كلية الهندسة
College of Engineering

MECHANICAL and INDUSTRIAL ENGINEERING PROGRAM

جامعة المجمعة
Majmaah University

جامعة ال
University

COURSE SPECIFICATION USING THE NCAAA

Approval	
Department	College
Department Head Dr. Saleh Aldahash	Engineering Dean Dr Abdullah Abedalkareem
Minutes Number & date 25/1/1436 H	Signature
Signature	

Course Specifications

Muharram 1437 H

Institution:	Majmaah University
Academic Department :	**Mechanical and Industrial Engineering**
Programme :	**Basic Sciences**
Course :	**Fundamentals of Engineering Technology**
Course Coordinator :	Eng. Ziad Algezawi
Programme Coordinator :	Dr Saleh Aldahash
Course Specification Approved Date :	25 / 01 / 1436 H

This form compatible with NCAAA 2013 Edition

A. Course Identification and General Information

1 - Course title :	**Fundamentals of Engineering Technology**	Course Code:	GE 101
2. Credit hours :	(1.2)		
3 - Program(s) in which the course is offered:	Mechanical &industrial Engineering		
4 – Course Language :	English		
5 - Name of faculty member responsible for the course:	Eng. Ziad Algezawi		
6 - Level/year at which this course is offered :	Level 3, Second Year		
7 - Pre-requisites for this course (if any) : None			
8 - Co-requisites for this course (if any) : None			
9 - Location if not on main campus : Al-Yahya Buiding- Majmaah			

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	√	What percentage?	10%
D - e-learning	√	What percentage?	10 %
E - Correspondence		What percentage?	……. %
F - Other		What percentage?	……. %

Comments :

……

B Objectives

What is the main purpose for this course?

An understanding of the definition, necessary background and importance of the subject of Engineering Technology and Manufacturing Workshops, apply the basic terminology, concepts, principles and theories of it.

Briefly describe any plans for developing and improving the course that are being implemented :

- The course contents will be periodically reviewed by the instructors and the Undergraduate Committee to include new materials of relevance and improved teaching method.
- The course content will include health and safety procedures in the workshop

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction and health and safety in the workshop	1	2
Engineering materials Material Properties and Their Applications	2	4
Bench and Fitting Work	2	4
First mid exam	1	2
Metal Casting	2	4
Metal Forming (Deformation process	3	6
Method of Joint Metallica's	1	2
Machining Operations	1	4
Second midterm Exam	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**15**		**15**		**---**	**30**
Credit	**1**		**1**		**---**	**2**

3. Additional private study/learning hours expected for students per week. 3-4

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	**(i) Description of the knowledge to be acquired** **➢ Be familiar with different departments within the workshop,** **➢ Be able to layout workshops,** **➢ Be familiar with safety considerations,** **➢ Be acquainted with the classification, properties, and use of engineering materials,** **➢ Be able to use different measuring instruments and hand tools,** **Be Acquainted with the basic manufacturing processes**	**(i)Teaching strategies to be used to develop that knowledge** **➢ Lectures** **➢ Workshop lab.**	**(i) Methods of assessment of knowledge acquired** **➢ Tested by giving them three exams and two quizzes** **➢ Given homework assignments**
2.0	**Cognitive Skills**		
2.1	**(i) Description of cognitive skills to be developed** **➢ Students will be able to apply the fundamentals of engineering technology that they have learnt in this course in manufacturing simple works** **➢ For a given problem, they should be able to identify the correct method for production**	**(i) Teaching strategies to be used to develop these cognitive skills** **Lectures are followed by numerous examples for simple products** **Tutorials are used to explain further the**	**(i) Methods of assessment of students cognitive skills** **Homework assignments, exams, and quizs.**

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		workshop machines Engage students in classroom interaction with practice	
3.0	**Interpersonal Skills & Responsibility**		
3.1	**(i) Description of the interpersonal skills and capacity to carry responsibility to be developed** ➢ **Punctual attendance of classes and tutorials** ➢ **Student will take the responsibility to solve given assignments on their own and submit the solution on time.** ➢	**(i) Teaching strategies to be used to develop these skills and abilities** **Assignment is given to the students at regular intervals for them to solve and submit. 10% of the final grade is allocated to the assignments. Late or no submission of assignments carries penalties or loss of grade points.**	**(i) Methods of assessment of students interpersonal skills and capacity to carry responsibility** **Class attendance of students at the beginning of the lecture is recorded.**
3.2	➢ **Students learn to manage their time in self-study of the course of engineering technology**	**Participation of students in classroom discussion.**	**Recording of submission of assignment and the**

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
			grades.
4.0	Communication, Information Technology, Numerical		
4.1	Students have verified the procedure regarding the operation of a milling machine in the workshop regarding surface milling using end-mill tool and analyzed the the speed, depth of cut and the orientation of the milling table.	To enable students to give satisfactory skills on how to communicate and deliver the right information to the recipient.	Continuous follow-up by the instructor and continuous assessment.
4.2	With milling operation , students have explained and analyzed for different operations, the use of micrometer and Vernier caliper to obtain the right measurements.	To enable students how to use different measuring tools and machines	Intensive experiments to provide a good experience as if they where in real life.
5.0	Psychomotor Not Applicable		

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	During 6, 7 ,8th Weak	20%
2	Second Major Exam	During 12, 13, 14th Weak	20%

3	Final Exam	Final exam week	40
4	Quizzes (5)	**From week 3 to week 11**	5%
5	Homework assignments and lab work	**From week 3 to week 11**	15%
7	**Total**		**100%**

D. Student Academic Counseling and Support

a) Weekly office hours
b) Meetings and discussions on Blackboard/D2L

E. Learning Resources

1. List Required Textbooks :

- **- Required Text(s)); Singh, R. "Introduction to Basic Manufacturing Processes and Workshop Technology", 2006 New Age International (P) Ltd., Publisher**

2. List Essential References Materials :

- **- NA**

3. List Recommended Textbooks and Reference Material :
Scientific journals in the area (give exact titles)

4. List Electronic Materials :
(Lecture material in PPT)

5. Other learning material :

Not required

F. Facilities Required

1. Accommodation a- Classroom b- workshop
2. Computing resources. (AV, data show, Smart Board, software, etc.) ➢ **Proper projector system**
3. Other resources ➢ **NA**

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching: Course Evaluation Survey filled by students
2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor : Faculty Peer Assessment
3. Processes for Improvement of Teaching : 1. Plan: The instructor will develop a strategy for teaching. 2. Do: The strategy will be implemented for one semester. 3. Study: The experiences of the students will be collected through a survey. 4. Act: Effective teaching strategies will be implemented and revised as more experiences are gained.
4. Processes for Verifying Standards of Student Achievement. ➢ **Undergraduate Committee will review deficiencies based on the student evaluation, faculty input, course file, and program assessment.** ➢ **Feedback from employers and alumni surveys and graduating students' input are used to identify any deficiencies in students' ability in applying knowledge of engineering mechanics.** ➢ **Organize workshop on effective teaching methods to enable instructors to improve their teaching skill**
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

The Improvement Loop details the steps of course and program improvement. The course reports will be reviewed every two years by the Course Report Committee and the recommendations will be passed to the department council for review and possible adaptation.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Eng Ziad Algezawi	**Name :**	Dr. Saleh Aldahash
Signature :	*Ziad Algezawi*	**Signature :**	
Date :	25…./ …3 / …1437 H	**Date :**	**25/01/1437 H**

Institution:	College of Engineering
Academic Department :	Mech &Ind Engineering
Programme :	BS Mechanical Engineering
Course :	Dynamics (GE 108)
Course Coordinator :	Dr.Chandra Mouli
Programme Coordinator :	Head of The Department
Course Specification Approved Date :	25/01/1436

A. Course Identification and General Information

1 - Course title : Dynamics		Course Code: GE 108	
2. Credit hours : 03			
3 - Program(s) in which the course is offered: Mechanical, Industrial			
4 – Course Language : English			
5 - Name of faculty member responsible for the course: Dr. Chandra Mouli			
6 - Level/year at which this course is offered : 04			
7. Pre requisite: GE 103			
8 - Co-requisites for this course (if any) : • **No co-requisite**			
9 - Location if not on main campus :**College of Engineering, Majmaah**			
10 - Mode of Instruction (mark all that apply)			
A - Traditional classroom	x	What percentage?	95%
B - Blended (traditional and online)		What percentage?	
D - e-learning	x	What percentage?	5 %
E - Correspondence		What percentage?	
F - Other		What percentage?	
Comments Students can study the materials through Majmaah e learning system			

B Objectives

What is the main purpose for this course? ○ To introduce the basic concepts of dynamics as applied to particles and bodies. ○ To introduce different type of motions and governing equations and describe and predict the motion experienced by particle & bodies. ○ Understand the basic principles of 2D rigid body motion. ○ To study the effect of vibrations on different systems and governing equations of motion. ○ To develop analytical skills relevant to the above mentioned concepts.
Briefly describe any plans for developing and improving the course that are being implemented : **Teaching introductory classes on basic mathematics and motivating the students so that they would be able solve dynamics problems.**

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to Engineering Mechanics; Defining important terms	01	04
Kinematics of Particles : Rectilinear Motion	03	12
Kinematics of Particles : Curvilinear Motion	03	12
Kinetics of Particles : Newton's Second Law & Equations of motion	03	12
Kinematics of Rigid Bodies. Rotation and translation of a rigid body in the plane. General motion, Displacement, velocity, and acceleration of rigid bodies, including Coriolis motion. Motion about a fixed point. Equations of motion for a rigid body.	03	12
Work and energy. Impulse and momentum. Principle of Conservation of Energy.	01	04
Gyroscopic motion. Introduction to mechanical vibrations.	01	04

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15	0	0	0	60
Credit						03

3. Additional private study/learning hours expected for students per week.

02

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Understand the importance of Kinematics of a particle in rectilinear motion and apply on related problems.	Class Room	Mid Term/Final Exam
1.2	Select and use an appropriate coordinate system to describe particle motion	Class Room	Mid Term/Quiz/Final Exam
1.3	Understand and evaluate the importance of Kinematics of a particle in Curvilinear motion.	Class Room	Attendance/Quizzes/Home work/Final Exam
1.4	Evaluate Kinetics of a particle in motion relating Newton's Second Law & Equations of motion.	Class Room	Attendance/Quizzes/Home work/Final Exam
1.5	Evaluate the importance of Kinematics of a Rigid body in motion.	Class Room	Mid Term/Quiz/Final Exam
1.6	Evaluate the importance of Kinetics of a Rigid body in different motions.	Class Room	MidTerm/Quiz/Homework Final Exam
1.7	Apply the knowledge gained to solve practical problems involving dynamic forces and equilibrium.	Class Room	Mid Term/Quiz/Final Exam
1.8	Understand the basics of dynamics involved in various Engineering applications	Class Room	Mid Term/Quiz/Final Exam
2.0	**Cognitive Skills**		
2.1	Recognizing the applicability of laws of kinetics and kinematics in the field of engineering	Class Room	Examinations
2.2	Solving and analyzing complex dynamics problems for forces and motion	Class Room	Assignments, Term Exams and Final Exam
3.0	**Interpersonal Skills & Responsibility**		
3.1	Interpretation of the data and applying kinetic and kinematic principles for the given problems.	Homework	Revaluation
3.2	Participating in group discussions	Discussions	Interactive teaching
4.0	**Communication, Information Technology, Numerical**		
4.1	Defending the results and analysis of the assigned motion/force of problems	……	……
5.0	**Psychomotor**		
5.3	……	……	……
5.4	……	……	……
5.5	……	……	……
5.6	……	……	……

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Quiz 1	03	05 Points
2	Assignment/Homework	05	05 Points
3	Mid Term 1	07	20 Points
4	Quiz 2	10	05 Points
5	Mid Term2	11	20 Points
6	Assignment/Home work	12	05 Points
7	Final Exam	15	40 Points
	Total		100 Points

D. Student Academic Counseling and Support

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E. Learning Resources

1. List Required Textbooks : Hibbeler, R.C., Engineering Mechanics: Dynamics, Seventh Edition, Prentice Hall.
2. List Essential References Materials : Vector Mechanics for Engineers: Dynamics, by F. P. Beer, E. R. Johnston, and William E. Clausen, published by McGraw-Hill.
3. List Recommended Textbooks and Reference Material : Hibbeler, R.C., Engineering Mechanics: Dynamics, Seventh Edition, Prentice Hall.. Vector Mechanics for Engineers: Dynamics, by F. P. Beer, E. R. Johnston, and William E. Clausen, published by McGraw-Hill.
4. List Electronic Materials : **Majmaah university e learning website**
5. Other learning material : • Nil

F. Facilities Required

1. Accommodation • **Class room**
2. Computing resources • **Not required**
3. Other resources • **Majmaah University E learning access**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: • **Feedback is being taken by the Administrative department**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

• The existing system shall be continued
3 Processes for Improvement of Teaching : **Existing process will be continued**
4. Processes for Verifying Standards of Student Achievement **Existing process will be continued**
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement : • **Time to time it will be reviewed with Programme co ordinator**

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		**Department Head**	
Name :	Dr Chandra Mouli	***Name :***	.....
Signature :	.....	***Signature :***	.....
Date :	07/01/2016	***Date :***	…./ … / …… *H*

Institution:	Majmaah University.
Academic Department :	College of engineering/ Mechanical & industrial engineering.
Programme :	Mechanical & industrial engineering.
Course :	Mechanical Measurements (ME-111).
Course Coordinator :	Dr Shemy M. Ahmed.
Programme Coordinator :	Dr Saleh Aldahash. .
Course Specification Approved Date :	25/01/1436

A. Course Identification and General Information

1 - Course title : Mechanical Measurements.		Course Code: ME-111.	
2. Credit hours : 2			
3 - Program(s) in which the course is offered: Mechanical & industrial engineering			
4 – Course Language : English			
5 - Name of faculty member responsible for the course: Shemy M. Ahmed..			
6 - Level/year at which this course is offered : L 2/Second Year			
7 - Pre-requisites for this course (if any) : Workshop technology - GE 101.			
8 - Co-requisites for this course (if any) : NIL			
9 - Location if not on main campus :			
10 - Mode of Instruction (mark all that apply)			
A - Traditional classroom	√	What percentage?	100 %
B - Blended (traditional and online)		What percentage?	..... %
D - e-learning		What percentage?	..... %
E - Correspondence		What percentage?	..... %
F - Other		What percentage?	..... %
Comments :			

B Objectives

What is the main purpose for this course?

- Apply knowledge of mathematics, science, and engineering.
- Design and conduct experiments, as well as analyse and interpret data.
- Understand the impact of engineering solutions in a global and societal context.
- Recognize the need to engage in life-long learning.
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Briefly describe any plans for developing and improving the course that are being implemented :

- More time should be assigned to measurement applications,
- Data acquisition software should be offered

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction and Basic Concepts	2	2
Static characteristics in mechanical measurements	2	2
Curve Fitting	2	2
Measurement length area volume	2	2
Pressure Measurements	2	2
Temperature Measurements	2	2
Strain measurements	2	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	14	26	NIL.	NIL	54
Credit	1	.....	1	.....	.....	2

3. Additional private study/learning hours expected for students per week.

..NIL.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	**Description of the knowledge to be acquired** An understanding of the definition, necessary background and importance of the subject of Mechanical Measurements, in addition to the abilty to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to: • Be acquainted with Uncertainty, Data collection and analysis, Analog and digital signal analysis, Instrumentation specifications, etc. • Have hands on laboratory experience of the experimental and practical design aspects of important mechanical engineering measurement concepts, • Be able to write good technical reports.	Lectures, tutorials, laboratory and project. Introductory lecture gives an overview of I the content and methods of assessment. Tutorials review the content of each lecture. Project requires use of reference textbook from library and websites from internet. Examinations are comprehensive, including subjects from all assigned readings, lectures, laboratory activities, and classroom demonstrations.	• Attendance of lectures, laboratory and tutorials is a must. • There will be two midterm examination, one project and one final test. Examinations are comprehensive, including subjects from all assigned readings, lectures, laboratory activities, and classroom demonstrations. Written exams to measure knowledge and understanding, Intellectual skills, and Professional skills. • Tools: ✓ Mid Term Exam 1 to measure Knowledge and understanding ✓ Mid Term Exam 2 to measure Knowledge and understanding ✓ Final Exam to measure Knowledge and understanding ✓ Term project to measure Intellectual skills, Professional skills and General skills.
2.0	**Cognitive Skills**		
2.1	• **Description of cognitive skills to be developed** • Develop experimental skills in modern engineering measurement methods. • Develop proficiency in the area of electronic instrumentation and computer-based data acquisition systems. • Ability to plan and to execute an experiment based on uncertainty analysis. • Participation of 3 to 4 students as a group in each Lab. Experiment and report writing. • Using Internet search for selecting specific sensor dynamic characteristic.	• Explanation and examples given in lectures • Use of questioning techniques during the learning process • Lab work to consolidate experimentation skills and understanding.	• *Assignments that* require application of different sensors in mechanical measurements. • Experiments in Lab, planning of experiment and report writing • Discussion and analysis of results. • *Individual assignments, which require use of references in the college library as well as web sites.*
3.0	**Interpersonal Skills & Responsibility**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.1	**Description of the interpersonal skills and capacity to carry responsibility to be developed** • To develop and improve students' skills in experimental data acquisition, • To develop capacity for self-directed learning through individual assignments which requires web search for sensor information and reporting • To bear responsibility as a member in a group of 3-4 students to plan, conduct experiment in the lab., and writing a technical report.	• Carrying out individual assignment, which requires independent study using web sites. • Carrying out 7- 8 experiments in the lab. In addition, writing a common report for each experiment as teamwork (3-4students). • The first draft of the report submitted by each group will be marked and returned to them for editing/correcting to be resubmitted after a week for final marking.	• Assessing the contribution of each student in the group to the content and style of technical reports submitted by each group • Assessments of each student individual assignment.
4.0	**Communication, Information Technology, Numerical**		
4.1	**Description of the skills to be developed in this domain.** Ability of the students to apply basic practice in industry or power plant.	Questions of tests and assignments require students' knowledge in the course materials	Through the students' aggregate score in all tests and assignments.
5.0	**Psychomotor**		
5.1	Not Applicable	Not Applicable	Not Applicable

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	6th week	20%
2	Second Major Exam	12th week	20%
3	Final Exam	Final exam week	40%
4	Assignments	Total four	20%

D. Student Academic Counseling and Support

- Each faculty is required to be available in his office to devote at least 3 hr/week for students' consultation and academic advice.
- Teaching assistance taking the tutorial is required to devote 1hr/week for helping the student

E. Learning Resources

1. List Required Textbooks :
Theory and Design of Measurement Systems, R. S. Figliola and D.E. Beasley, John Wiley & Sons, 2006

2. List Essential References Materials :
A.J. Wheeler and A.R. Ganji, *Introduction to Engineering Experimenntation*, Prentice Hall, 1996

3. List Recommended Textbooks and Reference Material : NIL

4. List Electronic Materials :
Any Related material including the YouTube videos relating to engineering measurement

5. Other learning material :

F. Facilities Required

1. Accommodation
Accommodation (Lecture rooms, laboratories, etc.):

- One lecture room per group of 25 or less students,
- Mechanical measurement lab.

