-3) Evaluate & develop methods & tools applied in Tribololgy.	c-3-1) Able to evaluate group of data collectors in the field of Tribology.
General skills	D-3) Teach others & evaluate their performance.	d-3-1) Able to design a teach programs for others & evaluate thim.

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Introduction & history background.	a-1-1, a-2-1,a-3-1, b-1-1,b-3-1, b-4-1, c-1-1
2	Surface tobography & modern models of surfaces contact mechanics	a-1-1, a-2-1,a-3-1, b-1-1,b-3-1, b-4-1, c-1-1
3	Herz Equation & contact stress.	a-1-1, a-2-1,a-3-1, b-1-1, b-3-1,b-4-1, c-1-1
4	Mechanics of sliding motion.	a-1-1, a-2-1,a-3-1, b-1-1, b-3-1,b-4-1, c-1-1, c-3-1, d-2-1
5	Tribology behaviour.	a-1-1, a-2-1,a-3-1, b-3-1, b-4-1, c-1-1, c-3-1, d-2-1
6	Friction & there affecting variables.	a-1-1, b-3-1, b-4-1, c-1-1, c-3-1,
7	Metallic & non-metallic anti- friction materials.	a-1-1, b-3-1, b-4-1, c-1-1
8	Case studies related mechanical design.	a-1-1, b-3-1, b-4-1, c-1-1
9	Wear phenomena & types.	a-1-1, b-3-1, b-4-1, c-1-1
10	Parameters affecting on wear rate.	a-1-1, b-3-1, b-4-1, c-1-1
11	Wear reduction methods.	a-1-1, b-3-1, b-4-1, c-1-1
12	Lubrication types.	a-1-1, b-3-1, b-4-1, c-1-1
13	Hydrodynamic Lubrication .	a-1-1, b-3-1, b-4-1, c-1-1
14	Boundary Lubrication .	a-1-1, b-3-1, b-4-1, c-1-1
15	Case studies of lubrication in mechanical design .	a-1-1, b-3-1, b-4-1, 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, a-2, a-3,b-1, b-3, b-4, c-1, c-3, d-2,	a-1, a-2, a-3,b-1, b-3, b-4, c-1, c-3, d-2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a-2, a-3,b-1, b-3, b-4, c-1, c-3, d-2	a-1, a-2, a-3,b-1, b-3, b-4, c-1, c-3, 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. Czichos,H., " Tribology –A system approach to the science and technology of friction, lubriction and wear ". N.Y Elsevier,1988.
2. Schey,J.A." Tribololgy in Metal working – Friction, Lubrication & Wear ", Metals Park, Ohio, ASM,1993.
3. Szeri A.Z. " Tribology – Friction. Lubrication & Wear " Mc Graw Hill Book Company , New York,1980.
4. Communicate with NET.

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) or any other package for Tribology .
2. A lecture room with LCD or show

Course coordinator

Dr. Gaber M. Sheha

Head of Dept.

Prof. Dr. Taha Ali El- Taweel

Date-- 5 Feb. 2012

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Scheduling**
Course Code:	**PRE 707**
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.**	**Ph.D.**	
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:*

Complexity of the scheduling problem - Optimum results for single machine scheduling - Johnson's algorithms for the two-machine flow shop - Johnson's algorithms for the two-machine general flow shop - and Johnson's algorithms for the special three-machine flow shop - Algorithms for the multiple-machine flow shop problem - Job shop scheduling dispatching rules - Scheduling issues in service industries

Course Subject Area:

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

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

The main objective of this course is to enhance the student background with a broad range of scheduling problems that arise in both manufacturing and service organizations, and to teach scheduling techniques, starting from basic principles, and leading to algorithms and computerized scheduling systems.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B1, B2	C3, C4	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1. Understand and know theories, principles, and updated as well as novel topics in production engineering specializations and the related fields.	a1-1) Classify scheduling problems a1-2) Demonstrate an understanding of the scheduling problems characteristic
	A2. Know principles, approaches, and morality of the scientific research and its tools.	a2-1)Recognize complexities associated with scheduling problems a2-2) Demonstrate through understanding of different methodology for solving scheduling problems
Intellectual skills	B1. Analyze and evaluate production engineering information.	b1-1) Use methods and techniques that are available for building scheduling systems in different manufacturing systems b1-2) Analyze the results of software packages that are designed to solve scheduling problems
	B2. Solve engineering problems based on the data available and possibly contradicting information.	b2-1) Select appropriate techniques to model and solve specific scheduling problem b2-2) Modeling and solving machine scheduling problems
Professional skills	C3. Evaluate and develop methods and tools applied in production engineering.	c3-1) Solve practical scheduling problems Apply and evaluate the different capabilities of different solution approaches
	C4. Use technology to serve the professional practice.	c4-1) Demonstrate capabilities in using software packages to solve scheduling problems
General skills	D2. Use information technology to serve the development of professional practice.	d2-1) Use software packages to solve practical problems