2. Computing resources

3. Other resources

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Interactive learning in the class
- Course evaluation questionnaire

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- Direct discussion with student during individual student consultations at offices of the dean, the vice-dean or the department-head

3 Processes for Improvement of Teaching :

- Course delivery by citing real life examples and problems
- Emphasis on understanding concepts and illustrating applications to problems

- Solving problems through assignments on each topic
- Writing notes are provided.
- Interacting in class room through raising thinking questions

4. Processes for Verifying Standards of Student Achievement

- Independent check of End-Semester exam
- Check of course files by Quality Centre nominee and give suggestions for improvement in writing.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Analysis of mid-term exam score
- Analysis of degree of interaction of students in class
- Direct discussion with student during individual student consultations at office
- Review of course-file at mid of semester
- Review of course-report at the beginning of following semester
- Analysis of student feedback at end of semester
-

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Shemy m. ahmed	***Name :***	Dr Saleh Aldahash.
Signature :	Shemy m. ahmed.	***Signature :***	.....
Date :	…./ … / …… *H*	***Date :***	…./ … / …… *H*

Institution:	*Majmaah University*.
Academic Department :	*Mechanical and Industrial Engineering*.
Programme :	*Bachelor in Mechanical and Industrial Engineering*.
Course :	*Refrigeration and Air Conditioning,(ME- 355)*.
Course Coordinator :	***Dr. Waqar hmed Khan***.
Programme Coordinator :	**Dr. Saleh Al Dahash**
Course Specification Approved Date :	25/01/1436

A. Course Identification and General Information

1 - Course title : *Thermodynamics I*	Course Code: *ME- 231*
2. Credit hours : *3 (2,1,2)*	
3 - Program(s) in which the course is offered: *Mechanical and Industrial Engineering*	
4 – Course Language : English	
5 - Name of faculty member responsible for the course:	***Dr. Waqar Ahmed Khan.***
6 - Level/year at which this course is offered :	*Third Year, F.S, / Level 8,2015-16*
7 - Pre-requisites for this course (if any) :	
8 - Co-requisites for this course (if any) :	
9 - Location if not on main campus : *(College of Engineering, Majmaah, University, Majmaah, KSA)*	

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	√	What percentage?	10%
D - e-learning	√	What percentage?	10 %
E - Correspondence	×	What percentage?	0 %
F - Other	×	What percentage?	0%

Comments :NO comments on it

B Objectives

What is the main purpose for this course?

This course aims to achieve the following objectives

1.Understand basic concepts of Thermodynamics and definitions of Energy and its forms

2. To know Phase transformation of pure substance

.

3. To understand laws of conservation of mass and energy

4. To Apply laws to closed system, steady flow system and unsteady system

Briefly describe any plans for developing and improving the course that are being implemented :

Better utilization of Thermodynamics laboratory so that students can experience the practical application of the theory of Thermodynamics

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Basic concepts of Thermodynamics and definitions. Processes and cycles.	2	4
Concept of thermodynamics Properties & definition of state	3	6
Working fluids: steam, ideal and real gases	3	6
Law of conservation of mass	2	4
First law of thermodynamics: concept and application	3	6
Second law of thermodynamics: concept and application	2	4

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	-	Nil	Nil	45
Credit	2	***1***	**-**	Nil	Nil	3

3. Additional private study/learning hours expected for students per week.

3*hr*s

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge (a, e ,k)**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.1	*An ability to apply principles of engineering, mathematics, and science in application of Engineering & Technology.*	*Lectures, tutorials and independent study assignments.*	*Home assignments of 10 points and Quizzes.Exam-1*
1.2	*Ability to model and solve engineering problems.*	*Animations of fundamentals of R.A.C and problems on it* *Power point presentation on different topic related to this subject*	*Examining the progress through Exam 1 and Exam 2, each of 15 points, Final exam*
1.3	*Ability to use engineering skills, tools and techniques necessary for engineering practices.*	*Individual assignments require use of library reference material and web sites to identify information required to complete tasks*S, Experiments	*Final assessment of the knowledge through final end term examination and lab reports of 15 points*
2.0	**Cognitive Skills**		
2.1	*Ability to think critically and analytically*	*Regularity during lecture classes is essential.*	*Class participation*
2.2	*Ability to develop tests in the areas covered at different levels.*	*Revising class instructions to keep up to date on the subject is key to learning*	*Peer/group response*
2.3	*Ability to produce test items in areas studied.*	*Time Management is always important to be free from burden of the subject*	*Lab reports*
2.4	*Time Management is always important to be free from burden of the subject.*	*Joint study sessions amongst students reduce doubts, promotes learning* *Solving the home*	*In-term and final.*

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		assignments and worksheets is needed for practice	
3.0	**Interpersonal Skills & Responsibility**		
3.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion and Evaluation*
3.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour Conducting group experiments and writing group reports, Work in groups for solving certain problems Assessing communicative Skills*	*Conducting group experiments and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.0	**Communication, Information Technology, Numerical**		
4.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion And Evaluation.*
4.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour*	*Conducting group discussion and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.3	*Use of web internet and Use of PowerPoint and laptop – projector systems*	*Writing Project/Lab reports*	*Discussion, Questioning during topics*
4.4	*Use of the advanced features in scientific calculators.*	*Incorporating the use and utilization of computer in the course requirements electronic copy of the lectures was distributed*	*Highlighting the concepts and principles through real life problems*
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	*First Major Exam*	*After 6th Week*	15
2	*Second Major Exam*	*After 12th Week*	15
3	*Final Exam*	*After 15th Week*	40
4	*Quizzes*	*Week 5,11*	7.5
5	*Homework assignments*	*Week 4, 6,12*	7.5
6	*Lab assignments*	*After 12th Week*	15

D. Student Academic Counseling and Support

• *SUNDAY*	• *10.00 A.M. TO 12.00 NOON*
• *MONDAY*	• *10.00 A.M. TO 12.00 NOON*
• *WEDNESDAY*	• *12.00 NOON TO 2.00 P.M.*

E. Learning Resources

1. List Required Textbooks :

- Thermodynamics an Engineering Approach by Cengel & Boles, McGraw Hills
- Engineering Thermodynamics, D.B. Spalding & E.H. Cole, Edward Arnold

2. List Essential References Materials :

- *NA*

3. List Recommended Textbooks and Reference Material :

- *As mentioned above*

4. List Electronic Materials :

- *Com Sol (Heat transfer, fluid flow)*

5. Other learning material :

- *Com Sol (Heat transfer, fluid flow)*
- *Thermo fluid software springer (Thermo fluid)*

F. Facilities Required

1. Accommodation

- *Lecture Rooms*

2. Computing resources

- *Proper projector system*

13. Other resources.

Nil

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- *Direct interaction with different groups of students.*
- *As per routine being practiced in the college.*
- *Course evaluation forms filled by students attending the course.*

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- *NA*

3 Processes for Improvement of Teaching :

- *Training for solving more exercise sessions.*
- *Workshops to facilitate the exchange of experiences amongst faculty members.*
- *Regular meetings where problems are discussed and solutions given.*
- *Attending professional development conferences.*
- *Industrial Interaction*

4. Processes for Verifying Standards of Student Achievement

- *Samples of students' assignments and exams are collected every semester and reviewed with faculty members.*
- *Examine students by basic concept questions on subject after completion of semester.*
- *Result of students also reflects the standard of knowledge.*
- *Group discussions on various subject topics should be conducted and assessed by the senior faculty member*

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- *Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.*

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr Waqar Ahmed Khan	***Name :***	**Dr. Saleh Al Dahash**
Signature :	.....	***Signature :***	.....
Date :	28/ 03 / 1437-38 *H*	***Date :***	28/ 03 / 1437-38 *H*

College: Engineering, Department of Mech. & Industrial Engg.
Programme: Mechanical Engineering
Course: Material Engineering (ME-251)

Institution:	Majmaah University
Academic Department :	Mechanical Engineering
Course :	ME-251...
Course Coordinator :	Dr. Waseem S Khan
Programme Coordinator :	Dr. Abdulaziz

Course Specification Approved Date : 25/01/1436

A. Course Identification and General Information

1 - Course title :	Material Engineering... Course Code: ME-251.
2. Credit hours :	(.....3.....)
3 - Program(s) in which the course is offered:	..... Mechanical Engineering.....
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	..1.....
6 - Level/year at which this course is offered :	....

7 - Pre-requisites for this course (if any) :

- .....A/N.....

8 - Co-requisites for this course (if any) :

- .....N./.A.....

9 - Location if not on main campus..... :
Engineering Building.

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	y	What percentage?	60..... %
B - Blended (traditional and online)	y	What percentage?	10..... %
D - e-learning		What percentage?	..... %
E - Correspondence	y	What percentage?	30..... %
F - Other		What percentage?	..... %

Comments :

.....

B Objectives

What is the main purpose for this course?

The students should be familiar with the basic concept of
Types of Materials and their properties
Atomic Structure & Interatomic Bonding
The Structure of Crystalline Solids
Imperfections in Solids
Diffusion
Mechanical Properties
Deformation & Strengthening Mechanisms
Failure Mechanism in Solids
Phase Diagrams
Phase Transformation
Polymers and Composites

.....

Briefly describe any plans for developing and improving the course that are being implemented :

Involve students in more experiments and projects.

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
. Introduction, Importance of Materials Engineering, Classification of materials.....	.....06..	.....06...
Molecular bonding, Properties and micro structure, Crystal geometry Atomic Movement and rearrangement	09	09
Properties of Materials, Elastic and Plastic behavior, Stress strain diagrams	.....06.	.... .06.....
.. Phase diagrams and solid phase solutions, Iron carbon Diagram Disorder in solids...	.....06...	.....06...

….. Applications of Metals, Classifications, Manufacturing processes…..	…..06….	…..06..
.. Fracture Mechanics…..	……06..	…..06…..
.. Diffusion……..	……06..	……06….
…. Types of dislocations in metals……	……06.	……06….
……	……	……

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	……2….	……1…..	……..2..	…….	…….	**…….3….**
Credit	……2…..	……1…..	……..2….	…….	…….	**……3…..**

3. Additional private study/learning hours expected for students per week.

……..2…

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Classification of different materials and their applications	Power point presentation, explanation, questions and answer section, group discussions	Exams, Quiz, Assignments and Group Discussions
1.2	Imperfections in solids**.**	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes.	Exams, Quiz, Assignments and Group Discussions
1.3	Understand the properties of materials	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
1.4	Polymers and composites	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
1.5	Diffusion	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
1.6	Mechanical Properties and Phase Diagrams	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.0	**Cognitive Skills**		
2.1	Revision and recapitulating in the beginning of class and asking students to recall the contents of previous class	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
2.2	Involving the students to solve problems	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
2.3	.....	.....	.....
3.0	**Interpersonal Skills & Responsibility**		
3.1	Motivating through participating in groups discussions	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
3.2	Ability to think and suggest new materials and applications	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
3.3	.....	.....	.....
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicating with use of technical words related to the courses contents and ability to present with the aid of power point presentations	Power point presentation, explanation, questions and answer section, group discussions and assignments and quizzes	Exams, Quiz, Assignments and Group Discussions
4.2	.....	.....	.....
4.3	.....	.....	.....
5.0	**Psychomotor**		
5.1	+ ...00.....	.....	.....
5.2	.....	.....	.....
5.6	.....	.....	.....

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	7	20
2	Second Major Exam	12	20
3	Final Exam	Final exam week	40
4	Quiz 1&2	04, 11	10
5	Homework assignments	10	10

6			

D. Student Academic Counseling and Support

Two hours/week are allocated for students counseling and advising by the Instructor

E. Learning Resources

1. List Required Textbooks :

- Materials Science and Engineering - An Introduction, W.D. Callister, 7 ed, John Wiley, 2007.
- Elements of Materials Science and Engineering, L.H. Van Vlack, Addison-Wesley Publishing Co, 1985.
- .
- .....

3. List Recommended Textbooks and Reference Material :

Fundamentals of Materials Science
(Mittemeijer, Eric J.)

-
- .....

4. List Electronic Materials :

- Some video clips on Steel making
  Some video clips on experiments
-

F. Facilities Required

1. Accommodation

- We have spacious class rooms
- .....

2. Computing resources

We have computer labs.

-

3. Other resource

Labs for experimentations.

- ..

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

..... Teaching Evaluation

- .

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

..... Teaching Evaluation by the deptt.....

- .....

3 Processes for Improvement of Teaching :

Collaboration with other universities

-
- .....
- .....

4. Processes for Verifying Standards of Student Achievement

..... Checking standard of education with other universities.....

- .....
- .....

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

Collaboration with other professor
Review course materials
Latest reading materials such as research papers and conference papers

-
- .....
- .....

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	.....	***Name :***	.....
Waseem Sabir Khan			
Signature :	.....	***Signature :***	.....
W.S.Khan			
Date :	…25./ 3… / …1437…	***Date :***	./ … / …… *H*

Institution:	*Majmaah University.*
Academic Department :	*Mechanical and Industrial Engineering.*
Programme :	*Bachelor in Mechanical and Industrial Engineering.*
Course :	*Machine Elements Design,(ME- 222)*
Course Coordinator :	***Dr. Vakkar Ali***
Programme Coordinator :	**Dr. Saleh Al Dahash**
Course Specification Approved Date :	**25 /01 /1436 *H***

A. Course Identification and General Information

1 - Course title :	*Machine Elements Design* Course Code: *ME- 222*
2. Credit hours :	*3 (2,1,2)*
3 - Program(s) in which the course is offered:	*Mechanical and Industrial Engineering*
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	***Dr. Vakkar Ali.***
6 - Level/year at which this course is offered :	*Second Year F.S. / Level 6,2015-16*

7 - Pre-requisites for this course (if any) :

- *ME-121,ME-232*

8 - Co-requisites for this course (if any) :

- *Nil*

9 - Location if not on main campus **:**

(College of Engineering, Majmaah, University, Majmaah, KSA)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	*80 %*
B - Blended (traditional and online)	√	What percentage?	*10%*
D - e-learning	√	What percentage?	*10 %*
E - Correspondence	×	What percentage?	*0 %*
F - Other	×	What percentage?	*0%*

Comments :NO comments on it

B Objectives

What is the main purpose for this course?

1. An understanding of the definition, necessary background and importance of the subject of Design.
2. Use the techniques, skills, and modern engineering tools necessary for engineering practice.
3. Students are able to design the machine elements and able to work on the systems related to this course.

Briefly describe any plans for developing and improving the course that are being implemented :

Better utilization of Design laboratory so that students can experience the practical application of the theory of machine design

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Review of stress analysis (combined stress, bending).	1	3
Materials in mechanical design and safety factors.	1	3
Power transmission gears	2	6
Design of shafts, Design of springs,	3	9
Design of ball bearing, sliding bearings	2	6
Design of couplings, clutches, brakes, belts	3	9
Design of riveted	1.5	4
Design of welded	1.5	4

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	14	28	Nil	Nil	72
Credit	2	***1***	***2***	Nil	Nil	3

3. Additional private study/learning hours expected for students per week.

2*hr*s

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	An ability to apply	Lectures, tutorials and independent	Home assignments of 5 points

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	principles of engineering, mathematics, and science in application of Engineering & Technology.	study assignments.	and Quizzes Exam of 5 points,
1.2	Ability to model engineering problems.	Animations of fundamentals of Machine Design and problems on it Power point presentation on different topic related to this subject	Examining the progress through Exam 1 and Exam 2, each of 20 points, Final exam and lab assessment of 10 points
1.3	An ability to use engineering skills, tools and techniques necessary for engineering practices.	Individual assignments require use of library reference material and web sites to identify information required to complete task	Final assessment of the knowledge through final end term examination of 40 points
2.0	**Cognitive Skills**		
2.1	Ability to think critically and analytically	Regularity during lecture classes is essential.	Class participation
2.2	Ability to develop tests in the areas covered at different levels.	Revising class instructions to keep up to date on the subject is key to learning	Peer/group response
2.3	Ability to produce test items in areas studied.	Time Management is always important to be free from burden of the subject	Lab reports
2.4	Time Management is always important to be free from burden of the subject.	Joint study sessions amongst students reduce doubts, promotes learning Solving the home assignments and worksheets is needed for practice	In-term and final.
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work in groups and independently and Manage resources, time and other members of the group.	Solve the problems by asking sequential questions	Homework Discussion and Evaluation
3.2	Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour Conducting group experiments and writing group reports, Work in groups for solving certain problems Assessing communicative Skills	Conducting group experiments and writing group reports, Work in groups for solving certain problems	Assessing communicative Skills
4.0	**Communication, Information Technology, Numerical**		
4.1	Work in groups and independently and Manage resources, time and other members of the group.	Solve the problems by asking sequential questions	Homework Discussion And Evaluation.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.2	Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour	Conducting group experiments and writing group reports, Work in groups for solving certain problems...	Assessing communicative Skills
4.3	Use of web internet and Use of PowerPoint and laptop – projector systems	Writing Project/Lab reports	Discussion, Questioning during topics
4.4	Use of the advanced features in scientific calculators.	Incorporating the use and utilization of computer in the course requirements electronic copy of the lectures was distributed	Highlighting the concepts and principles through real life problems
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	After 6th Week	20
2	Second Major Exam	After 12th Week	20
3	Final Exam	After 15th Week	40
4	Quizzes	Week 5,11	5
5	Homework assignments	Week 4, 6,12	5
6	Lab assignments	After 12th Week	10

D. Student Academic Counseling and Support

• *SUNDAY*	• *10.00 A.M. TO 12.00 NOON*
• *MONDAY*	• *10.00 A.M. TO 12.00 NOON*
• *WEDNESDAY*	• *12.00 NOON TO 2.00 P.M.*

E. Learning Resources

1. List Required Textbooks :

- *Introduction To Machine Design" V. B. BHANDARI, Tata McGraw-Hill Education, 2001*
- *Mechanical Engineering Design, Shigley, Mischke, Budynas, McGraw Hill, 7th Ed, 2003*

2. List Essential References Materials :

- *NA*

3. List Recommended Textbooks and Reference Material :

- *As mentioned above*

4. List Electronic Materials :

- *ComSol (Machine Design,Strength of Materials,*
- *Data design Book*

5. Other learning material :

- *Electronic Materials, Web Sites etc*
- *http://www.springer.com/engineering/mechanical+engineering/journal/231*
- *http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc*

F. Facilities Required

1. Accommodation

- *Lecture Rooms*
- *Machine Element Design Lab*
- *Developing a Design laboratory where simple demonstration to show the experimental validation of theory should be developed.*

2. Computing resources

- *Proper projector system*

20. Other resources.

- *NA*

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- *Direct interaction with different group of students.*
- *As per routine: being practiced in the college.*
- *Course evaluation forms filled by students attending the course.*

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- *NA*

3 Processes for Improvement of Teaching :

- *Training for solving more exercise sessions.*
- *Workshops to facilitate the exchange of experiences amongst faculty members.*

- *Regular meetings where problems are discussed and solutions given.*
- *Attending professional development conferences.*
- *Industrial Interaction on trends*

4. Processes for Verifying Standards of Student Achievement

- *Samples of students' assignments and exams are collected every semester and reviewed with faculty members.*
- *Examine students by basic concept questions on subject after completion of semester.*
- *Result of students also reflects the standard of knowledge.*
- *Group discussions on various subject topics should be conducted and assessed by the senior faculty member*

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- *Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.*

Course Specification Approved

Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator

Name : Dr. Vakkar Ali

Signature : .....

Date : 28/ 03 / 1437-38 *H*

Department Head

Name : **Dr. Saleh Al Dahash**

Signature : .....

Date : 28/ 03 / 1437-38 *H*

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Mechanics of Materials — Course Code: ME 232
2. Credit hours :	3(3,1,0)
3 - Program(s) in which the course is offered:	B.Sc. Mechanical and Industrial Engineering
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	Dr. Tarek Mohamed Ahmed Ali EL-Bagory
6 - Level/year at which this course is offered :	Level 6/ 1436-1437H (2015-2016) First Semester

7 - Pre-requisites for this course (if any) :

- ME 251

8 - Co-requisites for this course (if any) :

- NA

9 - Location if not on main campus **:**
(In the Main Building)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	*	What percentage?	100 %
B - Blended (traditional and online)		What percentage?	……. %
D - e-learning		What percentage?	……. %
E - Correspondence		What percentage?	……. %
F - Other		What percentage?	……. %

Comments :
……

B Objectives

What is the main purpose for this course?

- Acquisition of knowledge by learning new theories, concepts, and analytical procedures in basic mechanics of material.
- Cognitive skills through thinking and problem solving.
- Numerical skills through application of knowledge in basic mathematics.
- Student becomes responsible for their own learning through solutions of assignments and time management.

Briefly describe any plans for developing and improving the course that are being implemented :

The course contents will be periodically reviewed by the instructors and the Undergraduate Committee to include new materials of relevance and improved teaching method.

C. Course Description

1. Topics to be covered

List of Topics	No. of Weeks	Contact Hours
Introduction – Concept of Stress	2	8
Stress and Strain – Axial Loading	1	4
Torsion	1	4
Pure Bending	1	4
Analysis and Design of Beams for Bending	2	8
Shearing Stresses in Beams and Thin-Walled Members	3	12
Transformations of Stress and Strain	2	8
Principle Stresses Under a Given Loading	2	8
Deflection of Beams	1	4
Total	15	60

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15	0	Nil	Nil	60
Credit	45	0	0	Nil	Nil	45

3. Additional private study/learning hours expected for students per week.

4-6 hours

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	To learn about the types of stress, strain, and load	Course delivery by citing real life examples and problems,	Regularly asking questions on different topics and concepts,
1.2	To develop the skills of idealization of Stress and shaft design,	Emphasis on understanding concepts and illustrating applications to problems,	Interactive problem solving with students,
1.3	Make a full design for beam,	Solving problems through assignments on each topic,	Placing before the class mind provoking and thinking questions,
1.4	Draw bending moment and normal diagrams for shaft and beams,	Background materials from the books are provided,	Assignment problems, Exercise / tutorial problems for applications that will force the students to think and apply the knowledge gained,
1.5	Drawing the stress distribution on the thick cylinder (radial, hoop, and tangential stress),	Extensive interaction with students.	Mid-term and End-semester tests that will force the student to think and apply the knowledge.
1.6	Make a full design of gear box,		
1.7	To learn about fasteners joint.		
2.0	**Cognitive Skills**		
2.1	Thinking through problems solving, reasoning for each problem solved,	Explaining principles and concepts through real life problems,	Asking students to solve the problem in class,
2.2	Remembering equations and principles,	Interactive problem solving with students,	Setting assignment problems which will apply principles and concepts,
2.3	Reasoning in solving a problem step by step.	Asking a student to explain the steps adopted in the problem in Arabic-Summarize,	Problems in Quiz, Mid Term Test and End semester tests which will compel the student to think and apply concepts and principles learnt.
2.4		Asking searching questions on topic fundamentals,	
2.5		Setting quiz and exercise problems so that students can apply the knowledge gained,	
2.6		Setting M-1 and M-2 problems which will force a student to	

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		think and apply the knowledge	
3.0	Interpersonal Skills & Responsibility		
3.1	Help the student to solve the problem by asking questions during the office hour,	Solve the problems by asking sequential questions.	Very few opportunities in this course,
3.2			Only during office hours when a student cam to solve some queries.
3.3	....	.....	.....
3.4	....	.....	.....
3.5	....	.....	.....
3.6	....	.....	.....
4.0	Communication, Information Technology, Numerical		
4.1	Mathematical skills,	Asking students to solve problems in the class by guiding him,	Discussion, Questioning during topics,
4.2	Asking students to solve problems and explaining to the class the steps and summarize the problem in Arabic.	Asking small problems for numerical skills.	Highlighting the concepts and principles through real life problems,
4.3			Asking the students to solve the numerical part and check that the answers are tallying with background notes.
4.4	....	.....	.....
4.5	....	.....	.....
4.6	....	.....	.....
5.0	Psychomotor		
5.1	NA	NA	NA
5.2	....	.....	.....
5.3	....	.....	.....
5.4	....	.....	.....

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
5.5	....	.....	.....
5.6	....	.....	.....

5. Schedule of Assessment Tasks for Students during the Semester:

No.	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	5th week	20 %
2	Second Major Exam	10th week	20 %
3	Final Exam	Final exam week	40 %
4	Quiz	Continuous	10 %
5	Homework assignments	Continuous	10 %

D. Student Academic Counseling and Support

Office Hours: Sunday: from 10:00-11:50 Monday: from 9:00-10:50 Tuesday: from 9:00-10:50 Wednesday: from 9:00-10:50

E. Learning Resources

1. List Required Textbooks :

- Mechanics of Materials 6th Beer Johnston (2012)
- Mechanics of Materials 7E Hibbler (2006)
- Mechanics of Materials 2nd Ed Andrew Pytel (2012)

2. List Essential References Materials :

- Engineering Fracture Mechanics
- Journal of Materials Design and Applications
- International Journal of Fracture

3. List Recommended Textbooks and Reference Material :

- Engineering Fracture Mechanics
- Journal of Materials Design and Applications
- International Journal of Fracture

4. List Electronic Materials :

- .....
- .....
- .....

5. Other learning material :

- Handouts

F. Facilities Required

1. Accommodation

- Lecture room
- 003-4-33-1 (Sunday)
- 003-4-34-1 (Monday)
- 003-4-34-1 (Wednesday)
- 003-3-276-1 (Thursday)

2. Computing resources

- Computer and internet

3. Other resources

- Material Laboratory

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Completion course evaluation questionnaire,
- Classroom observations to measure Student Behaviour through how well the student groups are interacting in-class activity and how well the in-class activity went.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- .....
- .....
- .....

3 Processes for Improvement of Teaching :

- .....
- .....
- .....

4. Processes for Verifying Standards of Student Achievement

- Check marking of a sample of examination papers.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Continuous improvement is a circular process, encompassing student assessment, course planning and design, implementation, evaluation, and revision.
- A feedback from all relevant assessment tools must be considered in the continuous process of course objectives refinement and assessment.
- Continuous process for reviewing feedback from student on the quality of the course and planning for improvement.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr. Tarek Mohamed Ahmed Ali EL-Bagory	***Name :***	Dr. Saleh Aldahsh
Signature :	Dr. Tarek EL-Bagory	***Signature :***	Dr. Saleh Aldahsh
Date :	27/3 /1437 H	***Date :***	27/3 /1437 H

Institution:	**Majmaah University**
Academic Department :	**Mechanical and Industrial Engineering**
Programme :	**Mechanical and Industrial Engineering**
Course :	**Mechanical Vibration**
Course Coordinator :	**Dr. Tarek Mohamed Ahmed Ali EL-Bagory**
Programme Coordinator :	**Dr. Saleh Aldahsh**

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Mechanical Vibration — Course Code: ME 242
2. Credit hours :	3(3,1,0)
3 - Program(s) in which the course is offered:	B.Sc. Mechanical and Industrial Engineering
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	Dr. Tarek Mohamed Ahmed Ali EL-Bagory
6 - Level/year at which this course is offered :	Level 5/ 1436-1437H (2015-2016) First Semester

7 - Pre-requisites for this course (if any) :

- GE 305

8 - Co-requisites for this course (if any) :

- NA

9 - Location if not on main campus : (In the Main Building)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	*	What percentage?	100 %
B - Blended (traditional and online)		What percentage?	……. %
D - e-learning		What percentage?	……. %
E - Correspondence		What percentage?	……. %
F - Other		What percentage?	……. %

Comments :

……

B Objectives

What is the main purpose for this course?

- To introduce the basic concepts and train the students to analyze vibration problems in mechanical engineering
- Analyzing free and force (harmonic) vibration for single and multi degree of freedom systems
- Analyzing vibration response of a single degree of freedom system under general forcing condition
- Deriving equations of motions for a free and force damped and undamped vibration systems using either Newton's 2nd law.
- Become proficient in the modeling and analysis of one-DOF-systems - free vibrations, transient and steady-state forced vibrations, viscous and hysteric damping.

- Become proficient in the modeling and analysis of multi-DOF systems.
- Ability to acquire and apply fundamental principles of science and engineering
- Capability to communicate effectively
- Acquisition of technical competence in specialized areas of engineering discipline
- Ability to identify, formulate and model problems and find engineering solutions based on a systems approach,
- Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.

Briefly describe any plans for developing and improving the course that are being implemented :

- Course delivery by citing real life examples and problems
- Emphasis on understanding concepts and illustrating applications to problems
- Solving problems through assignments on each topic
- Background materials from the books are provided.
- Extensive interaction with students.

C. Course Description

1. Topics to be covered

List of Topics	No. of Weeks	Contact Hours
Free and damped vibration of single degree of freedom systems.	2	8
Viscous damping,	1	4
Forced vibration and resonance, harmonic excitation. and rotating unbalance,	3	12
Base motion, and vibration isolation,	1	4
Two degree of freedom systems,	2	8
Frequencies, mode shapes, and modal analysis,	2	8
Multi-degree of freedom systems, and matrix methods,	2	8
Continuous systems, axial, torsional and bending vibrations.	2	8
Total	15	60

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15	0	Nil	Nil	60

Credit	45	0	0	Nil	Nil	45

3. Additional private study/learning hours expected for students per week.

4-6 hours

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	To introduce the basic concepts and train the students to analyse vibration problems in mechanical engineering	Lectures, tutorials and self-learning assignments.	Attendance of lectures and tutorials is a most.
1.2	Analysing free and force (harmonic) vibration for single and multi-degree of freedom systems	Introductory lecture gives an overview of the content and methods of assessment.	Attendance of lectures and tutorials is a most. There will be no. of quizzes, homeworks, two midterm examination and one final examination. Examinations are comprehensive, including subjects from all assigned readings, lectures, and classroom demonstrations.
1.3	Analysing vibration response of a single degree of freedom system under general forcing condition	Tutorials review the content of each lecture.	Quizzes and homeworks on completion of each topic to measure knowledge items.
1.4	Deriving equations of motions for a free and force damped and undamped vibration systems using either Newton's 2nd law.	Assignments require use of reference textbook from library and websites from internet. Homework assignments will consist of problem solving cases.	Tools: a. Mid Term Exam 1 to measure Knowledge and understanding, b. Mid Term Exam 2 to measure Knowledge and understanding, c. Final Exam to measure Knowledge and understanding. d. Quizzes and Homework to measure Knowledge and understanding
1.5	Become proficient in the modeling and analysis of one-DOF-systems - free vibrations, transient and steady-state	Examinations are comprehensive, including subjects from all assigned readings, lecture, and classroom	

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	forced vibrations, viscous and hysteric damping.	demonstrations.	
1.6	Become proficient in the modeling and analysis of multi-DOF systems.		
1.7	Ability to acquire and apply fundamental principles of science and engineering		
1.8	Capability to communicate effectively		
1.9	Acquisition of technical competence in specialised areas of engineering discipline		
1.10	Ability to identify, formulate and model problems and find engineering solutions based on a systems approach		
1.11	Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.		
2.0	**Cognitive Skills**		
2.1	The study of Mechanical Vibration is an essential part of a comprehensive foundation in the engineering sciences.	Lectures, tutorials.	Attendance of lectures and tutorials is a most.
2.2	Mechanical Vibration requires the application of calculus, vector algebra, and other elements of mathematical reasoning.		Attendance of lectures and tutorials is a most. There will be no. of quizzes, homeworks, two midterm examination and one final examination. Examinations are comprehensive, including subjects from all assigned readings, lectures, and classroom demonstrations.
2.3	At the heart of Mechanical Vibration is precisely the ability to identify, formulate, and solve engineering problems.		Quizzes and homeworks on completion of each topic to measure knowledge items.
2.4	Training in Mechanical Vibration, particularly in developing sound problem-solving methodology, will prepare students for graduate school, to conduct research, and otherwise to discover		Tools: • Mid Term Exam 1 to measure Knowledge and understanding, • Mid Term Exam 2 to measure Knowledge and

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	knowledge throughout life.		understanding, • Final Exam to measure Knowledge and understanding, • Quizzes and Homework to measure Knowledge and understanding
3.0	**Interpersonal Skills & Responsibility**		
3.1	The study of Mechanical Vibration is an essential part of a comprehensive foundation in the engineering sciences.	Lectures, tutorials and self-learning assignments.	Attendance of lectures and tutorials is a most.
3.2	Mechanical Vibration requires the application of calculus, vector algebra, and other elements of mathematical reasoning.	Introductory lecture gives an overview of the content and methods of assessment.	Attendance of lectures and tutorials is a most. There will be no. of quizzes, homeworks, two midterm examination and one final examination. Examinations are comprehensive, including subjects from all assigned readings, lectures, and classroom demonstrations.
3.3	At the heart of Mechanical Vibration is precisely the ability to identify, formulate, and solve engineering problems.	Tutorials review the content of each lecture. Assignments require use of reference textbook from library and websites from internet.	Quizzes and homeworks on completion of each topic to measure knowledge items.
3.4	Training in Mechanical Vibration, particularly in developing sound problem-solving methodology, will prepare students for graduate school, to conduct research, and otherwise to discover knowledge throughout life.	Homework assignments will consist of problem solving cases.	Tools: • Mid Term Exam 1 to measure Knowledge and understanding, • Mid Term Exam 2 to measure Knowledge and understanding, • Final Exam to measure Knowledge and understanding, • Quizzes and Homework to measure Knowledge and understanding
4.0	**Communication, Information Technology, Numerical**		
4.1	Identify Mechanical Vibration system used in daily life.	Lectures, tutorials and self-learning assignments.	Attendance of lectures and tutorials is a most.
4.2	Be familiar with the concepts of Mechanical Vibration and its various aspect	Introductory lecture gives an overview of the content and methods of assessment.	Attendance of lectures and tutorials is a most.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.3	Be familiar with the analysis of Free Vibration. Harmonic Motion. Viscous Damping. Stiffness. Measurement. Design Considerations.	Tutorials review the content of each lecture.	There will be no. of quizzes, homeworks, two midterm examination and one final examination.
4.4	Be familiar with the analysis of Harmonic Excitation of Undamped Systems. Harmonic Excitation of Damped Systems. Base Excitation. Rotating Unbalance.	Assignments require use of reference textbook from library and websites from internet.	Examinations are comprehensive, including subjects from all assigned readings, lectures, and classroom demonstrations.
4.5	Be familiar with the analysis of Impulse Response Function. Response to an Arbitrary Input.	Homework assignments will consist of problem solving cases.	Quizzes and homeworks on completion of each topic to measure knowledge items.
4.6	Be familiar with the analysis of Two-Degree-of-Freedom Model (Undamped). Eigenvalues and Natural Frequencies. acceptable Levels of Vibration. Vibration Isolation. Vibration Absorbers. Damping in Vibration Absorption	Examinations are comprehensive, including subjects from all assigned readings, lecture, and classroom demonstrations.	Tools are Mid Term Exam 1 to measure Knowledge and understanding, Mid Term Exam 2 to measure Knowledge and understanding,
4.7	Be familiar with the analysis of Raleigh and Raleigh-Ritz methods. Continuous systems, axial, torsional and bending vibrations. Finite element method. Applications with computer programs.		Final Exam to measure Knowledge and understanding and Quizzes and Homework to measure Knowledge and understanding.
4.8	Solving Mechanical Vibration systems.		
5.0	Psychomotor		
5.1	None	None	None

5. Schedule of Assessment Tasks for Students during the Semester:

No.	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	5th week	20 %
2	Second Major Exam	10th week	20 %

3	Final Exam	Final exam week	40 %
4	Quiz	Continuous	10 %
5	Homework assignments	Continuous	10 %

D. Student Academic Counseling and Support

Office Hours: **Sunday: from 9:00-10:00** **Monday: from 11:00-12:00** **Tuesday: from 10:00-11:00** **Wednesday: from 10:00-11:00**

E. Learning Resources

1. List Required Textbooks :

- **Title: Engineering Vibration 3 edition, 2008 m Author: Daniel J. Inman, Virginia Polytechnic Institute and State University,**
- **Handout**

2. List Essential References Materials :

- **Mechanical Vibrations, 5/E, Prentice Hall, 2010 by Singiresu S. Rao, University of Miami**
- **Journal of Vibration and Control**
- **http://www.sagepublications.com**
- **Journal of Vibration and Acoustics (ASME)**

3. List Recommended Textbooks and Reference Material :

- **Journal of Vibration and Control**
- **http://www.sagepublications.com**
- **Journal of Vibration and Acoustics (ASME)**

4. List Electronic Materials :

- .....
- .....
- .....

5. Other learning material :

- **Handouts**

F. Facilities Required

1. Accommodation

- **Lecture room**
- **003-4-33-1 (Sunday)**
- **003-4-34-1 (Monday)**
- **003-4-34-1 (Wednesday)**
- **003-3-276-1 (Thursday)**

2. Computing resources

- **Computer and internet**

3. Other resources

- **None**

G Course Evaluation and Improvement Processes

2 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- **Completion course evaluation questionnaire,**
- **Classroom observations to measure Student Behaviour through how well the student groups are interacting in-class activity and how well the in-class activity went.**

2 Other Strategies for Evaluation of Teaching by the Program/Department

Instructor :

- .....
- .....
- .....

3 Processes for Improvement of Teaching :

- .....
- .....
- .....

4. Processes for Verifying Standards of Student Achievement

- Check marking of a sample of examination papers.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Continuous improvement is a circular process, encompassing student assessment, course planning and design, implementation, evaluation, and revision.
- A feedback from all relevant assessment tools must be considered in the continuous process of course objectives refinement and assessment.
- Continuous process for reviewing feedback from student on the quality of the course and planning for improvement.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr. Tarek Mohamed Ahmed Ali EL-Bagory	***Name :***	Dr. Saleh Aldahsh
Signature :	Dr. Tarek EL-Bagory	***Signature :***	Dr. Saleh Aldahsh
Date :	27/3 /1437 H	***Date :***	27/3 /1437 H

Institution:	Majmaah University.
Academic Department :	Dept. Mechanical & Industrial engineering.
Programme :	Mechanical & Industrial engineering.
Course :	Thermodynamics II.
Course Coordinator :	Iskander.
Programme Coordinator :	.

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Thermodynamics II. Course Code: ME 252
2. Credit hours :	) 2 (2,1,0) (
3 - Program(s) in which the course is offered:	. Bachelor degree: Mechanical & Industrial engineering Program……
4 – Course Language :	Eng.
5 - Name of faculty member responsible for the course:	Iskander.
6 - Level/year at which this course is offered :	Third year / Level 6

7 - Pre-requisites for this course (if any) :

- ME 231

8 - Co-requisites for this course (if any) :

- None

9 - Location if not on main campus :

(……)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	95 %
B - Blended (traditional and online)		What percentage?	……. %
D - e-learning	√	What percentage?	3 %
E - Correspondence	√	What percentage?	2 %
F - Other		What percentage?	……. %

Comments :

……

B Objectives

What is the main purpose for this course?

Thermodynamics is an exciting and fascinating subject that deals with energy, which is essential for sustenance of life, and thermodynamics has long been an essential part of engineering curricula all over the world..

Briefly describe any plans for developing and improving the course that are being implemented :

……

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Irreversibility and availability.	2-3	6
Thermodynamic property Relations.	4-5	6
Mixtures and solutions.	6-7	6
Chemical reactions and combustion.	8-9	6
Phase and Chemical equilibrium.	10-11	6
Thermodynamics of compressible flow.	12-13	6
Applications using computer.	14-15	6
.....	.....	.....
.....	.....	.....

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30....	**15**	0	0		**45**
Credit	2	1	0	0		.....

3. Additional private study/learning hours expected for students per week.

.. Minimum 2 to 3 Hours per week for the subject is sufficient for the students..