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Scheduling problems: Modeling and notations	a1-1, a1-2
2	Computational complexity - P, NP, NP-completeness	a1-2, a2-1
3	Single machine Models, Optimal schedules, Exact algorithms	a1-2, a2-2, b1-1
4	Single Machine Models: Weighted Completion Time, Maximum Lateness. Priority Rules	a2-2, b1-1
5	Single Machine Models: Preemption, Release Dates, Precedence	a2-2 , b1-1
6	Generalization of Maximum Lateness. Approximation Algorithm for Models without Preemption	a1-2, a2-2, b1-1
7	Johnson's algorithms for the two-machine flow shop	a1-2, a2-2, b1-1
8	Johnson's algorithms for the two-machine flow shop	a1-2, a2-2, b1-1
9	Johnson's algorithms for the special three-machine flow shop	a1-2, a2-2, b1-1
10	Algorithms for the multiple-machine flow shop problem	a1-2, a2-2, b1-1, c3-1
11	Algorithms for the multiple-machine flow shop problem	a1-2, a2-2, b1-1, c3-1
12	Job shop scheduling dispatching rules	a1-2, a2-2, b1-1, c3-1
13	Job shop scheduling dispatching rules	a1-2, a2-2, b1-1, c3-1
14	Scheduling issues in service industries	a1-2
15	Applications Using Microsoft Excel, Lekin system to solve scheduling problems	b1-2, c4-1, d2-1

B. 6. *Teaching and Learning Methods:*

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Lectures	a-1, a1-2, a2-1, a2-2, b1-1, b2-2, c3-1, c4-1, d2-1	A1, A2,B1, B2, C3, C4,D2

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a1-2, a2-1, a2-2, b1-1, b2-2, c3-1, c4-1	A1, A2,B1, B2, C3, C4

Weighting of assessments:

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

B.8. *List of References:*

Essential books (text books):

Pinedo, M., Scheduling – Theory, Algorithms, and Systems, 2nd edition, 2002, Prentice-Hall Inc, Pearson Education

Recommended books

Principles of Sequencing and Scheduling, K. Baker and D. Trietsch, Wiley, 2007

Planning and Scheduling in Manufacturing and services, M. L. Pinedo, 2005, Springer

Periodicals, Web sites, Course notes, etc:

LEKIN® – Flexible Job-Shop Scheduling System
http://community.stern.nyu.edu/om/software/lekin/

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

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

Course coordinator

Dr. Omayma Nada

Head of Dept.
Prof. Taha El-Taweel

Date : / /

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	***Abrasive machining methods***
Course Code:	***PRE*** 708
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.**	Ph.D	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. Mahmood Hewedi**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

Introduction - Theory of abrasive machining - Wear and Frictions Theories - Abrasive machining methods - grinding – honing – tapping – Blasting - Super finishing USM – AFM- Other new techniques.

Course Subject Area:

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

B.2. *Course Objectives:*

The objective of this course is to 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 and details of abrasive machining processes.

2.Definition of the requirements of abrasive machining equipments associated with different applications taking into considerations the strong relation between tribology and abrasive machining processes.

3.Realizing of the different types of abrasive machining equipments and the different machining processes.

4. Evaluation of the suitable production schemes for various abrasive machining equipments.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A2	B2, B3	C2,C3	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Understand and know theories, principles, and updated as well as novel topics in production engineering specializations and the related fields.	a1.1. Explain different abrasive machining methods using knowledge of basic engineering concepts.
	a2. Know principles, approaches, and morality of the scientific research and its tools	a2.1- Realize the recent research contribution in the Production Engineering
Intellectual skills	b2. Solve engineering problems based on the data available and possibly contradicting information.	b.2.1. construct and formulate problem solving scenarios in abrasive manufacturing problems and mechanical engineering based on the data available and possibly contradicting information.
	b3. Perform research studies which can add to the production engineering knowledge. .	b.3.1 Read and analyze researches and topics related to abrasive machining methods using standards, Journal papers, conference papers and recent published book chapters.
Professional skills	c2. Write and evaluate professional reports..	c2.1. Write and evaluate professional reports about novel points
	c3. Evaluate and develop methods and tools applied in production engineering..	c3.1-Evaluate the research contribution in the Production Engineering field. c3 .2-Develop suitable approaches to enhance the Production Engineering researches.
General skills	. d2. Do self-evaluation and continuous learning	d2-1) Use software packages to solve practical problems

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

Week No.	Contents	ILOs covered by this topic
1	Introduction to abrasive machining processes	a1.1, a2.1, c2.1, d5.1
2	Theory of abrasive machininig,tribolgical principles	a1.1, a2.1, b2.1, b3.1, d4.1,d5.1
3	Theory of abrasive machininig,tribolgical principles	a1.1, c2.1,c3.1, d4.1,d5.1
4	Theory of abrasive machininig,tribolgical principles	a1.1, a2.1, b3.1, c2.1,c3.1, d2.1
5	Wear and frictions theories	a1.1, a2.1, b2.1, b3.1, c2.1,c3.1, d4.1,d5.1
6	Wear and frictions theories	a1.1, a2.1, b2.1, b3.1, d2.1
7	Wear and frictions theories	a1.1, a2.1, b2.1, b3.1, c2.1,c3.1, d4.1,d2.1
8	Case study	b2.1, b3.1, c2.1,c3.1
9	Abrasive machining methods (grinding)	b2.1, b3.1, c2.1, d5.1
10	Abrasive machining methods (grinding)	b3.1, c2.1,c3.1, d2.1
11	Abrasive machining methods(honing)	a1.1, a2.1, b2.1, b3.1, c2.1,c3.1, d2.1
12	Abrasive machining methods(taping)	a1.1, a2.1, b2.1, b3.1, c2.1,c3.1
13	Abrasive machining methods(blasting, super finishing)	a1.1, a2.1, c2.1, d2.1
14	Abrasive machining methods (USM,AFM and other new techniques)	a1.1, a2.1, b2.1, c2.1,c3.1, d2.1
15	Abrasive machining methods (USM,AFM and other new techniques)	b2.1, b3.1, c2.1,c3.1

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

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Assignments and Exercises	a1, a2, b2, b3, c2,c3, d4,d5	a1, a2, b2, b3, c2,c3, d4,d5

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

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1, a2, b2, b3, c2,c3, d4,d5	a1, a2, b2, b3, c2,c3, d4,d5

Weighting of assessments

B.8. *List of References:*

Essential books (text books):

- Ioan D. Marinescu, W. Brian Rowe, Boris Dimitrov and Ichiro Inasaki "TRIBOLOGY OF ABRASIVEMACHINING PROCESSES" Library of Congress Catalog Card Number: 2004002376 United States of America by William Andrew, Inc. 2004

- Tlusty, G. (1999). *Manufacturing Processes and Equipment*. Upper Saddle River, NJ: Prentice-Hall.

- Kaczmarek, J. (1976). *Principles of Machining by Cutting, Abrasion, and Erosion.* Stevenage, U.K.: Peter Peregrines, Ltd. .

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

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. Mahmood Hewedy

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:	**Total Quality Control**
Course Code:	**PRE 709**
Department Offering the Course:	**Production Engineering**
Last Date of Approval:	**/ /20**

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**	
4	**Level at which this course is offered.**	**Ph.D.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Assoch. Prof. Mohamed Sharaf El-Din**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

Advanced treatment of quantitative research and analysis methods and their application to quality control research.

Course Subject Area:

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

B.2. *Course Objectives:*

The objective of this course is to 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. Design a quality control system, and collect primary data;
2. Be able to present and analyze data; and
3. Have hands on both parametric and non-parametric statistics, and the ability to read results and take the required corrective actions.

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,C6	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Understand, discuss, evaluate advanced theories, methods and models, and their applications on quality control	a-1-1) Use quantitative methods to test hypotheses and their applications on quality improvement
	A-2) Has hands on concepts, principles, ethics and tools of scientific inquiry	a-1-2) Prove the ability to use statistics ass a tool of applied architectural research
Intellectual skills	B-1) Has to prove his/her ability to apply technical knowledge to analytical actions in an attempt to advance the field of architecture and urban planning through contributions to the theory and praxis	b-1-1) Able to use quantitative methods of inquiry to advance architectural theory and profession
	B-4) Has to prove his/her abilities to assess and predict outcomes of proposed and recommended interventions using various techniques, such as Benefit/Cost (B/C) ratio, Cost/Effectiveness (C/E) ratio, Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), etc.	b-4-1) Able to quantify predicted results, and assess impacts using mathematical methods and models
Professional skills	C-1) Develop own skills through critical self-assessment to make proper career choices.	c-1-1) Able to assess limitations and opportunities to decide on career movement
	C-6) Able to command, lead, advise a group data collectors in the field	c-6-1) Able to lead group of data collectors in the field
General skills	D2. Use information technology to serve the development of professional practice.	d2-1) Use software packages to solve practical problems

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

Week No.	Contents	ILOs covered by this topic
1	Quality Improvement in the Modern Business Environment.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
2	Modeling Process Quality.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
3	Inferences about Process Quality.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
4	Methods and Philosophy of Statistical Process Control.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1, c-6-1, d-3-1, d-6-1
5	Process and Measurement System Capability Analysis.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1, c-6-1, d-3-1, d-6-1
6	Univariate Statistical Process – Monitoring and Control Techniques.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1, c-6-1, d-3-1, d-6-1
7	Univariate Process Capability Analysis.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
8	Mulitivariate Process Monitoring and Control.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
9	Mulitivariate Process Capability Analysis.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
10	Engineering Process Control and Statistical Process Control.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
11	Lot-by-Lot Acceptance Sampling for Attributes.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1
12	Other Acceptance Sampling Techniques.	a-1-1, a-1-2, b-1-1, b-4-1, c-1-1

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

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

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

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a-1, a-2, b-1, b-2, b-3, c-1, c-6, d-2	a-1, a-2, b-1, b-2 b-3, c-1, c-6, 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. Jerry Banks, "Principles of Quality Control", John Wiley & Sons, New York, NY, 1989.
2. Doglas C. Montgomry, "Introduction to Statistical Quality Control", 5th. Ed., John Wiley & Sons, Inc., 2005.
3. Bailey, Kenneth, Methods of Social Research, The Free Press, New York, NY, 1984.

Periodicals, Web sites, Course notes, etc:

1. Quality Technology & Quantitative Management, **http://www.cc.nctu.edu.tw/~qtqm/** or **http://web.it.nctu.edu.tw/~qtqm/**
2. What is Quantitative Research? http://www.marketresearchworld.net/index.php?option=com_content&task=view&id=11&Itemid=64
3. Ouyang , R., Basic Inquiry of Quantitative Research, http://ksumail.kennesaw.edu/~rouyang/ED-research/details.htm

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

Indicate requirements for the course including size of classrooms (i.e.; classrooms, 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

Assoc. Prof. Mohamed Sharaf El-Din

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:	***Multiple Objective Programming***
Course Code:	***PRE 710***
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.)***	***Doctor of Philosophy in Production Engineering***
4	***Level at which this course is offered.***	***Level 700***
5	***Pre-requisites course.***	***None***
6	***Pre-requisites by Topic***	***Linear and nonlinear Programming***
7	***Coordinator***	***Dr.***
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 multiple objective programming, Contexts that Give Rise to Multiple Objectives, Standard Multi-Objective Problems , Counter-balance for Bias .Also, Multiple objective models , Statistical Learning Tasks that Give Rise to Multiple Objectives. Goal programming, Case studies., General Setup for Applications,

Course Subject Area:

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

B.2. *Course Objectives:*

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

1. Understand the advanced treatment of multiple objective programming.
2. Describing the Statistical Learning Tasks that Give Rise to Multiple Objectives

3. Be able to Draw and analysis the problems of Contexts that Give Rise to Multiple Objectives, Standard Multi-Objective Problems and Counter-balance for Bias problems..
4. Be able to analyze Goal programming, Case studies and General Setup for Applications.