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	This course contributes primarily to the students' knowledge of engineering topics, but does not provide design experience. At the end of course the student is supposed to develop skills to deal with thermodynamics law and their application to physical problems.	Experience has shown that this subject has always been a source of attraction and motivation to the students. Following strategies or steps are planned to motivate students towards self-learning process as well: • Further motivating students by slowly starting with simple explanations and simple problems and then moving towards complex areas of the subject. • Discussing common day to day applications of the subject. (Demonstrated practically if possible with few of the topics.) • Initially asking the students simple questions on the subject and then highly appreciating their understanding aptitude. • Training how to use Thermodynamics laws, and this kind of physical rules to solve problem. • Physical problems applications of theoretical concepts through group projects. ✓ Lecture notes ✓ Power point presentation ✓ Interactive CD-ROMs, textbook, ✓ Discussion board ✓ A graph is worth a thousand words ✓ Make use of textbook graphic packages ✓ Emails: I try to respond to all emails within a 24 hour time period. If you do not get a reply from me within 24 hours please resend message. ✓ roup discussion: This will help you keep up the pace, find out what you may have forgotten to study, and help keep you motivated. Find a few students, who are serious about learning and get together to study, compare notes, quiz each other and keep current in the coursework. **Get in a good study group that meets regularly and includes at least two students.** ✓ Written assignment ✓ Self-reading in Book. **Talking closely together (students-teacher) and discussing the weaknesses of the students:** most college teachers truly want to see their students succeed and are ready to update their strategy of teaching according to the students' needs.	Mid Term I : 20 Point Mid Term II : 20 Point Final Term : 40 Point Home assignments & Quiz 20 Points Total 100 Points

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.0			
2.1	Description of cognitive skills to be developed Ability to think critically and analytically. Ability to interpret results of oriented problems, whether physically or mathematically	**Have perfect attendance:** **Don't miss lecture or lab.** This is the first thing students from previous semesters offer for advice. There is simply too much material covered too rapidly to catch up if you get behind. Print off the note taking pages for the chapters we will cover in class each day. **Keep up by studying regularly.** Read the chapters and note taking pages before you come to lecture. You will not succeed in this course if you wait until the day before an exam to study. You must drill on the material as it is presented. **Manage your time well**: schedule study time every day. **Cooperative learning works:** research has shown that students who study with other students usually perform better on exams. This can be difficult but it is worth the effort. From a small (2, 3 or 4 students) Study group and get together to work on review questions at the end of each section and chapter. **Study the right stuff**. The purpose of a lecture is to direct your attention to what you need to know. The notes clearly state what you are expected to learn. Recopying your notes and making flash cards are two essential techniques. **Practice!Practice!Practice!** After learning your notes put yourself in a test situation by answering each chapter's checkpoint and review questions and the text 's website chapter quizzes. You may want to write your own study exam to help you review the material either individually or in small groups. **Ask questions whenever you see something unclear. If you are having difficulty, get help early**. The sooner you ask me for help the more options we have to improve your learning.. Because learning through asking questions will make the student mind more active, and it will remember information in a better way. The student can make question during a lecture, or after it. Alternatively, asking question directly to me when have spare time. It will not only help you to learn more but also to create a stronger bond with me! **Improve your test-taking skills**; we will cover this in more detail before the first exam. **Do the homework assignemets worksheets**.	This is an important task. Assessment can be done using non-conventional and convention methods, both. Non-Conventional techniques require very close associative bond with each student. Every student has his own ingenuity where his creativity can be shaped. All techniques to assess should be optional and student can opt for any one activity. This brings out his decision making capability where he judges his comfort zone to participate and use his inherent mental abilities. ➢ Promoting and shaping projects originating from students' mind. ➢ Organizing students' seminars where the topics already taught can be used by the students to deliver a lecture. ➢ Planning surveys of various types to gather subject information in an organized statistical form and giving self-analysis based on the data collected. ➢ Deputing students on each individual test/experimental setup for its running and up keep. ➢ Developing simple demonstration equipment to show simple concepts of the subject and also for use in the laboratory or elsewhere. ➢ Article writing or even book writing can be one of the areas to explore.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
			➢ Starting students' chapters of various International societies for students to run the activities of the society. In fact, I personally used all these techniques regularly on 30 to 40 % of my students in class at mid-level of their under graduate course. The results were extra ordinary as this helped me to develop my own self too along with the students.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.0	**Interpersonal Skills & Responsibility**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.1	• Students can complete all assignments in due time • Students can participate in class discussion and think critically • Students can act responsibly and ethically in carrying out individual as well as group projects • Students have the necessary skills to communicate, listen, negotiate, and evaluate their strengths and weaknesses as members of a team • Students have the necessary skills to defend their points of view and/or proposed solution to any problem based on the acquired knowledge. • Students have the necessary skills to evaluate peers' answers and solutions, point and correct their mistakes	• Lectures in which students are made aware of the significance of time management • Discussions with students on ethical behaviour in conducting research • Individual counselling on research projects and subject matter difficulties. - Group assignments where much of the most effective learning comes from the student explaining, discussing and defending her own ideas with her peers. **- Break a chapter into manageable chunks**: Once the student read an entire chapter break up the text into three-four sections. Read and underline one section at a time before moving on to the next section. **- Utilize review tools in the text book**: One the student read and underlined the chapter; he should follow this by going directly to the review questions at the end of the sections. This is an important way to test his knowledge. - Students have to figure out what his learning style is, and fit his study approaches to that style. - Students are expected to develop certain teamwork activities regarding the theoretical part.	Active class participation reflects the students ability to keep up with the concealed math ideas Homework assignments will attest to the student's ability to fulfil required tasks and respect deadlines Performance on midterms and final exams are evidence of the student's ability to recollect and synthesize information. Instructor's assessment of student's performance and seriousness during individual practice hours
4.0	**Communication, Information Technology, Numerical**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.1	Use of Mathematical package and such Thermodynamics software. Use of web internet. Use of PowerPoint and laptop – projector systems. Use of the advanced features in scientific calculators.	Encourage students to consult the specialist in the computer lab for help on web-based material Demand the use of PowerPoint when giving presentations in projects Solving lots of problems using software. Students will be asked to deliver summary regarding certain topics related to the course. Students will be asked to prepare and present subjects using different educational strategies (power point presentation, projections…) Each student is expected to prepare and present one issue regarding to the course.	Some marks for the use of web-based material in students' presentations. Distribute some marks in every assigned project so students know what they will be evaluated on Set marks for the PowerPoint presentation students create to give their presentations, its content and their presentation skills. Set marks in doing lots of solving problems using software.
5.0	**Psychomotor**		
5.1	**.....**	……	……
5.2	**.....**	……	……
5.3	**.....**	……	……
5.4	**.....**	……	……
5.5	**.....**	……	……

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	HW, CW & Quiz Test-I	3rd/4th week	05
2	Mid Term I	7th week	20
3	HW, CW & Quiz Test-II	9th/10th week	05
4	Mid Term II	13th week	20
5	HW, CW & Quiz Test-III	14th week	05
6	project evaluation	15th week	05
7	Final Term	16th week	40
8	Total	……	100%

D. Student Academic Counseling and Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week):

Due support to solve the problems faced by the students while doing their self study is a must. In view of this the students are free to access the teaching staff as and when required during the free time of the concerned teacher.

To be specific and bounding following slots are allotted every week for the students to contact in the office of the concerned instructor of thermodynamics:

1. Monday: 10.00 am to 12.00am
2. Wednesday: 9.00 am to 10.00am

weekly office hours

E. Learning Resources

1. List Required Textbooks :

- Fundamentals of Thermodynamics, By: Sonntag, Borgnakke and Van Wylen. John Wiley & Sons, Inc. Sixth Edition, 2003. ……
- ……

2. List Essential References Materials :

- Introduction to chemical engineering thermodynamics 7th edition - Smith, Van Ness & Abbot.
- Thermodynamics An Engineering Approach, 5th ed - McGraw-Hill. Cengel ,Yunus A. and M. A. Boles,

3. List Recommended Textbooks and Reference Material :

- ……
- ……
- ……

4. List Electronic Materials :

- http://ocw.mit.edu/high-school/physics/kinetic-theory-thermodynamics/laws-of-thermodynamics/.
- ……
- ……

5. Other learning material :

- Thermodynamics software.
- ……
- ……

F. Facilities Required

1. Accommodation

- . Accommodation (Lecture rooms, laboratories, etc.):
- Classroom
- Developing a laboratory where simple demonstration to show the experimental validation of theory should be developed.
- Computer lab.
- ……
- ……

2. Computing resources

- Laptop computer
- projector system

3. Other resources

- ……
- ……
- ……

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Interactive learning in the class.
- Course evaluation questionnaire
- forms are filled by all students who attend the course…..

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

Direct discussion, of the authorities concerned, with students during students' Interactive sessions/meetings.

3 Processes for Improvement of Teaching :

- …… Discussions and explanation on subject citing real life examples and problems.
- Absorbing information as concepts and illustrating applications to problems.
- Training for solving more exercise sessions
- Workshops to facilitate the exchange of experiences amongst faculty members
- Regular meetings where problems are discussed and solutions given
- Attending professional development conferences

- Provide a brief summary of any other action taken to improve the course and the results achieved. (For example, professional development for faculty, modifications to the course, new equipment, new teaching techniques etc.)

- The time management will be more effective and well planned.

- I tried to on improve the assimilation of the course by introducing more teaching techniques like videos, presentations and especially the practical activities in the laboratory was enhanced.

- I did my best to organize more review sessions.

- Continuous updating of the course content by adding or deleting parts from the lecture according to the topic.

- The lecture notes should be given to the students before the lecture
- Midterms exams should be planned out of the course time so that we can profit better from this extra time in focusing on the lectures and review and practical work.

4. Processes for Verifying Standards of Student Achievement

- Review of the course delivered after the Final examinations.
- Review of course file in coordination with the Quality Centre (QC) nominee.
- Adopting suggestions of the QC for further improvement.
- Samples of students' assignments and exams are collected every semester and reviewed with faculty member

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Analysis of presence and regularity of students in class.
- Analysis of students' performance in all the examinations.
- Analysis of all examination score.
- Analysis of degree of interaction of students in class.
- Direct discussion with student during individual student consultations at office.
- Review of course-file at mid of semester.
- Review of course-report at the beginning of following semester.
- Analysis of student feedback at end of semester.
- Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Iskander.	***Name :***	.....
Signature :	.....	***Signature :***	.....
Date :	01/ 03 / 1437 *H*	***Date :***	…./ … / …… *H*

Institution:	College of Engineering
Academic Department :	Mech &Ind Engineering
Programme :	BS Mechanical Engineering
Course :	System Dynamics (ME 343)
Course Coordinator :	Dr. Chandra Mouli
Programme Coordinator :	Head of The Department

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	System Dynamics — Course Code: ME 343
2. Credit hours :	02
3 - Program(s) in which the course is offered:	Mechanical, Industrial
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	Dr. Chandra Mouli
6 - Level/year at which this course is offered :	07
7- Pre requisites: ME **242**	
8 - Co-requisites for this course (if any) : • **No co-requisite**	
9 - Location if not on main campus **:** **College of Engineering, Majmaah**	

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	x	What percentage?	90%
B - Blended (traditional and online)		What percentage?	
D - e-learning	x	What percentage?	10%
E - Correspondence		What percentage?	
F - Other		What percentage?	

Comments

Students can study the materials through e learning

B Objectives

What is the main purpose for this course?

- Students would be able to apply techniques for kinematics analyses of linkages
- Ability to understand various applications and inversions for motion dynamics.
- Able to use engineering skills, tools and techniques necessary for dynamic force analysis and responses to dynamic inputs.
- Understanding Mechanisms with actuators
- Ability to understand working and develop mechanical systems

Briefly describe any plans for developing and improving the course that are

being implemented :
Showing physical examples of various Mechanisms and their working

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Analytical and computer techniques for kinematic and dynamic analysis of linkages.	03	09
Inversions	01	03
Virtual links. Method of kinematic coefficients.	02	06
Geared linkages	03	09
System response to dynamic inputs	03	09
Mechanisms with actuators	03	09

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	0	0	0	45
Credit						02

3. Additional private study/learning hours expected for students per week.

02

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Able to apply kinematics and kinetics principles in addressing the dynamics of machines.	Class Room	Mid Term/Final Exam
1.2	Understand mechanics of components like gears/gear trains cams etc., for better interface and power transmissions to design engineering system.	Class Room	Mid Term/Quiz/Final Exam
1.3	Able to use engineering skills, tools and techniques necessary for dynamic force analysis and responses to dynamic inputs.	Class Room	Attendance/Quizzes/Home work/Final Exam
1.4	Understanding Mechanisms with actuators	Class Room	Attendance/Quizzes/Home work/Final Exam
1.5	Ability to understand working and develop mechanical systems.	Class Room	Mid Term/Quiz/Final Exam
2.0	**Cognitive Skills**		
2.1	Recognizing the applicability to apply the system dynamic principle for linkages of various mechanism	Class Room	Examinations
2.2	Solving and analyzing forces in complex mechanical components and mechanism.	Class Room	Assignments, Term Exams and Final Exam
3.0	**Interpersonal Skills & Responsibility**		
3.1	Interpretation of the data and applying system dynamic principles for the given mechanism	Homework	Revaluation
3.2	Participating in group discussions	Discussions	Interactive teaching
4.0	**Communication, Information Technology, Numerical**		
4.1	Defending the results and analysis of the assigned mechanisms	Discussions	Interactive teaching
5.0	**Psychomotor**		
5.3	**Not applicable**	.....	.....

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Quiz 1	03	05 Points
2	Assignment/Homework	05	05 Points
3	Mid Term 1	07	20 Points
4	Quiz 2	10	05 Points
5	Mid Term2	11	20 Points
6	Assignment/Home work	12	05 Points
7	Final Exam	15	40 Points
	Total		100 Points

D. Student Academic Counseling and Support

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E. Learning Resources

1. List Required Textbooks :
William J. Palm III, "System Dynamics," McGraw-Hill, 2005.

2. List Essential References Materials :
William J. Palm III, "System Dynamics," McGraw-Hill, 2005.

3. List Recommended Textbooks and Reference Material :
David H. Myszka, Machines and Mechanisms Applied Kinematic Analysis 4the Edition, Pearson

4. List Electronic Materials :
Majmaah university e learning website

5. Other learning material : • Nil

F. Facilities Required

1. Accommodation • **Class room**
2. Computing resources • **Not required**
3. Other resources • **E learning access**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: • **Feedback is being taken by the Administrative department**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor : • **Same will be continued**
3 Processes for Improvement of Teaching : **Existing process will be continued**
4. Processes for Verifying Standards of Student Achievement **Existing process will be continued**
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement : • **Time to time it will be reviewed with Programme co ordinator**

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		**Department Head**	
Name :	Dr Chandra Mouli	***Name : Dr***	Saleh Al Dahash
Signature :	.....	***Signature :***	.....
Date :	07/01/2016	***Date :***	…./ … / …… *H*

Institution:	.Majmaah University, KSA
Academic Department :	Department of Mechanical engineering
Programme :	Bachelor degree in Mechanical Engineering
Course :	Fluid mechanics (ME 353)
Course Coordinator :	.Dr. Mohammad Nadeem Khan
Programme Coordinator :	**Dr. Saleh Al Dahash**

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Fluid Mechanics. Course Code: ME- 353
2. Credit hours :	(4)
3 - Program(s) in which the course is offered:	Bachelor degree in Mechanical Engineering
4 – Course Language :	.English
5 - Name of faculty member responsible for the course:	Dr. Mohammad Nadeem Khan.
6 - Level/year at which this course is offered :	Level 7/First semester 2014-2015

7 - Pre-requisites for this course (if any) :

- .ME 252 Thermodynamics II

8 - Co-requisites for this course (if any) :

- N.A.

9 - Location if not on main campus : (Main Building of the College)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	√	What percentage?	05 %
D - e-learning	√	What percentage?	15 %
E - Correspondence	X	What percentage?	NIL %
F - Other	X	What percentage?	NIL %

Comments :

.....

B Objectives

What is the main purpose for this course?

- ✓ Student are ability to explain the basic concepts of fluid mechanics and recognize the various types of fluid flow problems encountered in practice, the continuum assumption and the no-slip condition.
- ✓ Student are ability to apply the fluid statics principles to calculate the pressure variation in a static fluid and calculate the forces exerted on plane and curved surfaces, and understand applications of manometers and other pressure-measuring devices.
- ✓ Student are ability to apply Bernoulli equation to different types of flow problems and understand the limitations of this equation.
- ✓ Student are ability to demonstrate a basic understanding of fluid flow kinematics and the

Eulerian/ Lagrangian descriptions of fluid flow.

- ✓ Student are ability to apply the Buckingham Pi theorem and recognize the importance of dimensional analysis in fluid mechanics.
- ✓ Student are ability to calculate losses in piping networks and pumping power requirements

Briefly describe any plans for developing and improving the course that are being implemented :

- ✓ Increased use of IT or web-based reference material and videos
- ✓ Consistently assign physical problems to students, as an application to theoretical contents

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Concepts and definitions	2	6
2. Fluid statics. Forces on submerged surfaces and bodies.	2	6
3. Non-viscous flow, conservation of mass, momentum and energy.	2	6
4. Bernoulli equation.	2	6
5. Dimensional analysis.	2	6
6. Viscous flow, pipe flow, losses in conduit flow.	3	9
7. Laminar and turbulent flow.	2	6

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15	30	NIL	NIL	60
Credit	3	NIL	1	NIL	NIL	4

3. Additional private study/learning hours expected for

NIL

students per week.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	This course contributes primarily to the students' knowledge of engineering topics, but does not provide design experience.	a. In-class lecturing where the previous knowledge is linked to the current and future topics, b. In-class discussions	Weekly homework assignments and Quizzes
1.2	At the end of course the student is supposed to develop the necessary skills to deal with fluid mechanics and its applications.	a. Tutorial discussions, b. conducting experiments (Lab Work), c. Solving problems through assignments on each topic,	Midterm exams and Final written exam
2.0	**Cognitive Skills**		
2.1	Thinking through problems solving, reasoning for each problem solved	Examples solving during the lecture and In-class discussion	Class participation and Formal Tests
2.2	Skill of communicating in Teams	Guiding Students in their Projects, Tutorial and Interactive problem solving with students	Homework assignments and Lab reports
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work in groups and independently and Manage resources, time and other members of the group	Solve the problems by asking sequential questions,	Homework Discussion and Evaluation,
3.2	Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour.	Conducting group experiments and writing group reports, Work in groups for solving certain problems.	Assessing communicative Skills.
4.0	**Communication, Information Technology, Numerical**		
4.1	Use of web internet and Use of PowerPoint and laptop – projector systems.	Writing Project/Lab reports,	Discussion, Questioning during topics.
4.2	Use of the advanced features in scientific calculators.	Incorporating the use and utilization of computer in the course requirements (electronic copy of the lectures was distributed).	Highlighting the concepts and principles through real life problems.
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Schedule of Assessment Tasks for Students during the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	6th week	20%
2	Second Major Exam	13th week	20%
3	Final Exam	Final exam week	40%
4	Assignments	Total four	20%

D. Student Academic Counseling and Support

- ✓ Weekly office hours
- ✓ Meetings and discussions on Blackboard/D2L

E. Learning Resources

1. List Required Textbooks :

Yunus A. Çengel and John M. Cimbala, "Fluid Mechanics, Fundamentals and Applications," 1st Ed, McGraw Hill higher Edu. 2005.

2. List Essential References Materials :

NA

3. List Recommended Textbooks and Reference Material :

Fundamentals of Fluid Mechanics, 5th Edition, B. R. Munson, D. F. Young, T. H. Okiishi, John Wiley & Sons, Inc., 2002.

4. List Electronic Materials :

NA

5. Other learning material :

NA

F. Facilities Required

1. Accommodation

c- Classroom
d- Laptop/ board/ broad marker

2. Computing resources

a- Laptop
b- projector system

3. Other resources

NA

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: Course Evaluation Survey filled by students
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor : Faculty Peer Assessment
3 Processes for Improvement of Teaching :
36. Processes for Verifying Standards of Student Achievement Samples of student works will be reviewed by another instructor assigned by the department.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement : The Improvement Loop details the steps of course and program improvement. The course reports will be reviewed every two years by the Course Report Committee and the recommendations will be passed to the department council for review and possible adaptation.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator
Name : Dr. Mohammad Nadeem Khan
Signature : .....
Date : …./ … / …… *H*

Department Head
Name : Dr. Saleh Al Dahash
Signature : .....
Date : …./ … / …… *H*

Institution:	*Majmaah University*.
Academic Department :	*Mechanical and Industrial Engineering*.
Programme :	*Bachelor in Mechanical and Industrial Engineering*.
Course :	*Refrigeration and Air Conditioning,(ME- 355)*.
Course Coordinator :	***Dr. Waqar hmed Khan***.
Programme Coordinator :	**Dr. Saleh Al Dahash**
Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title : *Thermodynamics I*	Course Code: *ME- 231*
2. Credit hours : *3 (2,1,2)*	
3 - Program(s) in which the course is offered: *Mechanical and Industrial Engineering*	
4 – Course Language : English	
5 - Name of faculty member responsible for the course:	***Dr. Waqar Ahmed Khan.***
6 - Level/year at which this course is offered :	*Third Year, F.S, / Level 8,2015-16*
7 - Pre-requisites for this course (if any) :	
8 - Co-requisites for this course (if any) :	
9 - Location if not on main campus : *(College of Engineering, Majmaah, University, Majmaah, KSA)*	

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	√	What percentage?	10%
D - e-learning	√	What percentage?	10 %
E - Correspondence	×	What percentage?	0 %
F - Other	×	What percentage?	0%

Comments :NO comments on it

B Objectives

What is the main purpose for this course?

This course aims to achieve the following objectives

1.Understand basic concepts of Thermodynamics and definitions of Energy and its forms

2. To know Phase transformation of pure substance

.