B.3. Relationship between the course and the programe

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3,A5	B1,B2,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) Understand and know theories, principles, and updated as well as novel topics in Multiple Objective Programming used in production engineering specializations and the related fields.	a-1-1) Identify and formulate the technical problems of MOP and suggest innovative solutions.
	A-3) Know and understand moral and legal principles of professional practice in advanced treatment of MOP program in production engineering.	a-3-1)Take the proper and precise decision based on the available Statistical Learning Tasks data.
	A-5) Know and understand knowledge of the detrimental impact of production engineering solution on Standard Multi-Objective Problems and the ways of its development and preservation as well.	a-5-1) Display professional responsibilities in the field of quality of products using Multi-Objective Problems methods.
Intellectual skills	B-1) Analyze and evaluate production engineering information using goal programming .	b-1-1) Employ the available resources efficiently and search continuously for new resources in the field of advanced treatment of multiple objective programming.
	B-2) Solve engineering problems based on the data available using advanced treatment of multiple objective programming.	b-2-1) Apply the analytical approaches of MOP in production engineering specialization and the related fields.
	B-3) Perform research studies of advanced treatment of multiple objective programming which can add to the production engineering knowledge.	b-3-1) Be committed to continuous self-development and transfer his experience and knowledge in this field to the others.
Professional skills	C-1) Perfect the basic and up-to-date professional skills in Multiple objective models to solve the problems of production engineering.	c-1-1) Show deeply awareness of the production problems and up-to-date theories in production engineering fields.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C-2)Write and evaluate professional report using General Setup for Applications of advanced treatment of multiple objective programming.	c-2-1)Be committed to continuous self-development and transfer his experience and knowledge to the others to prepare professional reports
General skills	D-2) Use information technology to serve the development of professional practice and applications in the related fields.	d-2-1) Apply the analytical approaches of MLP in production engineering specialization and the related fields.

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

Week No.	Contents	ILOs covered by this topic
1.	Introduction to multiple objective programming,	a-1-1,a-3-1, b-1-1, b-3-1, c-1-1
2.	advanced treatment of multiple objective programming,	a-1-1, b-1-1, b-2-1, , c-1-1,c-2-1
3.	Application on some of multiple objective programming,	a-1-1,a-3-1,a-1-5, b-1-1, b-2-1, , c-1-1,c-2-1
4.	Contexts that Give Rise to Multiple Objectives,	a-1-1, b-1-1, b-3-1, , c-1-1,c-2-1
5.	Application on some programming of Contexts that Give Rise to Multiple Objectives,	a-1-1,a-3-1,a-1-5, b-1-1, b-2-1, , c-1-1,c-2-1
6.	Draw and analysis the problems about the Contexts that Give Rise to Multiple Objectives,	a-1-1, b-1-1, b-3-1
7.	Standard Multi-Objective Problems,	a-1-1, b-1-1, b-2-1, , c-1-1,c-2-1
8.	Draw and analysis the problems about the Standard Multi-Objective Problems,	a-1-1, b-1-1, b-3-1
9.	Counter-balance for Bias,	a-1-1, b-1-1, b-3-1, , c-1-1,c-2-1
10.	Multiple objective models,	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
11.	Draw and analysis the problems about Multiple objective models,	a-1-1, b-1-1, b-3-1
12.	Statistical Learning Tasks that Give Rise to Multiple Objectives,	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
13.	Goal programming,	a-1-1, b-1-1, b-3-1, , c-1-1,c-2-1
14.	Case studies of General Setup for Applications,	a-1-1, b-1-1, b-3-1, , c-1-1,c-2-1
15.	General Application on multiple objective programming.	a-1-1, b-1-1, b-3-1, , 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.	*A1, A3,A5, B1,B2,B3,C1*	*A1, A3,A5, B1,B2,B3,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, A3,A5, B1,B2,B3	A1, A3,A5, B1,B2,B3,C1

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):

-Sourav Sahay, "Object-Oriented Programming with C++", Oxford University Press, ISBN10: 0-19-568152-5, Nov 2006.
-Yashavant Kanetkar, "Object Oriented Programming with C++", BPB Publications, ISBN: 8176568570, 2004.
-Nicolai M. Josuttis, "Object Oriented Programming in C++", John Wiley & Sons, ISBN: 9780470843994, December 2002.
-Herbert Schildt, "C++ from the ground up", Brandon A. Nordin, 2nd Edition, ISBN: 0-07-882405-2, November 1998.

Periodicals, Web sites, Course notes, etc:

- "ISO 9000 Quality Management System", International Trade Center, Geneva
- Kaoru Ishikawa, "Guide to Quality Control", Asian Productivity Organization, Tokyo.
- Andersson, J., \A survey of multiobjective optimization in engineering design," Technical report LiTH-IKP-R-1097, Department of Mechanical Engineering, Linkping University, Linkping, Sweden, 2000.

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.

Menoufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	***Nonlinear Programming***
Course Code:	***PRE 711***
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***	***Lecture3hrs/week.***
3	***Program(s) in which the course is offered.*** ***(If general elective available in many programs indicate this rather than list programs.)***	***Doctor of Philosophy in Production Engineering***
4	***Level at which this course is offered.***	***Level 700***
5	***Pre-requisites course.***	***None***
6	***Pre-requisites by Topic***	***linear Programming***
7	***Coordinator***	***Dr.***
8	***External Evaluator(s)***	***Prof. Dr……***

B- PROFESSIONAL INFORMATION:

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

Introduction to NLP – definitions and assumptions, formulating n lp problems. Solution approaches to unconstrained problems, solution approaches to constrained problems examples from different applications, graphical method for solving n lp problems, NLP standard form – conversion of NLP problems into standard form –basic solutions, simplex method, special cases, algorithms for solving constrained problems and case studie**s**

Course Subject Area:

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

B.2. *Course Objectives:*

1. Understand the methods and theories needed to solve Non-Linear Programming problems.
2. Learn the difference between methodologies used to solve Non-Linear programming problems.

3. Study the usage of Solution approaches to unconstrained problems.
4. Analyze and draw the Solution approaches to constrained problems mathematically.
5. Understand and draw algorithms for solving constrained problems.
6. Application and case study of the previous points.

B.3. Relationship between the course and the program

Field	National Academic Reference Standard (NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1, A3,A5	B1,B2,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) Understand and know theories, principles, and updated as well as novel topics in NPL used in production engineering specializations and the related fields.	a-1-1) Identify and formulate the technical problems of N LP and suggest innovative solution.
	A-3) Know and understand moral and legal principles of professional practice in advanced treatment of NL programs in production engineering.	a-3-1)Take the proper and precise decision based on the available Solution approaches to unconstrained problems.
	A-5)Know and understand knowledge of the detrimental impact of production engineering solution on Standard N LP and the ways of its development and preservation as well.	a-5-1) Display professional responsibilities in the field of quality of products using NLP methods.
Intellectual skills	B-1) Analyze and evaluate production engineering information using NPL.	b-1-1) Employ the available resources efficiently and search continuously for new resources in the field of advanced programming of NPL.
	B-2) Solve engineering problems based on the data available using advanced NP programming.	b-2-1) Apply the analytical approaches of NLP in production engineering specialization and the related fields.
	B-3) Perform research studies of advanced treatment of NP programming which can add to the production engineering knowledge.	b-3-1) Be committed to continuous self-development and transfer his/her experience and knowledge in this field to the others.
Professional skills	C-1) Perfect the basic and up-to-date professional skills in Solution approaches to unconstrained problems of NPL to solve the problems of production engineering.	c-1-1) Show deeply awareness of the production problems and up-to-date theories in production engineering fields.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C-2)Write and evaluate professional report using General Setup of algorithms for solving constrained problems.	c-2-1) Be committed to continuous self-development and transfer his experience and knowledge to the others to prepare professional reports.
General skills	D-2) Use information technology to serve the development of professional practice and applications in the related fields.	d-2-1) Apply the analytical approaches of NLP in production engineering specialization and the related fields.

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

Week No.	Contents	ILOs covered by this topic
1.	Introduction to NLP,	a-1-1,a-3-1, b-1-1, b-3-1, c-1-1
2.	Definitions And Assumptions of NLP,	a-1-1, b-1-1, b-2-1, , c-1-1,c-2-1
3.	Standard Formulating of N LP Problems,	a-1-1, b-1-1, b-2-1, , c-1-1,c-2-1
4.	Solution approaches to unconstrained problems,	a-1-1,a-3-1, b-1-1, b-3-1
5.	solution approaches to constrained problems,	a-1-1,a-3-1, b-1-1, b-3-1
6.	Examples From Different Applications,	a-1-1,a-3-1,a-5-1, b-1-1, b-3-1, c-1-1
7.	Graphical Method For Solving N LP Problems,	a-1-1, b-1-1, b-3-1
8.	Graphical Method For Solving N LP Problems,	a-1-1, b-1-1, b-3-1
9.	NLP Standard Form of Graphical Method,	a-1-1,a-3-1,a-1-5, b-1-1, b-2-1, , c-1-1,c-2-1
10.	Conversion Of NLP Problems into Standard Form,	a-1-1, b-1-1, b-3-1, , c-1-1,c-2-1
11.	Basic Solutions of different methods For Solving N LP Problems,	a-1-1,a-3-1, b-1-1, b-3-1
12.	Simplex Solutions of different methods For Solving N LP Problems,	a-1-1,a-3-1,a-1-5, b-1-1, b-2-1, , c-1-1,c-2-1
13.	Special Cases For Solving N LP Problems,	a-1-1, b-1-1, b-3-1, , c-1-1,c-2-1
14.	Algorithms for solving constrained problems,	a-1-1, b-1-1, b-4-1, , c-1-1,c-2-1
15.	Case studies in NPL applications.	a-1-1,a-3-1,a-1-5, b-1-1, b-2-1, , 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.	A1,A2,A3, B1,B2,B3, C1,C2	A1,A2,A3,B1,B2,B3,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,A2,A3, B1,B2,B3, C1,C2*	*A1,A2,A3,B1,B2,B3,C1,C2,D1*

B. 7. *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):

-D. Bertsekas , Nonlinear Programming: 2nd Edition. Athena Scientific. 1999

-David M.Himelblan, Applied Non-Linear Programming, Mc GrawHill, 1972

-Mokhtar S. Bazaraa, Non-Linear Programming Theory and Algorithms , JohnWiley &Sons Inc., 1993.