3. To understand laws of conservation of mass and energy

4. To Apply laws to closed system, steady flow system and unsteady system

Briefly describe any plans for developing and improving the course that are being implemented :

Better utilization of Thermodynamics laboratory so that students can experience the practical application of the theory of Thermodynamics

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Basic concepts of Thermodynamics and definitions. Processes and cycles.	2	4
Concept of thermodynamics Properties & definition of state	3	6
Working fluids: steam, ideal and real gases	3	6
Law of conservation of mass	2	4
First law of thermodynamics: concept and application	3	6
Second law of thermodynamics: concept and application	2	4

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	-	Nil	Nil	45
Credit	2	***1***	**-**	Nil	Nil	3

3. Additional private study/learning hours expected for students per week.

3*hr*s

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge (a, e ,k)**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.1	*An ability to apply principles of engineering, mathematics, and science in application of Engineering & Technology.*	*Lectures, tutorials and independent study assignments.*	*Home assignments of 10 points and Quizzes.Exam-1*
1.2	*Ability to model and solve engineering problems.*	*Animations of fundamentals of R.A.C and problems on it* *Power point presentation on different topic related to this subject*	*Examining the progress through Exam 1 and Exam 2, each of 15 points, Final exam*
1.3	*Ability to use engineering skills, tools and techniques necessary for engineering practices.*	*Individual assignments require use of library reference material and web sites to identify information required to complete tasks*S, Experiments	*Final assessment of the knowledge through final end term examination and lab reports of 15 points*
2.0	**Cognitive Skills**		
2.1	*Ability to think critically and analytically*	*Regularity during lecture classes is essential.*	*Class participation*
2.2	*Ability to develop tests in the areas covered at different levels.*	*Revising class instructions to keep up to date on the subject is key to learning*	*Peer/group response*
2.3	*Ability to produce test items in areas studied.*	*Time Management is always important to be free from burden of the subject*	*Lab reports*
2.4	*Time Management is always important to be free from burden of the subject.*	*Joint study sessions amongst students reduce doubts, promotes learning* *Solving the home*	*In-term and final.*

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		assignments and worksheets is needed for practice	
3.0	**Interpersonal Skills & Responsibility**		
3.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion and Evaluation*
3.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour Conducting group experiments and writing group reports, Work in groups for solving certain problems Assessing communicative Skills*	*Conducting group experiments and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.0	**Communication, Information Technology, Numerical**		
4.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion And Evaluation.*
4.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour*	*Conducting group discussion and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.3	*Use of web internet and Use of PowerPoint and laptop – projector systems*	*Writing Project/Lab reports*	*Discussion, Questioning during topics*
4.4	*Use of the advanced features in scientific calculators.*	*Incorporating the use and utilization of computer in the course requirements electronic copy of the lectures was distributed*	*Highlighting the concepts and principles through real life problems*
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	*First Major Exam*	*After 6th Week*	15
2	*Second Major Exam*	*After 12th Week*	15
3	*Final Exam*	*After 15th Week*	40
4	*Quizzes*	*Week 5,11*	7.5
5	*Homework assignments*	*Week 4, 6,12*	7.5
6	*Lab assignments*	*After 12th Week*	15

D. Student Academic Counseling and Support

• *SUNDAY*	• *10.00 A.M. TO 12.00 NOON*
• *MONDAY*	• *10.00 A.M. TO 12.00 NOON*
• *WEDNESDAY*	• *12.00 NOON TO 2.00 P.M.*

E. Learning Resources

1. List Required Textbooks :

- Thermodynamics an Engineering Approach by Cengel & Boles, McGraw Hills
- Engineering Thermodynamics, D.B. Spalding & E.H. Cole, Edward Arnold

2. List Essential References Materials :

- *NA*

3. List Recommended Textbooks and Reference Material :

- *As mentioned above*

4. List Electronic Materials :

- *Com Sol (Heat transfer, fluid flow)*

5. Other learning material :

- *Com Sol (Heat transfer, fluid flow)*
- *Thermo fluid software springer (Thermo fluid)*

F. Facilities Required

1. Accommodation

- *Lecture Rooms*

2. Computing resources

- *Proper projector system*

40. Other resources.

Nil

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- *Direct interaction with different groups of students.*
- *As per routine being practiced in the college.*
- *Course evaluation forms filled by students attending the course.*

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- *NA*

3 Processes for Improvement of Teaching :

- *Training for solving more exercise sessions.*
- *Workshops to facilitate the exchange of experiences amongst faculty members.*
- *Regular meetings where problems are discussed and solutions given.*
- *Attending professional development conferences.*
- *Industrial Interaction*

4. Processes for Verifying Standards of Student Achievement

- *Samples of students' assignments and exams are collected every semester and reviewed with faculty members.*
- *Examine students by basic concept questions on subject after completion of semester.*
- *Result of students also reflects the standard of knowledge.*
- *Group discussions on various subject topics should be conducted and assessed by the senior faculty member*

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- *Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.*

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr Waqar Ahmed Khan	***Name :***	**Dr. Saleh Al Dahash**
Signature :	.....	***Signature :***	.....
Date :	28/ 03 / 1437-38 *H*	***Date :***	28/ 03 / 1437-38 *H*

Institution:	College of Engineering
Academic Department :	Mech &Ind Engineering
Programme :	BS Mechanical Engineering
Course :	Automatic Control (ME 344)
Course Coordinator :	Dr. Chandra Mouli
Programme Coordinator :	Head of The Department
Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	System Dynamics — Course Code: ME 344
2. Credit hours :	02
3 - Program(s) in which the course is offered:	Mechanical, Industrial
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	Dr. Chandra Mouli
6 - Level/year at which this course is offered :	08
7- Pre requisites:	ME343, M353
8 - Co-requisites for this course (if any) :	• **No co-requisite**
9 - Location if not on main campus :	**College of Engineering, Majmaah**

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	x	What percentage?	95%
B - Blended (traditional and online)		What percentage?	
D - e-learning	x	What percentage?	5 %
E - Correspondence		What percentage?	
F - Other		What percentage?	

Comments

Students can study the materials uploaded in the Majmaah university e learning system

B Objectives

What is the main purpose for this course?

- Provide an overview of the modeling and analysis of classical control systems.
- An understanding of Block diagrams, State space equations of control systems, and Transfer function.
- The ability to construct Mathematical modeling of dynamic systems: Mechanical, electrical, electro-mechanical, liquid-level, thermal and pressure systems.
- Become familiar with types of industrial automatic controllers.

Briefly describe any plans for developing and improving the course that are being implemented :

Preparing the students to exercise some problems on their computers

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to Control Systems	01	03
The Laplace Transform	01	03
Mathematical Modeling of Dynamic Systems	01	03
Block Diagram Representation	02	06
Transient and Steady-State Response Analyses	02	06
Root-Locus Analysis	01	03
Control Systems Design by the Routh's stability and Root-Locus Method	02	06
Frequency-Response Analysis, Nyquist plot	02	06
Control Systems Design by Frequency Response	02	06
PID Controls	01	03

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	0	0	0	45
Credit						02

3. Additional private study/learning hours expected for students per week.

02

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Modelling of mechanical systems both translational and rotational Transient and steady state analysis of electrical and mechanical system.	Problem solving skills through practice and Rigor of hands on practice to solve problems Application of Matlab	Mid Term/Final Exam
1.2	Stability analysis of systems using frequency analysis Frequency analysis using polar plot, Nyquist plot. Design of PID controllers	Problem solving skills through practice and Rigor of hands on practice to solve problems	Mid Term/Quiz/Final Exam
2.0	**Cognitive Skills**		
2.1	Capabilities are developed to model basic mechanical systems	Allowing students to think to solve the problems in groups to exchange their thought and reinforce the correct.	Examinations
2.2	Check the system performance overshoot, over damped, under damped and Matlab commands	Asking them the formulas, equations used and how can they apply the knowledge for a specific type of problem and mending the mistakes with explanation	Assignments, Term Exams and Final Exam
2.3	An ability to recall and apply the concepts in solving problems. Students are asked to do and practice independently for longer retention period in mind thus practice oriented learning is valued.	Asking them the formulas, equations used and how can they apply the knowledge for a specific type of problem and mending the mistakes with explanation	Assignments, Term Exams and Final Exam
3.0	**Interpersonal Skills & Responsibility**		
3.1	Allocating group based assignment, giving challenging problems so that they share with classmates and teachers, help of internet for solving it.	Making the teaching learning two way communication. Getting students involved to solve problems and asking students did they understand the concept clearly.	Assignments, Term Exams and Final Exam
3.2	Group tasks, projects to work in teams	A seminar component related to topic may be considered	Assignments, Term Exams and Final Exam
4.0	**Communication, Information Technology, Numerical**		
4.1	Mathematical skills	Making students to exercise hands on practice during tutorial or computer	Interactive teaching

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		lab sessions.	
4.2	Problem solving skills	Assignments without direct input, but let them calculate inputs from source data	Interactive teaching
5.0	**Psychomotor**		
5.3	Not applicable		

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Quiz 1	03	05 Points
2	Assignment/Homework	05	05 Points
3	Mid Term 1	07	20 Points
4	Quiz 2	10	05 Points
5	Mid Term2	11	20 Points
6	Assignment/Home work	12	05 Points
7	Final Exam	15	40 Points
	Total		100 Points

D. Student Academic Counseling and Support

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E. Learning Resources

1. List Required Textbooks :

Katsuhiko Ogata, Modern control engineering, Pearson international edition, 2012

2. List Essential References Materials :

R L. Narasimhan, Analysis of Linear control system, I K international, 5th edition 2013.

3. List Recommended Textbooks and Reference Material :

Same as above.
4. List Electronic Materials : **Majmaah university e learning website**
5. Other learning material : I J Nagarath and Gopal, Control systems engineering, new age international publishers, reprint 2012. Proteus maintenance management software

F. Facilities Required

1. Accommodation • **Class room**
2. Computing resources • Students' Personal computers
3. Other resources • **E learning access**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: • **Feedback is being taken by the Administrative department**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor : • **Same will be continued**
3 Processes for Improvement of Teaching : **Existing process will be continued**
4. Processes for Verifying Standards of Student Achievement **Analysis of Students course learning outcomes**
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement : • **Time to time it will be reviewed with Programme coordinator**

Course Specification Approved

Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr Chandra Mouli	***Name :***	Dr Saleh Al Dahash
Signature :	.....	***Signature :***	.....
Date :	07/01/2016	***Date :***	…./ … / …… *H*

Institution:	.Majmaah University, KSA
Academic Department :	Department of Mechanical engineering
Programme :	Bachelor degree in Mechanical Engineering
Course :	Turbulent Flow (ME 356)
Course Coordinator :	.Dr. Mohammad Nadeem Khan
Programme Coordinator :	Head of Department
Course Specification Approved Date :	10/ 03 / 1437 H

A. Course Identification and General Information

1 - Course title : Turbulent Flow	Course Code: ME- 356
2. Credit hours : (3)	
3 - Program(s) in which the course is offered:	Bachelor degree in Mechanical Engineering
4 – Course Language : .English	
5 - Name of faculty member responsible for the course:	Dr. Mohammad Nadeem Khan.
6 - Level/year at which this course is offered :	Level 8/Third Year 2014-2015
7 - Pre-requisites for this course (if any) : • .ME 353 Fluid Mechanics	
8 - Co-requisites for this course (if any) : • N.A.	
9 - Location if not on main campus : (Main Building of the College)	

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	X	What percentage?	NIL %
D - e-learning	√	What percentage?	20 %
E - Correspondence	X	What percentage?	NIL %
F - Other	X	What percentage?	NIL %

Comments :

.....

B Objectives

What is the main purpose for this course?

An understanding of the definition, necessary backgournd and importance of the subject of Turbulent Flows, in addition to the abilty to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to:

- ✓ Understand and be able to use statistical description of turbulence,
- ✓ Understand phenomenological and analytical theories of turbulence,
- ✓ Be able to carry out necessary calculations concerning turbulent flows,
- ✓ Ability to follow a scientific methodology in using the basics and principles of mechanical engineering in handling engineering applications.

- ✓ Some of the knowledge and skills necessary to pursue professional careers in mechanical engineering arena.

Briefly describe any plans for developing and improving the course that are being implemented :

- ✓ Increased use of IT or web-based reference material
- ✓ Consistently assign physical problems projects to students, as an application to theoretical contents

C. Course Description

1. Topics to be covered

List of Topics	No. of Weeks	Contact Hours
Fundamentals of turbulent flows.	1-3	9
The basic equations and the characteristic scales, statistical description of turbulence.	4-6	9
Review of experimental results on the statistics and structure of turbulent flows.	7-9	9
Methods for calculation of turbulent flows; the problem of closure, semi-empirical, phenomenological and analytical theories of turbulence.	10-12	9
Large eddy and direct simulations of turbulence.	13-15	9

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15	NIL	NIL	NIL	60
Credit	03	NIL	NIL	NIL	NIL	03

3. Additional private study/learning hours expected for students per week.

NIL

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	All fields of engineering are basically full of machines and devices which are always in action and involve interrelated motions. We intend that the students may achieve a basic level of understanding of the operation of various engines and may be able to deal with study of various engine systems as well. The students, at the end of the course, should be able to use this subject information for future research & development in higher studies. In fact, knowledge of engine operation and combustion is a must as it is the most important part of every engine design problem. Hence, the subject also deals with the physics involved in engine design.	• Further motivating students by slowly starting with simple explanations and simple problems and then moving towards complex areas of the subject. • Discussing common day to day applications of the subject. (Demonstrated practically if possible with few of the topics.) • Initially asking the students simple questions on the subject and then highly appreciating their understanding aptitude. • Lecture notes • Power point presentation • Interactive CD-ROMs, textbook, • Discussion board • Emails: I try to respond to all emails within a 24 hour time period. If you do not get a reply from me within 24 hours please resend message.	Mid Term I : 20 Point Mid Term II : 20 Point Final Term : 40 Point Home assignments 20 Point Total 100 Points
	Cognitive Skills		
2.1	Ability to think critically and analytically. Ability to interpret results of oriented problems, whether physically or mathematically	**Have perfect attendance:** Don't miss lecture or lab. This is the first thing students from previous semesters offer for advice. There is simply too much material covered too rapidly to catch up if you get behind. Print off the note taking pages for the chapters we will cover in class each day. Keep up by studying regularly. Read the chapters and note taking pages before you come to lecture. You will not succeed in this course if you wait until the day before an exam to study. You must drill on the material as it is presented. Manage your time well: schedule study time every day. Cooperative learning works: research has shown that students who study with other students usually perform better on exams. This can be difficult but it is worth the effort. From a small (2, 3 or 4 students) Study group and get together to work on	➢ Promoting and shaping projects originating from students' mind. ➢ Organizing students' seminars where the topics already taught can be used by the students to deliver a lecture. ➢ Planning surveys of various types to gather subject information in an organized statistical form and giving self-analysis based on the data collected. ➢ Deputing students on each individual test/experimental setup for its running and up keep. ➢ Developing simple demonstration equipment to show simple concepts of the subject and also for use in the laboratory or elsewhere. ➢ Article writing or even book writing can be one of the areas to explore. ➢ Starting students' chapters of various International societies for students to run the activities of the society.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		review questions at the end of each section and chapter.	
3.0	**Interpersonal Skills & Responsibility**		
3.1	➢ Students can complete all assignments in due time ➢ Students can participate in class discussion and think critically ➢ Students can act responsibly and ethically in carrying out individual as well as group projects ➢ Students have the necessary skills to communicate, listen, negotiate, and evaluate their strengths and weaknesses as members of a team ➢ Students have the necessary skills to defend their points of view and/or proposed solution to any problem based on the acquired knowledge. ➢ Students have the necessary skills to evaluate peers' answers and solutions, point and correct their mistakes	Lectures in which students are made aware of the significance of time management Discussions with students on ethical behaviour in conducting research Individual counselling on research projects and subject matter difficulties. Group assignments where much of the most effective learning comes from the student explaining, discussing and defending her own ideas with her peers. Break a chapter into manageable chunks: Once the student read an entire chapter break up the text into three-four sections. Read and underline one section at a time before moving on to the next section. Utilize review tools in the text book: One the student read and underlined the chapter; he should follow this by going directly to the review questions at the end of the sections. This is an important way to test his knowledge. Students have to figure out what his learning style is, and fit his study approaches to that style. Students are expected to develop certain teamwork activities regarding the theoretical part.	➢ Active class participation reflects the students ability to keep up with the concealed math ideas ➢ Homework assignments will attest to the student's ability to fulfil required tasks and respect deadlines ➢ Performance on midterms and final exams are evidence of the student's ability to recollect and synthesize information. ➢ Instructor's assessment of student's performance and seriousness during individual practice hours
4.0	**Communication, Information Technology, Numerical**		
4.1	➢ Use of Mathematical package and such IC Engine software. ➢ Use of web internet. ➢ Use of PowerPoint and laptop – projector systems. ➢ Use of the advanced features in scientific calculators.	Encourage students to consult the specialist in the computer lab for help on web-based material Demand the use of PowerPoint when giving presentations in projects Solving lots of problems using software. Students will be asked to deliver summary regarding certain topics related to the course. Students will be asked to prepare and present subjects using different educational strategies (power point presentation, projections…) Each student is expected to prepare and present one issue regarding to the course.	Some marks for the use of web-based material in students' presentations. Distribute some marks in every assigned project so students know what they will be evaluated on Set marks for the PowerPoint presentation students create to give their presentations, its content and their presentation skills. Set marks in doing lots of solving problems using software.
5.0	**Psychomotor**		
5.1	Not Applicable	Not Applicable	Not Applicable

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	6th week	20%
2	Second Major Exam	13th week	20%
3	Final Exam	Final exam week	40%
4	Assignments	Total four	20%

D. Student Academic Counseling and Support

Due support to solve the problems faced by the students while doing their self study is a must. In view of this the students are free to access the teaching staff as and when required during the free time of the concerned teacher.

To be specific and bounding following slots are allotted every week for the students to contact in the office of the concerned instructor of TF:

Sunday to Thursday : 8.00 am to 2.00 pm

E. Learning Resources

1. List Required Textbooks :

Turbulent Flows, S. B. Pope, Cambridge University Press. Edition 2008.

2. List Essential References Materials :

An Introduction to Turbulent Flow, Jean Mathieu, Julian Scott, Cambridge University Press (June 26, 2000)

3. List Recommended Textbooks and Reference Material :

None

4. List Electronic Materials :

http://ocw.mit.edu/courses/mechanical-engineering/2-27-turbulent-flow-and-transport-spring-2002

5. Other learning material :

- MS Excel
- CFD software

F. Facilities Required

1. Accommodation

- Classroom
- Developing a laboratory where simple demonstration to show the experimental validation of theory should be developed.

2. Computing resources.

Computer lab

3. Other resources

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Interactive learning in the class.
- Course evaluation questionnaire

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

Direct discussion, of the authorities concerned, with students during students' Interactive sessions/meetings

3 Processes for Improvement of Teaching :

- Discussions and explanation on subject citing real life examples and problems.
- Absorbing information as concepts and illustrating applications to problems.
- Solving problems through assignments on each topic.
- Providing notes on lectures delivered.
- Reviving a thinking process while delivering lectures in the class room.

4. Processes for Verifying Standards of Student Achievement

- Review of the course delivered after the Final examinations.
- Reviews of course file in coordination with the Quality Centre (QC) nominee.
- Adopting suggestions of the QC for further improvement.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Analysis of presence and regularity of students in class.
- Analysis of students' performance in all the examinations.
- Analysis of all examination score.
- Analysis of degree of interaction of students in class.
- Direct discussion with student during individual student consultations at office.
- Review of course-file at mid of semester.
- Review of course-report at the beginning of following semester.
- Analysis of student feedback at end of semester.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	.....	***Name :***	Dr Saleh Aldahash.
Signature :	.....	***Signature :***	.....
Date :	…./ … / …… *H*	***Date :***	…./ … / …… *H*

Institution:	Majmaah University.
Academic Department :	Dept. Mechanical & Industrial engineering.
Programme :	Mechanical & Industrial engineering.
Course :	Membrane desalination processes ME 357
Course Coordinator :	Iskander.
Programme Coordinator :	Dr Saleh Aldahash.
Course Specification Approved Date :	01/ 03 / 1437 H

A. Course Identification and General Information

1 - Course title :	Internal Combustion Engines. Course Code: ME 459
2. Credit hours :	2 (2,1,0)
3 - Program(s) in which the course is offered:	Bachelor degree: Mechanical & Industrial engineering Program.
4 – Course Language :	Eng.
5 - Name of faculty member responsible for the course:	Iskander.
6 - Level/year at which this course is offered :	Third year / Level 8

7 - Pre-requisites for this course (if any) :

- ME 354

8 - Co-requisites for this course (if any) :

- None

9 - Location if not on main campus :

(.....)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	95 %
B - Blended (traditional and online)		What percentage?	..... %
D - e-learning	√	What percentage?	3 %
E - Correspondence	√	What percentage?	2 %
F - Other		What percentage?	..... %

Comments :

.....

B Objectives

What is the main purpose for this course?

An understanding of the definition, necessary backgournd and importance of the subject of Membrane Desalination Processes, in addition to the abilty to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to:

i. Understand types of desalinations processes, system operation, and membrane technology,
ii. Become familiar with different membrane processes and equipments.
iii. Be able to design a membrane system, and carrying out all necessary calculations.
iv. Ability to follow a scientific methodology in using the basics and principles of mechanical engineering in handling engineering applications

Briefly describe any plans for developing and improving the course that are

being implemented :
.....

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction, Intake, pumping, Filtration.	1	2
Ion exchange, pretreatment, Membranes.	2	2
Membrane technology.	3-5	6
Reverse Osmosis systems (RO) principles.	6-8	6
RO membranes characteristics, system design	9-11	6
Electrodialysis (ED).	12	2
Other membrane processes, introduction to fouling.	13-14	4
Computer applications.	15	2
.....	.....	.....

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**30**	**15**	0	0		45
Credit	2	1	0	0		2

3. Additional private study/learning hours expected for students per week.

.. Minimum 2 to 3 Hours per week for the subject is sufficient for the students..

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	We intend that the students may achieve a basic level of understanding of the membrane desalination process and may be able to deal with study of various types of desalination systems as well. The students, at the end of the course, should be able to use this subject information for future research & development in higher studies. In fact, knowledge of MD and the design of MD system is a must as it is the most important part of every MD design problem. Hence, the subject also deals with the physics involved in MD design.	-Experience has shown that this subject has always been a source of attraction and motivation to the students. Following strategies or steps are planned to motivate students towards self-learning process as well: -Further motivating students by slowly starting with simple explanations and simple problems and then moving towards complex areas of the subject. -Discussing common day to day applications of the subject. (Demonstrated practically if possible with few of the topics.) -Initially asking the students simple questions on the subject and then highly appreciating their understanding aptitude.	Mid Term I : 20 Point Mid Term II : 20 Point Final Term : 40 Point Home assignments & Quiz 20 Points Total 100 Points
2.0			

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.1	The basic mental skills to be targeted include Relaxation and self-talk, Mental rehearsal, Concentration, Goal-setting.	**Removing Subject Paranoia:** The subject paranoia need to be removed from the minds of students by first dealing with common events in our daily life related to the subject. This leads to a relaxed mind ready and receptive to information. **Converting Information to a Conceptual Belief:** Any information received is just useless until it becomes a belief. Our brain receives an information, frames it and subsequently our mind analyses it. Process of analysis is a must as it rehearses the printed image of information again and again to match it with similar problem statements. Similarly, otherwise, if a new problem statement is posed the mind takes the previous information from the brain, scans it and analyses it for a solution. **Authenticity of the Source Of Information & Clarity in the Method Of Transfer Of Information:** For concentration of the brain on any subject we need a source of information which is reliable and also it is very important that the method of transfer of information is crystal clear. If the pasted information on the brain is blur the mind cannot do a correct analysis rather the concentration is lost in the subject. Seeing is believing: demonstrating simple experiments make the imagination more strong and this stamps a clear picture on the brain which reflects back again and again whenever it comes across similar problem statement. This trains the mind to use the information pasted on the brain and activate the inherent mental abilities with in every learner. **Concepts Motivate for Action to achieve Goals:** When information takes shape of a belief it becomes a concept. A conceptual mind is always active, instructive and originates motivation. Motivation leads to a thought process and the targets and goals are set for action.	This is an important task. Assessment can be done using non-conventional and convention methods, both. Non-Conventional techniques require very close associative bond with each student. Every student has his own ingenuity where his creativity can be shaped. All techniques to assess should be optional and student can opt for any one activity. This brings out his decision making capability where he judges his comfort zone to participate and use his inherent mental abilities. -Promoting and shaping projects originating from students' mind. -Organizing students' seminars where the topics already taught can be used by the students to deliver a lecture. -Planning surveys of various types to gather subject information in an organized statistical form and giving self-analysis based on the data collected. -Deputing students on each individual test/experimental setup for its running and up keep. -Developing simple demonstration equipment to show simple concepts of the subject and also for use in the laboratory or elsewhere. -Article writing or even book writing can be one of the areas to explore. -Starting students' chapters of various International societies for students to run the activities of the society. In fact, I personally used all these techniques regularly on 30 to 40 % of my students in class at mid-level of their under graduate course. The results were extra ordinary as this

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
			helped me to develop my own self too along with the students.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.0	**Interpersonal Skills & Responsibility**		
3.1	• Students can complete all assignments in due time • Students can participate in class discussion and think critically • Students can act responsibly and ethically in carrying out individual as well as group projects • Students have the necessary skills to communicate, listen, negotiate, and evaluate their strengths and weaknesses as members of a team • Students have the necessary skills to defend their points of view and/or proposed solution to any problem based on the acquired knowledge. • Students have the necessary skills to evaluate peers' answers and solutions, point and correct their mistakes	• Lectures in which students are made aware of the significance of time management • Discussions with students on ethical behaviour in conducting research • Individual counselling on research projects and subject matter difficulties. - Group assignments where much of the most effective learning comes from the student explaining, discussing and defending her own ideas with her peers. **- Break a chapter into manageable chunks**: Once the student read an entire chapter break up the text into three-four sections. Read and underline one section at a time before moving on to the next section. **- Utilize review tools in the text book**: One the student read and underlined the chapter; he should follow this by going directly to the review questions at the end of the sections. This is an important way to test his knowledge. - Students have to figure out what his learning style is, and fit his study approaches to that style. - Students are expected to develop certain teamwork activities regarding the theoretical part.	Active class participation reflects the students ability to keep up with the concealed math ideas Homework assignments will attest to the student's ability to fulfil required tasks and respect deadlines Performance on midterms and final exams are evidence of the student's ability to recollect and synthesize information. Instructor's assessment of student's performance and seriousness during individual practice hours

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.0	**Communication, Information Technology, Numerical**		
4.1	Use of Mathematical package and such Membrane desalination software. Use of web internet. Use of PowerPoint and laptop – projector systems. Use of the advanced features in scientific calculators.	Encourage students to consult the specialist in the computer lab for help on web-based material Demand the use of PowerPoint when giving presentations in projects Solving lots of problems using software. Students will be asked to deliver summary regarding certain topics related to the course. Students will be asked to prepare and present subjects using different educational strategies (power point presentation, projections…) Each student is expected to prepare and present one issue regarding to the course.	Some marks for the use of web-based material in students' presentations. Distribute some marks in every assigned project so students know what they will be evaluated on Set marks for the PowerPoint presentation students create to give their presentations, its content and their presentation skills. Set marks in doing lots of solving problems using software.
5.0	**Psychomotor**		
5.1	**.....** **.....** **.....** **...**	……	……
5.2	**.....** **.....** **.....** **...**	……	……
5.3	**.....** **.....** **.....** **...**	……	……
5.4	**.....** **.....** **.....** **...**	……	……
5.5	**.....** **.....** **.....** **...**	……	……

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	HW, CW & Quiz Test-I	3rd/4th week	05
2	Mid Term I	7th week	20
3	HW, CW & Quiz Test-II	9th/10th week	05
4	Mid Term II	13th week	20
5	HW, CW & Quiz Test-III	14th week	05
6	project evaluation	15th week	05
7	Final Term	16th week	40
8	Total	……	100%

D. Student Academic Counseling and Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week):

Due support to solve the problems faced by the students while doing their self-study is a must. In view of this the students are free to access the teaching staff as and when required during the free time of the concerned teacher.

To be specific and bounding following slots are allotted every week for the students to contact in the office of the concerned instructor of thermodynamics:

3. Monday: 10.00 am to 12.00am
4. Wednesday: 9.00 am to 10.00am

weekly office hours

E. Learning Resources

1. List Required Textbooks :

Engineering Systems for Desalination, M.A. Darwish, A. El-Sayed, M. El-Sayed, S.E. Aly, King AbduAlaziz Univ, 1995.

- Fundamentals of Water Desalination, E.D. Howe, Marcel Dekker.

2. List Essential References Materials :

-

3. List Recommended Textbooks and Reference Material :

- Fundamentals of Salt Water Desalination H.T. El-Dessouky & H.M. Ettouney, Elsevier 2002..
- ……
- ……

4. List Electronic Materials :

- http://www.sustainable-desalination.net/courses/
- ……

5. Other learning material :

- MS Excel
- membrane software……

F. Facilities Required

1. Accommodation

- Accommodation (Lecture rooms, laboratories, etc.):
- Classroom
- Developing a laboratory where simple demonstration to show the experimental validation of theory should be developed.
-
- .....
- .....

2. Computing resources

- Laptop computer
-

3. Other resources

- .....
- .....
- .....

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Interactive learning in the class.
- Course evaluation questionnaire
- Forms are filled by all students who attend the course.....

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

Direct discussion, of the authorities concerned, with students during students' Interactive sessions/meetings.

3 Processes for Improvement of Teaching :

- Discussions and explanation on subject citing real life examples and problems.
- Absorbing information as concepts and illustrating applications to problems.
- Solving problems through assignments on each topic.
- Providing notes on lectures delivered.

Reviving a thinking process while delivering lectures in the class room.

4. Processes for Verifying Standards of Student Achievement

- Review of the course delivered after the Final examinations.
- Review of course file in coordination with the Quality Centre (QC) nominee.
- Adopting suggestions of the QC for further improvement.
- Samples of students' assignments and exams are collected every semester and reviewed with faculty member

5 Describe the planning arrangements for periodically reviewing course

effectiveness and planning for improvement :

- Analysis of presence and regularity of students in class.
- Analysis of students' performance in all the examinations.
- Analysis of all examination score.
- Analysis of degree of interaction of students in class.
- Direct discussion with student during individual student consultations at office.
- Review of course-file at mid of semester.
- Review of course-report at the beginning of following semester.
- Analysis of student feedback at end of semester.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Iskander.	***Name :***	Dr Saleh Aldahash.
Signature :	.....	***Signature :***	.....
Date :	01/ 03 / 1437 *H*	***Date :***	…./ … / …… *H*

Institution:	**Faculty of Engineering**
Academic Department :	**Mechanical and Industrial Engineering**
Programme :	Mechanical and industrial Engineering
Course :	Quality Management.
Course Coordinator :	Dr Chandra Hakim
Programme Coordinator :	Dr Saleh Aldahash.

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Quality management
Course Code:	ME 372
2. Credit hours :	03
3 - Program(s) in which the course is offered:	1. Mechanical and Industrial Engg
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	Dr Chandra Hakim
6 - Level/year at which this course is offered :	**08**

7 - Pre-requisites for this course (if any) :

- **STAT 201**

8 - Co-requisites for this course (if any) :

- .....

9 - Location if not on main campus **:**

(.....)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	**80 %**
B - Blended (traditional and online)	√	What percentage?	**10 %**
D - e-learning	√	What percentage?	**10 %**
E - Correspondence		What percentage?	**..... %**
F - Other		What percentage?	**..... %**

Comments :

.....

B Objectives

What is the main purpose for this course?

- Gain knowledge of: Basic elements of a Quality Management System (QMS); International standards, Become able to apply basic methods of statistical process control (SPC) as problem solving tools and methods for process capability analysis and statistical inferences, Understand different quality improvement tools (Quality function deployment. Quality circles. Quality loss functions).

Briefly describe any plans for developing and improving the course that are

being implemented :
Use of computer applications like MS excel and Mini Tab

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction: Definition of quality, Characteristics of Quality, Dimensions of quality, Quality planning, Quality costs – Value of Quality, Cost of Quality Vs Value of Quality	01	04
Total Quality Management: Basic concepts of total quality management – Historical review – Principles of TQM – Concepts – Quality council – Quality statements –Strategic planning – Barriers to TQM implementation.	02	08
Statistical Quality Control: The seven tools of quality – Statistical fundamentals – Measures of central tendency and dispersion – Population and sample – Normal curve – Control charts for variables and attributes – Process capability analysis– Concept of six sigma –	04	16
Acceptance Sampling, Operating characteristics curve, Outgoing quality levels, Sampling plans, Single, Double and Multiple sampling plans	03	12
TQM Tools: Benchmarking – Reasons to benchmarking-Benchmarking process-Quality Function deployment (QFD)-Quality Circles– QFD process-Benefits Taguchi quality loss function – Total Productive Maintenance (TPM)0	03	12
Quality Systems: Need for ISO 9000 and other quality systems – ISO 9000:2000 Quality system – Elements – Implementation of quality system – Documentation – Quality auditing – TS 16949 – ISO 14000 –Concept – Requirements and benefits.	02	08
.....	.....	.....
.....	.....	.....

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**45**	15	.....	.....	.....	**60**

Credit	**03**	.....	.....	.....	.....	.....

3. Additional private study/learning hours expected for students per week.

.....

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Become able to apply basic methods of statistical process control (SPC) tools for process capability analysis and process control	Interactive learning with real time feedback Assignment to solve problems during exercise and at home	Assignments to think and refresh the concepts and solve the problems independently. There are tests after every topic, term#1, term#2, and quizzes to check their knowledge and give feedback for deficiency
1.2	Ability to carryout analysis of statistical inferences	Through hands on exercise and practice	Assignments and quizzes.
1.3	Use of computer to solve statistical parameters.		Home work
1.4	Ability to Function on multi-disciplinary teams for quality improvement, and seeking information for implementation of quality standards .	Giving them small part of big problem at one time so solving part by part and then summarizing the whole	Question answer session Making students to exercise hands on experience during tutorial period
1.5			
1.6	**.....**	.....	.....
2.0	**Cognitive Skills**		
2.1	Use the techniques, skills, and modern engineering tools necessary for engineering practice.	Emphasis on practice based learning. Always citing the application in real life to create interest	Checking their knowledge during class on regular basis Asking the students prior to solving the problem to sensitize them and awaken the curiosity.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.2	....	.....	.....
2.6	....	.....	.....
3.0	**Interpersonal Skills & Responsibility**		
3.1	....	.....	.....
3.2	....	.....	.....
3.3	....	.....	.....
3.4	....	.....	.....
4.0	**Communication, Information Technology, Numerical**		
4.1	....	.....	.....
4.2	....	.....	.....
5.0	**Psychomotor**		
5.1	....	.....	.....

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	6th	20
2	Second Major Exam	11th	20
3	Final Exam	14th	40
4	Quiz	6th and 12th week	10
5	Homework and assignments	4th an 10th week	10
6	.....	.....	.....

D. Student Academic Counseling and Support

- The office hour is earmarked to interact with teacher regarding problem related to subject.
- Material is uploaded on D2L to help students

E. Learning Resources

1. List Required Textbooks :

1) Introduction to Statistical Quality Control, Douglus C Montgomery, John Wiley &Sons, 2001.

2) Quality Planning & Analysis, J M Juran & F M Gryna, Mc Graw-Hill, International Editions, 1993.

2. List Essential References Materials :

- Besterfiled, D.H. Total Quality Management, Pearson Education, Inc. 2003.
- Zeiri. Total Quality Management for Engineers, Wood Head Publishers, 1991.
- Evans, J. R., and Lidsay, W.M., The Management and Control of Quality, 5th Edition, South-Western (Thomson Learning), 2002
- Oakland .J.S. Total Quality Management, Butterworth – Heinemann Ltd., Oxford, 1989.

3. List Recommended Textbooks and Reference Material :

- NA
- ……

4. List Electronic Materials:

- e-books are available on D2L
- ……
- ……

5. Other learning material :

- Net surfing for projects
- ……
- ……

F. Facilities Required

1. Accommodation

- Lecture room is available
- ……

2. Computing resources

- Computer lab and personal laptops are available and LCD projectors are available in class rooms
- ……

3. Other resources

- AN

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Students should make fair assessment of how course learning can be made more effective.
- They should be told that this is used for improving the teaching learning process so give your candid and honest information

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- Always asking students during the course of delivery, did they understood the concept, method or steps involved in solving the problem.
- Making white board management proper to allow them taking notes
- The writing must be very clear and meaningful

3 Processes for Improvement of Teaching :

- NA
- ……
- ……

4. Processes for Verifying Standards of Student Achievement

- AN.....……
- ……

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Assessing KPI and reviewing the course delivery mechanism
- ……

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr Chandra Hakim	***Name :***	Dr Saleh Aldahash.
Signature :	.....	***Signature :***	.....
Date :	28/03 /1437/*H*	***Date :***	28/03 /1437/*H*

Institution:	Majmaah University.
Academic Department :	Dept. Mechanical & Industrial engineering.
Programme :	Mechanical & Industrial engineering.
Course :	Membrane desalination processes ME 357
Course Coordinator :	Iskander.
Programme Coordinator :	**Dr. Saleh Al Dahash**

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Internal Combustion Engines. Course Code: ME 459
2. Credit hours :	2 (2,1,0)
3 - Program(s) in which the course is offered:	Bachelor degree: Mechanical & Industrial engineering Program.
4 – Course Language :	Eng.
5 - Name of faculty member responsible for the course:	Iskander.
6 - Level/year at which this course is offered :	Third year / Level 8

7 - Pre-requisites for this course (if any) :

- ME 354

8 - Co-requisites for this course (if any) :

- None

9 - Location if not on main campus :

(.....)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	95 %
B - Blended (traditional and online)		What percentage?	..... %
D - e-learning	√	What percentage?	3 %
E - Correspondence	√	What percentage?	2 %
F - Other		What percentage?	..... %

Comments :

.....

B Objectives

What is the main purpose for this course?

An understanding of the definition, necessary backgournd and importance of the subject of Membrane Desalination Processes, in addition to the abilty to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to:

v. Understand types of desalinations processes, system operation, and membrane technology,
vi. Become familiar with different membrane processes and equipments.
vii. Be able to design a membrane system, and carrying out all necessary calculations.
viii. Ability to follow a scientific methodology in using the basics and principles of mechanical engineering in handling engineering applications

Briefly describe any plans for developing and improving the course that are being implemented :

.....

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction, Intake, pumping, Filtration.	1	2
Ion exchange, pretreatment, Membranes.	2	2
Membrane technology.	3-5	6
Reverse Osmosis systems (RO) principles.	6-8	6
RO membranes characteristics, system design	9-11	6
Electrodialysis (ED).	12	2
Other membrane processes, introduction to fouling.	13-14	4
Computer applications.	15	2
.....	.....	.....

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**30**	**15**	0	0		45
Credit	2	1	0	0		2

3. Additional private study/learning hours expected for students per week.

.. Minimum 2 to 3 Hours per week for the subject is sufficient for the students..