Periodicals, Web sites, Course notes, etc:

-http://www.stanford.edu/~boyd/cvxbook.html,

-http://en.wikipedia.org/wiki/Nonlinear programming,

- http://www-unix.mcs.anl.gov/otc/Guide/faq/nonlinearprogramming- faq.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

Dr. ABEER SOBHY EISA

Head of Dept.

Prof. Dr. Taha El-Taweel

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

Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Supply Chain Management**
Course Code:	**PRE 712**
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.**	**Ph.D.**	
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:*

Understanding SCM and its importance in the global market - SCM drivers - inventory problem – transportation - designing a SC network - information system

Course Subject Area:

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

B.2. *Course Objectives:*

The main objective of this course is presenting the concept of a supply chain as a complete system that begins with raw materials and delivers value to the end customer. The student will learn to use a variety of conceptual models to describe and classify supply chains In terms of how they are

designed and configured to maximize certain value, with the emphasis always being on the entire system rather than any individual component. The objective is also to recognize and correct supply chain designs that are mismatched to their environments and to direct attention to the critical elements that must be managed.

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, C3	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge & Understanding	A1. Understand and know theories, principles, and updates as well as novel topics in production engineering specializations and the related fields.	a1-1) Recognize the effect of supply chain management on the organization's competitiveness. a1-2) Explain various forecasting techniques. a1-3) Categorize the performance measures that are relevant to a supply chain. a1-4) Identify the key drivers of supply chain performance.
	A2. Know principles, approaches, and morality of the scientific research and its tools.	a2-1) Demonstrate familiarity with holistic thinking in SC decision making.
Intellectual skills	B1. Analyze and evaluate production engineering information.	b1-1) Evaluate the strengths and weaknesses of different modes of transportation. b1-2) Diagnose information integration problems across the supply chain and their consequent impacts in deploying physical and financial resources.
	B2. Solve engineering problems based on the data available and possibly contradicting information.	b2-1) Conceptualize supply chain designs, which are aligned with business models for manufacturing and service companies. b2-2) Solve supply chain models. a2-3) Demonstrate ability to integrate, co-ordinate, and synchronize activities of a supply chain.
Professional skills	C1. Perfect the basic and up-to-date professional skills in production engineering.	c1-1) Design supply chain contracts. c1-2) Manage inventory efficiently.

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	C3. Evaluate and develop methods and tools applied in production engineering.	c3-1) Appraise tradeoffs between cost and responsiveness in supply chains. c3-2) Compare the major applications of supply chain information technology.
General skills	D2. Use information technology to serve the development of professional practice.	d2-1) Determine the IT infrastructure requirements and IT integration strategy for supply chain management.

B.5. Syllabus to be Covered:

Week No.	Contents	ILOs covered by this topic
1	Introduction to Supply Chain Management	a1-1, a1-3, c3-1
2	Drivers of supply chain performance	a1-1, a1-3, a1-4
3	Network Planning/The Value of Information	a2-1,
4	Basics and Methods of SC Design	a1-3, b2-1, b2-2, c3-1
5	Design of Distribution Networks	a2-1, b2-2, a2-3, c3-1
6	Risk Management and Supply Chain Design	a1-3, b2-1, b2-2, c2-1
7	Inventory and Risk Management	c3-1
8	Demand forecast and Supply in SCs	a1-2
9	Inventory Management and Lot sizing	c2-1
10	Inventory Management and Safety Stocks	c2-1
11	Transportation Systems	b1-1
12	Supplier scoring and assessment	b2-2, c3-1
13	Supply Chain Contracts	c1-1
14	Supply Chain Integration	a2-1, b1-2, a2-3, c3-1
15	Role of information technology in a supply chain	b1-2, c3-2, d2-1

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

No.	Teaching and Learning Methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Lectures	a1-1, a1-2, a1-3, a1-4, a2-1, b1-1, b1-2, b2-1, b2-2, b2-3, c1-1, c1-2, c3-1, c3-2, d2-1	A1, A2 ,B1, B2, C1, C3, D2

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

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1-1, a1-2, a1-3, a1-4, a2-1, b1-1, b1-2, b2-1, b2-2, b2-3, c1-1, c1-2, c3-1, c3-2	A1, A2 ,B1, B2, C1, C3

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):

Simchi-Levi, David, Kamisnsky, Philip, and Simchi-Levi, Edith, Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies, 3rd Edition, Irwin/McGraw Hill, 2008.

Recommended books

Chopra , S. and Meindl, P. , Supply Chain Management by, Prentice Hall, 4th Edition, 2010

Periodicals, Web sites, Course notes, etc:

Journal of Supply Chain Management
http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1745-493X

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

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

Course coordinator

Dr. Omayma Nada

Head of Dept.
Prof. Taha El-Taweel

Date: / /

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

Minufiya University
Faculty of Engineering

COURSE SPECIFICATION

Course Title:	**Machine design**
Course Code:	***PRE 713***
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.**	*Ph D*	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Ass. Prof. Dr. Fawkiah Ramadan** **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%**	**20%**	**30%**	**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 design.
2. Definition of the requirements of machine design consideration.
3. Realizing the difference between different machine elements.