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	We intend that the students may achieve a basic level of understanding of the membrane desalination process and may be able to deal with study of various types of desalination systems as well. The students, at the end of the course, should be able to use this subject information for future research & development in higher studies. In fact, knowledge of MD and the design of MD system is a must as it is the most important part of every MD design problem. Hence, the subject also deals with the physics involved in MD design.	-Experience has shown that this subject has always been a source of attraction and motivation to the students. Following strategies or steps are planned to motivate students towards self-learning process as well: -Further motivating students by slowly starting with simple explanations and simple problems and then moving towards complex areas of the subject. -Discussing common day to day applications of the subject. (Demonstrated practically if possible with few of the topics.) -Initially asking the students simple questions on the subject and then highly appreciating their understanding aptitude.	Mid Term I : 20 Point Mid Term II : 20 Point Final Term : 40 Point Home assignments & Quiz 20 Points Total 100 Points

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.0			
2.1	The basic mental skills to be targeted include Relaxation and self-talk, Mental rehearsal, Concentration, Goal-setting.	**Removing Subject Paranoia:** The subject paranoia need to be removed from the minds of students by first dealing with common events in our daily life related to the subject. This leads to a relaxed mind ready and receptive to information. **Converting Information to a Conceptual Belief:** Any information received is just useless until it becomes a belief. Our brain receives an information, frames it and subsequently our mind analyses it. Process of analysis is a must as it rehearses the printed image of information again and again to match it with similar problem statements. Similarly, otherwise, if a new problem statement is posed the mind takes the previous information from the brain, scans it and analyses it for a solution. **Authenticity of the Source Of Information & Clarity in the Method Of Transfer Of Information:** For concentration of the brain on any subject we need a source of information which is reliable and also it is very important that the method of transfer of information is crystal clear. If the pasted information on the brain is blur the mind cannot do a correct analysis rather the concentration is lost in the subject. Seeing is believing: demonstrating simple experiments make the imagination more strong and this stamps a clear picture on the brain which reflects back again and again whenever it comes across similar problem statement. This trains the mind to use the information pasted on the brain and activate the inherent mental abilities with in every learner. **Concepts Motivate for Action to achieve Goals:** When information takes shape of a belief it becomes a concept. A conceptual mind is always active, instructive and originates motivation. Motivation leads to a thought process and the targets and goals are set for action.	This is an important task. Assessment can be done using non-conventional and convention methods, both. Non-Conventional techniques require very close associative bond with each student. Every student has his own ingenuity where his creativity can be shaped. All techniques to assess should be optional and student can opt for any one activity. This brings out his decision making capability where he judges his comfort zone to participate and use his inherent mental abilities. -Promoting and shaping projects originating from students' mind. -Organizing students' seminars where the topics already taught can be used by the students to deliver a lecture. -Planning surveys of various types to gather subject information in an organized statistical form and giving self-analysis based on the data collected. -Deputing students on each individual test/experimental setup for its running and up keep. -Developing simple demonstration equipment to show simple concepts of the subject and also for use in the laboratory or elsewhere. -Article writing or even book writing can be one of the areas to explore. -Starting students' chapters of various International societies for students to run the activities of the society. In fact, I personally used all these techniques regularly on 30 to 40 % of my students in class at mid-level of their under

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
			graduate course. The results were extra ordinary as this helped me to develop my own self too along with the students.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.0	**Interpersonal Skills & Responsibility**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.1	• Students can complete all assignments in due time • Students can participate in class discussion and think critically • Students can act responsibly and ethically in carrying out individual as well as group projects • Students have the necessary skills to communicate, listen, negotiate, and evaluate their strengths and weaknesses as members of a team • Students have the necessary skills to defend their points of view and/or proposed solution to any problem based on the acquired knowledge. • Students have the necessary skills to evaluate peers' answers and solutions, point and correct their mistakes	• Lectures in which students are made aware of the significance of time management • Discussions with students on ethical behaviour in conducting research • Individual counselling on research projects and subject matter difficulties. - Group assignments where much of the most effective learning comes from the student explaining, discussing and defending her own ideas with her peers. **- Break a chapter into manageable chunks**: Once the student read an entire chapter break up the text into three-four sections. Read and underline one section at a time before moving on to the next section. **- Utilize review tools in the text book**: One the student read and underlined the chapter; he should follow this by going directly to the review questions at the end of the sections. This is an important way to test his knowledge. - Students have to figure out what his learning style is, and fit his study approaches to that style. - Students are expected to develop certain teamwork activities regarding the theoretical part.	Active class participation reflects the students ability to keep up with the concealed math ideas Homework assignments will attest to the student's ability to fulfil required tasks and respect deadlines Performance on midterms and final exams are evidence of the student's ability to recollect and synthesize information. Instructor's assessment of student's performance and seriousness during individual practice hours
4.0	**Communication, Information Technology, Numerical**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.1	Use of Mathematical package and such Membrane desalination software. Use of web internet. Use of PowerPoint and laptop – projector systems. Use of the advanced features in scientific calculators.	Encourage students to consult the specialist in the computer lab for help on web-based material Demand the use of PowerPoint when giving presentations in projects Solving lots of problems using software. Students will be asked to deliver summary regarding certain topics related to the course. Students will be asked to prepare and present subjects using different educational strategies (power point presentation, projections…) Each student is expected to prepare and present one issue regarding to the course.	Some marks for the use of web-based material in students' presentations. Distribute some marks in every assigned project so students know what they will be evaluated on Set marks for the PowerPoint presentation students create to give their presentations, its content and their presentation skills. Set marks in doing lots of solving problems using software.
5.0	**Psychomotor**		
5.1	**.....**	……	……
5.2	**.....**	……	……
5.3	**.....**	……	……
5.4	**.....**	……	……
5.5	**.....**	……	……

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	HW, CW & Quiz Test-I	3rd/4th week	05
2	Mid Term I	7th week	20
3	HW, CW & Quiz Test-II	9th/10th week	05
4	Mid Term II	13th week	20
5	HW, CW & Quiz Test-III	14th week	05
6	project evaluation	15th week	05
7	Final Term	16th week	40
8	Total	……	100%

D. Student Academic Counseling and Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week):

Due support to solve the problems faced by the students while doing their self-study is a must. In view of this the students are free to access the teaching staff as and when required during the free time of the concerned teacher.

To be specific and bounding following slots are allotted every week for the students to contact in the office of the concerned instructor of thermodynamics:

5. Monday: 10.00 am to 12.00am
6. Wednesday: 9.00 am to 10.00am

weekly office hours

E. Learning Resources

1. List Required Textbooks :

Engineering Systems for Desalination, M.A. Darwish, A. El-Sayed, M. El-Sayed, S.E. Aly, King AbduAlaziz Univ, 1995.

- Fundamentals of Water Desalination, E.D. Howe, Marcel Dekker.

2. List Essential References Materials :

-

3. List Recommended Textbooks and Reference Material :

- Fundamentals of Salt Water Desalination H.T. El-Dessouky & H.M. Ettouney, Elsevier 2002..
- ……
- ……

4. List Electronic Materials :

- http://www.sustainable-desalination.net/courses/
- ……

5. Other learning material :

- MS Excel
- membrane software……

F. Facilities Required

1. Accommodation

- Accommodation (Lecture rooms, laboratories, etc.):
- Classroom
- Developing a laboratory where simple demonstration to show the experimental validation of theory should be developed.
-
- .....
- .....

2. Computing resources

- Laptop computer
-

3. Other resources

- .....
- .....
- .....

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Interactive learning in the class.
- Course evaluation questionnaire
- Forms are filled by all students who attend the course.....

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

Direct discussion, of the authorities concerned, with students during students' Interactive sessions/meetings.

3 Processes for Improvement of Teaching :

- Discussions and explanation on subject citing real life examples and problems.
- Absorbing information as concepts and illustrating applications to problems.
- Solving problems through assignments on each topic.
- Providing notes on lectures delivered.

Reviving a thinking process while delivering lectures in the class room.

4. Processes for Verifying Standards of Student Achievement

- Review of the course delivered after the Final examinations.
- Review of course file in coordination with the Quality Centre (QC) nominee.
- Adopting suggestions of the QC for further improvement.
- Samples of students' assignments and exams are collected every semester and reviewed with faculty member

5 Describe the planning arrangements for periodically reviewing course

effectiveness and planning for improvement :

- Analysis of presence and regularity of students in class.
- Analysis of students' performance in all the examinations.
- Analysis of all examination score.
- Analysis of degree of interaction of students in class.
- Direct discussion with student during individual student consultations at office.
- Review of course-file at mid of semester.
- Review of course-report at the beginning of following semester.
- Analysis of student feedback at end of semester.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Iskander.	***Name :***	Dr. Saleh Al Dahash
Signature :	.....	***Signature :***	.....
Date :	01/ 03 / 1437 *H*	***Date :***	…./ … / …… *H*

Institution:	*Majmaah University*.
Academic Department :	*Mechanical and Industrial Engineering*.
Programme :	*Bachelor in Mechanical and Industrial Engineering*.
Course :	*Refrigeration and Air Conditioning,(ME- 355)*.
Course Coordinator :	***Dr. Waqar Ahmed Khan***.
Programme Coordinator :	**Dr. Saleh Al Dahash**

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	*Applied Heat Transfer* — Course Code: *ME- 468*
2. Credit hours :	*3 (2,1,2)*
3 - Program(s) in which the course is offered:	*Mechanical and Industrial Engineering*
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	***Dr. Waqar Ahmed Khan.***
6 - Level/year at which this course is offered :	*Third Year, F.S, / Level 8,2015-16*

7 - Pre-requisites for this course (if any) :

- *Heat Transfer*

8 - Co-requisites for this course (if any) :

- *ME-354*

9 - Location if not on main campus **:**

(College of Engineering, Majmaah, University, Majmaah, KSA)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	√	What percentage?	10%
D - e-learning	√	What percentage?	10 %
E - Correspondence	×	What percentage?	0 %
F - Other	×	What percentage?	0%

Comments :NO comments on it

B Objectives

What is the main purpose for this course? This course aims to achieve the following objectives

1. Understand unsteady state conduction and to apply Fourier equation
2. To know the working principle of heat exchangers.
3. To know the Filmwise and dropwise condensation
4. To determine heat transfer from surfaces with uniform cross-sections.

Briefly describe any plans for developing and improving the course that are being implemented :

Better utilization of Heat Transfer laboratory so that students can experience the practical application of the

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Unsteady state conduction, Fourier equation, lumped-capacity method, Fourier and Biot number, Use of Heisler charts for plane walls, cylinders and spheres	3	9
Introduction of numerical methods to solve problems in steady and unsteady conduction, Schmidt plots.	2	6
Heat transfer from surfaces with uniform cross-sections, Solutions based on various boundary conditions, Fin efficiency curves, Applications and design	3	9
Classification of heat exchangers, Constructional details of shell-and-tube type heat exchangers, Fin-tube exchangers, Plate type exchangers, Thermal analysis, Overall heat transfer coefficient, Fouling, Effectiveness-NTU relationship, Introduction to mechanical design.	4	12
Filmwise and dropwise condensation, Derivation of heat transfer coefficient over vertical plates, Formulation for horizontal tubes and tube banks, Correction to simple theory, Pool and flow boiling, Various regimes encountered in pool boiling, Critical heat flux, Boiling inside vertical and horizontal tubes.	3	9

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	-	Nil	Nil	45
Credit	2	***1***	**-**	Nil	Nil	3

3. Additional private study/learning hours expected for students per week.

3*hrs*

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge (a, e ,k)**		
1.1	*An ability to apply principles of engineering, mathematics, and science in application of Engineering & Technology.*	*Lectures, tutorials and independent study assignments.*	*Home assignments of 10 points and Quizzes.Exam-1*
1.2	*Ability to model and solve engineering problems.*	*Animations of fundamentals of R.A.C and problems on it* *Power point presentation on different topic related to this subject*	*Examining the progress through Exam 1 and Exam 2, each of 15 points, Final exam*
1.3	*Ability to use engineering skills, tools and techniques necessary for engineering practices.*	*Individual assignments require use of library reference material and web sites to identify information required to complete tasks*S, Experiments	*Final assessment of the knowledge through final end term examination and lab reports of 15 points*
2.0	**Cognitive Skills**		
2.1	*Ability to think critically and analytically*	*Regularity during lecture classes is essential.*	*Class participation*
2.2	*Ability to develop tests in the areas covered at different levels.*	*Revising class instructions to keep up to date on the subject is key to learning*	*Peer/group response*
2.3	*Ability to produce test items in areas studied.*	*Time Management*	*Lab reports*

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		is always important to be free from burden of the subject	
2.4	*Time Management is always important to be free from burden of the subject.*	*Joint study sessions amongst students reduce doubts, promotes learning Solving the home assignments and worksheets is needed for practice*	*In-term and final.*
3.0	**Interpersonal Skills & Responsibility**		
3.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion and Evaluation*
3.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour Conducting group experiments and writing group reports, Work in groups for solving certain problems Assessing communicative Skills*	*Conducting group experiments and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.0	**Communication, Information Technology, Numerical**		
4.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion And Evaluation.*
4.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour*	*Conducting group experiments and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.3	*Use of web internet and Use of PowerPoint and laptop – projector systems*	*Writing Project/Lab reports*	*Discussion, Questioning during topics*
4.4	*Use of the advanced features in scientific calculators.*	*Incorporating the use and utilization of computer in the course requirements*	*Highlighting the concepts and principles through real life problems*

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		electronic copy of the lectures was distributed	
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	*First Major Exam*	*After 6th Week*	15
2	*Second Major Exam*	*After 12th Week*	15
3	*Final Exam*	*After 15th Week*	40
4	*Quizzes*	*Week 5,11*	7.5
5	*Homework assignments*	*Week 4, 6,12*	7.5
6	*Lab assignments*	*After 12th Week*	15

D. Student Academic Counseling and Support

• *SUNDAY*	• *10.00 A.M. TO 12.00 NOON*
• *MONDAY*	• *10.00 A.M. TO 12.00 NOON*
• *WEDNESDAY*	• *12.00 NOON TO 2.00 P.M.*

E. Learning Resources

1. List Required Textbooks :

- Heat Transfer: A Practical Approach, Yunus A. Cengel , Mc Graw Hill Book Company
- . Principles of Heat Transfer, F. Krieth and W.Z. Black, Harper and Row

2. List Essential References Materials :

- *NA*

3. List Recommended Textbooks and Reference Material :

- *As mentioned above*

4. List Electronic Materials :

- *Com Sol (Heat transfer, fluid flow, Acoustics, R.A.C…)*
- *WinTherm heat transfer software*

5. Other learning material :

- *Com Sol (Heat transfer, fluid flow, Acoustics, R.A.C…)*
- *Thermo fluid software springer (Thermo fluid)*
- *WinTherm heat transfer software*

F. Facilities Required

1. Accommodation

- *Lecture Rooms*
- *Modern Heat Transfer lab*

2. Computing resources

- *Proper projector system*

59. Other resources.

Nil

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- *Direct interaction with different groups of students.*
- *As per routine being practiced in the college.*
- *Course evaluation forms filled by students attending the course.*

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- *NA*

3 Processes for Improvement of Teaching :

- *Training for solving more exercise sessions.*
- *Workshops to facilitate the exchange of experiences amongst faculty members.*
- *Regular meetings where problems are discussed and solutions given.*
- *Attending professional development conferences.*
- *Industrial Interaction on trends*

4. Processes for Verifying Standards of Student Achievement

- *Samples of students' assignments and exams are collected every semester and reviewed with faculty members.*
- *Examine students by basic concept questions on subject after completion of semester.*
- *Result of students also reflects the standard of knowledge.*
- *Group discussions on various subject topics should be conducted and assessed by the senior faculty member*

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- *Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.*

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Waqar Ahamad Khan	***Name :***	Dr. Saleh Al Dahash
Signature :	.....	***Signature :***	.....
Date :	25/ 03 / 1437-38 *H*	***Date :***	25/ 03 / 1437-38 *H*

Institution:	*Majmaah University*.
Academic Department :	*Mechanical and Industrial Engineering*.
Programme :	*Bachelor in Mechanical and Industrial Engineering*.
Course :	*Refrigeration and Air Conditioning,(ME- 355)*.
Course Coordinator :	***Dr. Vakkar Ali***.
Programme Coordinator :	**Dr. Saleh Al Dahash**

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Refrigeration and Air Conditioning — Course Code: ME- 355
2. Credit hours :	3 (2,1,2)
3 - Program(s) in which the course is offered:	Mechanical and Industrial Engineering
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	Dr. Vakkar Ali.
6 - Level/year at which this course is offered :	Third Year, F.S, / Level 8,2015-16

7 - Pre-requisites for this course (if any) :

- Nil

8 - Co-requisites for this course (if any) :

- ME-354

9 - Location if not on main campus :

(College of Engineering, Majmaah, University, Majmaah, KSA)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	√	What percentage?	10%
D - e-learning	√	What percentage?	10 %
E - Correspondence	×	What percentage?	0 %
F - Other	×	What percentage?	0%

Comments :NO comments on it

B Objectives

What is the main purpose for this course?

1. An understanding of the definition, necessary background and importance of the subject of R.A.C.
2. Use the techniques, skills, and modern engineering tools necessary for engineering practice.
3. Students are able to design the R.A.C equipment's and able to work on the systems related to this course.

Briefly describe any plans for developing and improving the course that are being implemented :

Better utilization of R.A.C laboratory so that students can experience the practical application of the theory of R.A.C

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Review of basic thermodynamics.	1	3
Vapor compression cycles.	2	6
Main components: compressor, condenser, evaporator, expansion valves.	2	6
Multi-stage and cascade vapor compression refrigeration	1	3
Refrigerants and their characteristics.	1	3
Introduction to absorption refrigeration.	2	5
Psychometry and psychometric processes.	2	6
Human comfort.	2	6
Cooling load calculations aspects.	2	6

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	14	31	Nil	Nil	75
Credit	2	***1***	***2***	Nil	Nil	3

3. Additional private study/learning hours expected for students per week.

3hrs

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge (a, e ,k)**		
1.1	*An ability to apply principles of engineering, mathematics, and science in application of Engineering & Technology.*	*Lectures, tutorials and independent study assignments.*	*Home assignments of 10 points and Quizzes.Exam-1*
1.2	*Ability to model engineering problems.*	*Animations of fundamentals of R.A.C and problems on it* *Power point presentation on different topic related to this subject*	*Examining the progress through Exam 1 and Exam 2, each of 15 points, Final exam*
1.3	*An ability to use engineering skills, tools and techniques necessary for engineering practices.*	*Individual assignments require use of library reference material and web sites to identify information required to complete tasks*S, Experiments	*Final assessment of the knowledge through final end term examination and lab reports of 15 points*
2.0	**Cognitive Skills**		
2.1	*Ability to think critically and analytically*	*Regularity during lecture classes is essential.*	*Class participation*
2.2	*Ability to develop tests in the areas covered at different levels.*	*Revising class instructions to keep up to date on the subject is key to learning*	*Peer/group response*
2.3	*Ability to produce test items in areas studied.*	*Time Management is always important to be free from burden of the subject*	*Lab reports*
2.4	*Time Management is always important to be free from burden of the subject.*	*Joint study sessions amongst students reduce doubts, promotes*	*In-term and final.*

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
		learning Solving the home assignments and worksheets is needed for practice	
3.0	**Interpersonal Skills & Responsibility**		
3.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion and Evaluation*
3.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour Conducting group experiments and writing group reports, Work in groups for solving certain problems Assessing communicative Skills*	*Conducting group experiments and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.0	**Communication, Information Technology, Numerical**		
4.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion And Evaluation.*
4.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour*	*Conducting group experiments and writing group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.3	*Use of web internet and Use of PowerPoint and laptop – projector systems*	*Writing Project/Lab reports*	*Discussion, Questioning during topics*
4.4	*Use of the advanced features in scientific calculators.*	*Incorporating the use and utilization of computer in the course requirements electronic copy of the lectures was distributed*	*Highlighting the concepts and principles through real life problems*
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	*First Major Exam*	*After 6th Week*	15
2	*Second Major Exam*	*After 12th Week*	15
3	*Final Exam*	*After 15th Week*	40
4	*Quizzes*	*Week 5,11*	7.5
5	*Homework assignments*	*Week 4, 6,12*	7.5
6	*Lab assignments*	*After 12th Week*	15

D. Student Academic Counseling and Support

• *SUNDAY*	• *10.00 A.M. TO 12.00 NOON*
• *MONDAY*	• *10.00 A.M. TO 12.00 NOON*
• *WEDNESDAY*	• *12.00 NOON TO 2.00 P.M.*

E. Learning Resources

1. List Required Textbooks :

- *1. Refrigeration and air conditioning by W. Stoecker and J. Jones.*
- *2. Refrigeration and air condtining by Balaney*

2. List Essential References Materials :

- *NA*

3. List Recommended Textbooks and Reference Material :

- *As mentioned above*

4. List Electronic Materials :

- *Com Sol (Heat transfer, fluid flow, Acoustics, R.A.C…)*
- *WinTherm heat transfer software*

5. Other learning material :

- *Com Sol (Heat transfer, fluid flow, Acoustics, R.A.C…)*

- *Thermo fluid software springer (Thermo fluid)*
- *WinTherm heat transfer software*

F. Facilities Required

1. Accommodation

- *Lecture Rooms*
- *Modern R.A.C lab*

2. Computing resources

- *Proper projector system*

63. Other resources.

- *Complete Refrigeration test rig has to be setup for better understanding and technical skill.*
- *Kits of condenser, evaporator, expansion valve, etc.*

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- *Direct interaction with different group of students.*
- *As per routine being practiced in the college.*
- *Course evaluation forms filled by students attending the course.*

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- *NA*

3 Processes for Improvement of Teaching :

- *Training for solving more exercise sessions.*
- *Workshops to facilitate the exchange of experiences amongst faculty members.*
- *Regular meetings where problems are discussed and solutions given.*
- *Attending professional development conferences.*
- *Industrial Interaction on trends*

4. Processes for Verifying Standards of Student Achievement

- *Samples of students' assignments and exams are collected every semester and reviewed with faculty members.*
- *Examine students by basic concept questions on subject after completion of semester.*
- *Result of students also reflects the standard of knowledge.*
- *Group discussions on various subject topics should be conducted and assessed by the senior faculty member*

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- *Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.*

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr. Vakkar Ali	***Name :***	**Dr. Saleh Al Dahash**
Signature :	.....	***Signature :***	.....
Date :	25/ 03 / 1437-38 *H*	***Date :***	25/ 03 / 1437-38 *H*

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Engineering Economy — Course Code: GE 407
2. Credit hours :	**02** (2-1-0)
3 - Program(s) in which the course is offered:	**Mechanical & industrial Engineering, Electrical, and Civil Engineering**
4 – Course Language :	**English**.
5 - Name of faculty member responsible for the course:	Dr Chandra Hakim.
6 - Level/year at which this course is offered :	**09**

7 - Pre-requisites for this course (if any) :

- **None**

8 - Co-requisites for this course (if any) :

- **None**

9 - Location if not on main campus **:**

Main campus

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	**80 %**
B - Blended (traditional and online)	√	What percentage?	**10 %**
D - e-learning	√	What percentage?	**10 %**
E - Correspondence		What percentage?	**……. %**
F - Other		What percentage?	**……. %**

Comments :

……

B Objectives

What is the main purpose for this course?