4. Analysis of different machine structures based on material, dimension and process selection criteria.
5. Analysis of different techniques for modeling the machine 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	d4,d7

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 design and their applications in production technology.
	a4. Understand the moral and legal principles of professional practice in machine 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 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 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 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 design.
General skills	d4. Use of different sources for information knowledge	d.4.1. Share the students to use different sources for information knowledge
	d7. Self- learning continuously.	d.7.1. Improve the ability of the students to Self- learning continuously

B.5. *Syllabus to be Covered:*

Week No.	Contents	ILOs covered by this topic
1	Fatigue	b1.1, b5.1, c1.1,c2.1, d4.1
2-3	Contact stresses	a1.1, b1.1, b5.1, c1.1,c2.1
4-5	Dynamic loading	a1.1, b5.1, c1.1,c2.1, d4.1,d7.1
6-9	Structure modification using higher order elements.	a1.1, a4.1, b1.1, b5.1, c1.1,c2.1, d7.1
10-12	Analysis and design of engineering systems	a1.1, a4.1, b1.1, b5.1, c1.1, d4.1,d7.1
13-15	Dynamic model updating using experimental data.	a1.1, a4.1, b1.1, b5.1, c1.1, d4.1,d7.1

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**,** d4,d7	a1, a4, b1, b5, c1,c2**,** d4,d7

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**,** d4,d7	a1, a4, b1, b5, c1,c2**,** d4,d7

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.
- Roark, Stress and strain formulas.
- P H Joshi, Machine Tools Handbook, Design and Operation,Tata Mc Graw-Hill, 2007.

Periodicals, Web sites, Course notes, etc:

- Machine tools design and research
- Machine design

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. Fawkiah Ramadan
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:	**Quality Control**
Course Code:	**PRE 714**
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.**	**Ph.D.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Accoch. Prof. Mohamed Sharaf El-Din**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

Advanced treatment of quantitative research and analysis methods and their application to quality control research.

Course Subject Area:

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

B.2. *Course Objectives:*

The objective of this course is to 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. Design a quality control system, and collect primary data;
2. Be able to present and analyze data; and

3. Have hands on both parametric and non-parametric statistics, and the ability to read results and take the required corrective actions.

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,C3	D1,D2, D4

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A-1) Understand and know theories, principles and updated as well as novel topics in production engineering specializations and the related fields.	a-1-1) Define the basic concepts of quality specifications and their applications on quality improvement
	A-2) Know principles, approaches, and morality of the scientific research and its tools.	a-2-1) Identify and analyze the different trouble causes on process to take the required corrective action.
Intellectual skills	B-1) Analyze and evaluate production engineering information.	b-1-1) Design an active control system to improve process quality.
	B-2) Solve engineering problems based on the data available and possibly contradicting information.	b-2-1) Formulate the required statistical models to solve the process quality problems.
Professional skills	C-1) Perfect the basic and up-to-date professional skills in production engineering. C-2) Write and evaluate professional reports.	c-1-1) Demonstrate some suitable solutions to reduce high variability in products. c-2-1) Develop some new report forms to control the quality.
	C-3) Evaluate and develop methods and tools applied in production engineering.	c-3-1) Use the computer graphics to construct the required process control charts.
General skills	D-1) Communicate effectively and work efficiently with multi-displinary teams. D-2) Use information technology to serve the development of professional practice.	d-1-1) Share to design questionnaires that collect data efficiently. d-2-1) Balance between quality and costs.
	D-4) Do self-evaluation and continuous learning.	d-4-1) Improve the performance level of manpower.

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

Week No.	Contents	ILOs covered by this topic
1	Quality Improvement in the Modern Business Environment.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
2	Quality Improvement in the Modern Business Environment, contd.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
3	Modeling Process Quality.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
4	Inferences about Process Quality.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1, c-3-1, d-2-1, d-4-1
5	Methods and Philosophy of Statistical Process Control.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1, c-3-1, d-2-1, d-4-1
6	Capability Analysis.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1, c-3-1, d-2-1, d-4-1
7	Process and Measurement System Capability Analysis.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
8	Univariate Statistical Process – Monitoring and Control Techniques.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
9	Univariate Statistical Process – Monitoring and Control Techniques, contd.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
10	Multivariate Process Monitoring and Control.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
11	Multivariate Process Monitoring and Control, contd.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
12	Multivariate Process Capability Analysis.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
13	Engineering Process Control and Statistical Process Control.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
14	Lot-by-Lot Acceptance Sampling for Attributes.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1
15	Other Acceptance Sampling Techniques.	a-1-1, a-2-1, b-1-1, b-2-1, c-1-1

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

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

B. 7. *Assessments:*

Student assessment methods:

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

Weighting of assessments:

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

B.8. *List of References:*

Essential books (text books):

1. Jerry Banks, "Principles of Quality Control", John Wiley & Sons, New York, NY, 1989.
2. Doglas C. Montgomry, "Introduction to Statistical Quality Control", 5th. Ed., John Wiley & Sons, Inc., 2005.
3. Bailey, Kenneth, Methods of Social Research, The Free Press, New York, NY, 1984.

Periodicals, Web sites, Course notes, etc:

1. Quality Technology & Quantitative Management, **http://www.cc.nctu.edu.tw/~qtqm/** or **http://web.it.nctu.edu.tw/~qtqm/**
2. Hopkins, Will G. Quantitative Research Design, http://www.sportsci.org/jour/0001/wghdesign.html
3. What is Quantitative Research? http://www.marketresearchworld.net/index.php?option=com_content&task=view&id=11&Itemid=64
4. Ouyang , R., Basic Inquiry of Quantitative Research, http://ksumail.kennesaw.edu/~rouyang/ED-research/details.htm

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

Accoch. Prof. Mohamed Sharaf El-Din

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:	**Production Engineering**
Course Code:	***PRE 715***
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.**	**Ph.D.**	
5	**Pre-requisites course.**	**None**	
6	**Pre-requisites by Topic**	**None**	
7	**Coordinator**	**Prof. M.Fattouh**	
8	**External Evaluator(s)**		

B- PROFESSIONAL INFORMATION:

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

This course focuses on the following:- Integrate practical knowledge on the Production Eng and Machining Processes .Gain research talent in electrical power systems. Up-to-date the present researches in the Production Eng and Machining Processes.

Course Subject Area:

Math. and Basic Sciences	Basic Eng. Science	Applied Eng. And Design	Computer application and ICT	Projects and practice	Total
10%	30%	20%	30%	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. Improve the self-learning in the Production Eng and Machining Processes.
2. Release the research talent in the Production Eng and Machining Processes.
3. Realize the editing roles for writing technical document.
4. Advance the technical presentation skills.
5. Realize the recent research contribution in the Production Eng and Machining Processes**.**

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, B9	C2,C3	D2

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

Field	Programme ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	a1. Understand and know theories, principles, and updated as well as novel topics in production engineering specializations and the related fields.	al.l- Recognize the novel approaches in the Production Engineering
	a2. Know principles, approaches, and morality of the scientific research and its tools.	a2.1- Realize the recent research contribution in the Production Engineering
	a4. Know the principles and fundamentals of quality in engineering.	a4.1- Recognize the quality principles in the Production Engineering researches.
Intellectual skills	b1.Analyze and evaluate production engineering information	bl.l- Read and analyze researches and topics related to Production Engineering using standards, Journal papers, conference papers and recent published book chapters.
	b9.Perform dialogue and debate based on evidence.	b9.1- Discuss the literature contents and results.
Professional skills	c2. Write and evaluate professional reports.	c2.1- Write and evaluate professional reports about novel points

Field	Programme ILOs that the course contribute in achieving	Course ILOs
	c3. Evaluate and develop methods and tools applied in production engineering.	c3.1-Evaluate the research contribution in the Production Engineering field. c3 .2-Develop suitable approaches to enhance the Production Engineering researches..
General skills	d3. Teach others and evaluate their performance..	d3.1- Present the collaborative work using power point.
	d4. Do self-evaluation and continuous learning.	d4.1-Evaluate his/her level of Knowledge and try to learn more
	d5. Use different sources to get information and knowledge.	d5.1- Use specialized books and related internet websites to prepare reports and presentations.
	d6. Use different sources to get information and knowledge.	d6.1- Cooperate with the colleagues to present collaborative work.

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

Week No.	**Contents**	**ILOs covered by this topic**
1	Introduce the course topics and decide a topic for each student.	al.l, a2.1, a4.1
2	Provide the topic materials: Standards, Journal papers, conference papers and recent book chapters. Discuss the outline of the topics.	al.l, a2.1, a4.1, bl.l,d2.1
3	Discuss the selected topics based on the provided materials.	bl.l,b9.1,d3.1, d2-1
4	Improve the student background on the selected topic by discussions and simulations.	bl.l, b9.1, c3.1, c3.2,d3.1
5	Continue: Improve the student background on the selected topic by discussions and simulations.	bl.l,b9.1,c3.1, c3.2,d3.1, d2.1
6	Continue: Improve the student background on the selected topic by discussions and simulations.	bl.l,b9.1,c3.1, c3.2,d2.1
7	A discussion on writing the corresponding technical report.	c2.1,d3.1,d2.1
8	Continue: A discussion on writing the corresponding technical report.	c2.1,d3.1, d2.1
9	Review the written report.	c2.1,d2.1
11	Review the presentation.	c2.1
12	Continue: Review the presentation.	c2.1
13	Present the report and presentation.	c2.1,d3.1,d2.1
14	Continue: Present the report and presentation.	c2.1,d3.1,
15	Continue: Present the report and presentation.	c2.1,d3.1,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, a2, a4,b1, b9, c2, c3, d3, d4, d5,d6	a1, a2, a4,b1, b9, c2, c3, d3, d4, d5,d6

B. 7. *Assessments:*

Student assessment methods:

No.	Assessment methods	To Assess Course ILOs Item No.	To Assess (ARSEP) Outcomes No.
1	Written exam	a1, a2, a4,b1, b9, c2, c3, d3, d4, d5,d6	a1, a2, a4,b1, b9, c2, c3, d3, d4, d5,d6

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. International conferences.
2. Practical manuals and standards.
3. Recent published books.

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. M.Fattouh

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:	**Failure Analysis**
Course Code:	**PRE 716**
Department Offering the Course:	**Production Engineering and Mechanical Design**
Last Date of Approval:	**2/11/2013**

A- COURSE IDENTIFICATION AND INFORMATION:

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

B- PROFESSIONAL INFORMATION:

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

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

Course Subject Area:

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

B.2. *Course Objectives:*

The objective of this course is to provide the student with means of analyzing the failure of mechanical components. The course also provides the student with required skills of detecting the critical sections in mechanical components in addition to the required skills of identifying types of failure of mechanical components.

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

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

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

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

B.5. *Syllabus to be Covered:*

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

B. 6. *Teaching and Learning Methods:*

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

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

13.3- Recommended books

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

Periodicals, Web sites, Course notes, etc:

1. Int. J of Failure Analysis.
2. Engineering Failure Analysis
3. Case Studies in Engineering Failure Analysis
4. www.gobookee.org

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

1. A lecture room with LCD or data show

Course coordinator

Prof. Al-Badarwy Abo El-Nasr

Head of Dept.

Prof. Taha El-Taweel

Date-- 2 November 2012