Prepare Engineering students to analyze cost /revenue data and to carry out an economic analysis leading to decision making process either to accept or reject the given alternatives on economic basis..

Briefly describe any plans for developing and improving the course that are being implemented :

Modelling NPV, IRR, replacement problems and calculating economic equivalence using MS excel build-in functions. Discussion is made on MS excel

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to engineering economic decision, time value of money, cash flow diagram	2	6
Interest rate, economic equivalence	3	9
Present worth analysis	2	6
Annual cash flow analysis	1	3
Rate of return analysis	1	3
Project uncertainty	2	6
Replacement decision and benefit-cost analysis	2	6
Inflation and price change	1	3
Cost accounting	1	3

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15				45
Credit	02					

3. Additional private study/learning hours expected for students per week.

02

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Learning of economic equivalence	Emphasis on hand on practice based learning	Conducting quizzes, home work
1.2	Cost benefit analysis	Examples of real life problems are discussed to create interest	Term exams and final exams
1.3	Project uncertainties, accounting and inflation	Interactive teaching learning and exercises	Performance in exercises
1.4	**.....**	.....	.....
2.0	**Cognitive Skills**		
2.1	Recognizing the applicability of economic principles in the field of engineering	Solving real life economic problems	Examinations
2.2	Solving complex economic problem	Involving students to solve descriptive problems during exercise sessions	Assignments, Final, and term exams
2.3	**.....**	.....	.....
3.0	**Interpersonal Skills & Responsibility**		
3.1	Participating in group discussions	Interactive teaching learning session	Performance in discussions
3.2			
3.3	**.....**	.....	.....
4.0	**Communication, Information Technology, Numerical**		
4.1	Application of IT tools in solving the economic problem	Use of MS Excel built function	The correctness of formulation, codes and functions used in MS excel spread sheet
4.2			
4.3	**.....**	.....	.....
4.4	**.....**	.....	.....

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.5	.....	.....	.....
4.6	.....	.....	.....
5.0	**Psychomotor**		
5.1	.....	.....	.....
5.2	.....	.....	.....
5.3	.....	.....	.....
5.4	.....	.....	.....
5.5	.....	.....	.....
5.6	.....	.....	.....

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	8th	20
2	Second Major Exam	12th	20
3	Final Exam	15th	40
4	Quiz	7th and 11th week	10
5	Homework and assignments	9th an 13th week	10
6	.....	.....	.....

D. Student Academic Counseling and Support

a-	Weekly office hours	1hrs
b-	Meetings and discussions on Blackboard/D2L	1hr

E. Learning Resources

1. List Required Textbooks :

- Leland Blank, P.E., and Anthony Tarquin, P.E., "Engineering Economy", McGraw-Hill, 6 Ed., 2005
- Sullivan, W. G., Bontadelli, J. A. and Wicks, E. M., "Engineering Economy", 11th ed., Prentice Hall, Upper Saddle River, New Jersey, 2001

2. List Essential References Materials :

- Leland Blank, P.E., and Anthony Tarquin, P.E., "Engineering Economy", McGraw-Hill, 6 Ed., 2005.
- .....

3. List Recommended Textbooks and Reference Material :

- Leland Blank, P.E., and Anthony Tarquin, P.E., "Engineering Economy", McGraw-Hill, 6 Ed., 2005
- .....

4. List Electronic Materials :

- MIT open course ware http://ocw.mit.edu/courses/engineering-systems-division/esd-70j-engineering-economy-module-fall-2009/download-course-materials/
- Material and solution is uploaded on D2l
- .....

5. Other learning material :

- http://nptel.ac.in/downloads/105103023/

F. Facilities Required

1. Accommodation

- **Classroom**

- **Computer laboratory**

2. Computing resources

- **Projector**

3. Other resources

NO

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Course Evaluation Survey filled by students

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- Faculty Peer Assessment
- .....

3 Processes for Improvement of Teaching :

- Plan: The instructor will develop a strategy for teaching.
- Do: The strategy will be implemented for one semester.
- Study: The experiences of the students will be collected through a survey.
- Act: Effective teaching strategies will be implemented and revised as more experiences are gained.

4. Processes for Verifying Standards of Student Achievement

- Samples of student works will be reviewed by another instructor assigned by the department
- .....

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- The course reports shall be reviewed every semester years by the Course Report Committee and the recommendations will be passed to the instructor department council for review and possible adaptation..

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr Chandra Hakim.	***Name :***	Dr Saleh Aldahash
Signature :	.....	***Signature :***	.....
Date :	24/03 / 1437 *H*	***Date :***	24/03 / 1437 *H*

Institution:	Majmaah University.
Academic Department :	Dept. Mechanical & Industrial engineering.
Programme :	Mechanical & Industrial engineering.
Course :	Internal Combustion Engines ME 459
Course Coordinator :	Iskander.
Programme Coordinator :	**Dr. Saleh Al Dahash**

Course Specification Approved Date :	25/01/1437 H

A. Course Identification and General Information

1 - Course title :	Internal Combustion Engines. Course Code: ME 459
2. Credit hours :	3 (3,1,0)
3 - Program(s) in which the course is offered:	Bachelor degree: Mechanical & Industrial engineering Program.
4 – Course Language :	Eng.
5 - Name of faculty member responsible for the course:	Iskander.
6 - Level/year at which this course is offered :	Final year / Level 9

7 - Pre-requisites for this course (if any) :

- ME 252

8 - Co-requisites for this course (if any) :

- None

9 - Location if not on main campus :

(.....)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	95 %
B - Blended (traditional and online)		What percentage?	..... %
D - e-learning	√	What percentage?	3 %
E - Correspondence	√	What percentage?	2 %
F - Other		What percentage?	..... %

Comments :

.....

B Objectives

What is the main purpose for this course?

ix. To introduce the basic concepts, definitions and importance of the IC Engines.
x. Develop an ability to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories.
xi. To be able to understand choice of engines for different applications
xii. Should be able to analyse engine operation based on its working cycles.
xiii. Should be able to understand design and operating parameters of engines and combustion chamber.
xiv. Should be able to appreciate thermo chemistry of fuel-air mixture, and working of carburettors and electronic fuel injection systems.
xv. Be able to understand the importance and use performance parameters.

Briefly describe any plans for developing and improving the course that are being implemented :

.....

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to IC Engines; Defining important terms and parameters.	2-3	6
Design features and operating characteristics of different types of internal combustion engines: spark-ignition, diesel.	4-5	6
Combustion chamber design, and octane number.	6-7	6
Performance parameters. The fundamentals of how the design and operation of internal combustion engines affect their performance, operation, fuel requirements.	8-9	6
Gas exchange processes and volumetric efficiency	10-11	6
Carburetors and electronic fuel injection, Diesel fuel injection	12-13	6
Thermo chemistry of fuel-air mixture and thermodynamic models of working fluids and engine cycles.	14-15	6
Supercharging of 4-stroke and 2-stroke S.I. and C.I. engines.	.....	.....
.....	.....	.....

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	**15**	0	0		**60**
Credit	**3**	1	0	0		**3**

3. Additional private study/learning hours expected for students per week.

.. Minimum 2 to 3 Hours per week for the subject is sufficient for the students..

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.1	All fields of engineering are basically full of machines and devices which are always in action and involve interrelated motions. We intend that the students may achieve a basic level of understanding of the operation of various engines and may be able to deal with study of various engine systems as well. The students, at the end of the course, should be able to use this subject information for future research & development in higher studies. In fact, knowledge of engine operation and combustion is a must as it is the most important part of every engine design problem. Hence, the subject also deals with the physics involved in engine design.	-Experience has shown that this subject has always been a source of attraction and motivation to the students. Following strategies or steps are planned to motivate students towards self-learning process as well: -Further motivating students by slowly starting with simple explanations and simple problems and then moving towards complex areas of the subject. -Discussing common day to day applications of the subject. (Demonstrated practically if possible with few of the topics.) -Initially asking the students simple questions on the subject and then highly appreciating their understanding aptitude.	Mid Term I : 20 Point Mid Term II : 20 Point Final Term : 40 Point Home assignments & Quiz 20 Points Total 100 Points
2.0			

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.1	The basic mental skills to be targeted include Relaxation and self-talk, Mental rehearsal, Concentration, Goal-setting.	**Removing Subject Paranoia:** The subject paranoia need to be removed from the minds of students by first dealing with common events in our daily life related to the subject. This leads to a relaxed mind ready and receptive to information. **Converting Information to a Conceptual Belief:** Any information received is just useless until it becomes a belief. Our brain receives an information, frames it and subsequently our mind analyses it. Process of analysis is a must as it rehearses the printed image of information again and again to match it with similar problem statements. Similarly, otherwise, if a new problem statement is posed the mind takes the previous information from the brain, scans it and analyses it for a solution. **Authenticity of the Source Of Information & Clarity in the Method Of Transfer Of Information:** For concentration of the brain on any subject we need a source of information which is reliable and also it is very important that the method of transfer of information is crystal clear. If the pasted information on the brain is blur the mind cannot do a correct analysis rather the concentration is lost in the subject. Seeing is believing: demonstrating simple experiments make the imagination more strong and this stamps a clear picture on the brain which reflects back again and again whenever it comes across similar problem statement. This trains the mind to use the information pasted on the brain and activate the inherent mental abilities with in every learner. **Concepts Motivate for Action to achieve Goals:** When information takes shape of a belief it becomes a concept. A conceptual mind is always active, instructive and originates motivation. Motivation leads to a thought process and the targets and goals are set for action.	This is an important task. Assessment can be done using non-conventional and convention methods, both. Non-Conventional techniques require very close associative bond with each student. Every student has his own ingenuity where his creativity can be shaped. All techniques to assess should be optional and student can opt for any one activity. This brings out his decision making capability where he judges his comfort zone to participate and use his inherent mental abilities. -Promoting and shaping projects originating from students' mind. -Organizing students' seminars where the topics already taught can be used by the students to deliver a lecture. -Planning surveys of various types to gather subject information in an organized statistical form and giving self-analysis based on the data collected. -Deputing students on each individual test/experimental setup for its running and up keep. -Developing simple demonstration equipment to show simple concepts of the subject and also for use in the laboratory or elsewhere. -Article writing or even book writing can be one of the areas to explore. -Starting students' chapters of various International societies for students to run the activities of the society. In fact, I personally used all these techniques regularly on 30 to 40 % of my students in class at mid-level of their under graduate course. The results were extra ordinary as this

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
			helped me to develop my own self too along with the students.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.0	**Interpersonal Skills & Responsibility**		
3.1	• Students can complete all assignments in due time • Students can participate in class discussion and think critically • Students can act responsibly and ethically in carrying out individual as well as group projects • Students have the necessary skills to communicate, listen, negotiate, and evaluate their strengths and weaknesses as members of a team • Students have the necessary skills to defend their points of view and/or proposed solution to any problem based on the acquired knowledge. • Students have the necessary skills to evaluate peers' answers and solutions, point and correct their mistakes	• Lectures in which students are made aware of the significance of time management • Discussions with students on ethical behaviour in conducting research • Individual counselling on research projects and subject matter difficulties. - Group assignments where much of the most effective learning comes from the student explaining, discussing and defending her own ideas with her peers. **- Break a chapter into manageable chunks**: Once the student read an entire chapter break up the text into three-four sections. Read and underline one section at a time before moving on to the next section. **- Utilize review tools in the text book**: One the student read and underlined the chapter; he should follow this by going directly to the review questions at the end of the sections. This is an important way to test his knowledge. - Students have to figure out what his learning style is, and fit his study approaches to that style. - Students are expected to develop certain teamwork activities regarding the theoretical part.	Active class participation reflects the students ability to keep up with the concealed math ideas Homework assignments will attest to the student's ability to fulfil required tasks and respect deadlines Performance on midterms and final exams are evidence of the student's ability to recollect and synthesize information. Instructor's assessment of student's performance and seriousness during individual practice hours

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.0	**Communication, Information Technology, Numerical**		
4.1	Use of Mathematical package and such Thermodynamics software. Use of web internet. Use of PowerPoint and laptop – projector systems. Use of the advanced features in scientific calculators.	Encourage students to consult the specialist in the computer lab for help on web-based material Demand the use of PowerPoint when giving presentations in projects Solving lots of problems using software. Students will be asked to deliver summary regarding certain topics related to the course. Students will be asked to prepare and present subjects using different educational strategies (power point presentation, projections…) Each student is expected to prepare and present one issue regarding to the course.	Some marks for the use of web-based material in students' presentations. Distribute some marks in every assigned project so students know what they will be evaluated on Set marks for the PowerPoint presentation students create to give their presentations, its content and their presentation skills. Set marks in doing lots of solving problems using software.
5.0	**Psychomotor**		
5.1	**.....** **.....** **.....** **...**	……	……
5.2	**.....** **.....** **.....** **...**	……	……
5.3	**.....** **.....** **.....** **...**	……	……
5.4	**.....** **.....** **.....** **...**	……	……
5.5	**.....** **.....** **.....** **...**	……	……

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	HW, CW & Quiz Test-I	3rd/4th week	05
2	Mid Term I	7th week	20
3	HW, CW & Quiz Test-II	9th/10th week	05
4	Mid Term II	13th week	20
5	HW, CW & Quiz Test-III	14th week	05
6	project evaluation	15th week	05
7	Final Term	16th week	40
8	Total	……	100%

D. Student Academic Counseling and Support

Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week):

Due support to solve the problems faced by the students while doing their self study is a must. In view of this the students are free to access the teaching staff as and when required during the free time of the concerned teacher.

To be specific and bounding following slots are allotted every week for the students to contact in the office of the concerned instructor of thermodynamics:

7. Monday: 10.00 am to 12.00am
8. Wednesday: 9.00 am to 10.00am

weekly office hours

E. Learning Resources

1. List Required Textbooks :

- Internal Combustion Engines, V. Ganesan, Tata McGraw-Hill, 2012……

2. List Essential References Materials :

- Internal Combustion Engines Fundamentals by J.B. Heywood, McGraw Hill

3. List Recommended Textbooks and Reference Material :

- ……
- ……
- ……

4. List Electronic Materials :

- ……
- ……

5. Other learning material :

- MS Excel
- IC Engine software……

F. Facilities Required

1. Accommodation

- Accommodation (Lecture rooms, laboratories, etc.):
- Classroom
- Developing a laboratory where simple demonstration to show the experimental validation of theory should be developed.
- Having at least one engine test rig is a must for practical demonstration.
- ……
- ……

2. Computing resources

- Laptop computer
- projector system

3. Other resources

- ……
- ……
- ……

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Interactive learning in the class.
- Course evaluation questionnaire
- Forms are filled by all students who attend the course…..

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

Direct discussion, of the authorities concerned, with students during students' Interactive sessions/meetings.

3 Processes for Improvement of Teaching :

- Discussions and explanation on subject citing real life examples and problems.
- Absorbing information as concepts and illustrating applications to problems.
- Solving problems through assignments on each topic.
- Providing notes on lectures delivered.

Reviving a thinking process while delivering lectures in the class room.

4. Processes for Verifying Standards of Student Achievement

- Review of the course delivered after the Final examinations.
- Review of course file in coordination with the Quality Centre (QC) nominee.
- Adopting suggestions of the QC for further improvement.
- Samples of students' assignments and exams are collected every semester and reviewed with faculty member

5 Describe the planning arrangements for periodically reviewing course

effectiveness and planning for improvement :

- Analysis of presence and regularity of students in class.
- Analysis of students' performance in all the examinations.
- Analysis of all examination score.
- Analysis of degree of interaction of students in class.
- Direct discussion with student during individual student consultations at office.
- Review of course-file at mid of semester.
- Review of course-report at the beginning of following semester.
- Analysis of student feedback at end of semester.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Iskander.	***Name :***	Dr. Saleh Al Dahash
Signature :	.....	***Signature :***	.....
Date :	01/ 03 / 1437 *H*	***Date :***	…./ … / …… *H*

Institution:	.Majmaah University, KSA
Academic Department :	Department of Mechanical engineering
Programme :	Bachelor degree in Mechanical Engineering
Course :	Power Plants (ME 460)
Course Coordinator :	.Dr. Mohammad Nadeem Khan
Programme Coordinator :	**Dr. Saleh Al Dahash**
Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title : Power Plants	Course Code: ME- 460
2. Credit hours : (3)	
3 - Program(s) in which the course is offered:	Bachelor degree in Mechanical Engineering
4 – Course Language : English	
5 - Name of faculty member responsible for the course:	Dr. Mohammad Nadeem Khan.
6 - Level/year at which this course is offered :	Level 10/First semester 2014-2015
7 - Pre-requisites for this course (if any) : • Heat Transfer (ME-354)	
8 - Co-requisites for this course (if any) : • N.A.	
9 - Location if not on main campus : (Main Building of the College)	

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	X	What percentage?	NIL %
D - e-learning	√	What percentage?	20 %
E - Correspondence	X	What percentage?	NIL %
F - Other	X	What percentage?	NIL %

Comments :

.....

B Objectives

What is the main purpose for this course?

An understanding of the definition, necessary backgournd and importance of the subject of Power Plants, in addition to the abilty to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to:

- ✓ Understand different power generation systems, and steam and gas power cycles.
- ✓ Understand basic and auxiliary systems of steam power plant,
- ✓ Be able to analyze the performance of the different parts of the power plant as well as the overall performance of the plant, and recognize the economics of power plants.

Briefly describe any plans for developing and improving the course that are being implemented :

There should be at least one official visit to any power plant to make this subject more practical.

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Energy demand and power generation systems	1	3
Steam and gas power cycles	3	9
Fuels and combustion.		
Basic and auxiliary systems of a steam p.p.	2	6
Steam generator analysis.	1	3
Steam turbines and their controls.	1	3
Gas turbine power plants	3	9
Diesel engine power plants	2	6
Overall plant performance	1	3
Economic of power plant	1	3

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15	NIL	NIL	NIL	60
Credit	03	NIL	NIL	NIL	NIL	03

3. Additional private study/learning hours expected for students per week.

NIL

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	This course deals with application of thermal engineering and heat transfer to different systems. It is concerned with the types, construction, working principles and performance of: boilers, heat exchangers, turbines, power plants, internal combustion engines, overall plant performance, load curves and economics of power plants.	This course is supported by tutorials and exams.	Three exams and one quizzes, homework assignments.
2.0	**Cognitive Skills**		
2.1	➢ Students able to define basic terms and properties used in thermodynamics and state first, second law of thermodynamics and apply it to different thermodynamics systems ➢ Students able to represent different types of steam cycles on pressure-volume and temperature diagram	➢ Lectures are followed by numerous examples for simple cycles ➢ Tutorials are used to explain further the practical cases ➢ Engage students in giving presentations on different topics related to subject.	Homework assignments, exams, and quizs.
3.0	**Interpersonal Skills & Responsibility**		
3.1	➢ Punctual attendance of classes and tutorials ➢ Student will take the responsibility to solve given assignments on their own and submit the solution on time. ➢ Students learn to manage their time in self-study of the course engineering technology.	➢ Assignment is given to the students at regular intervals for them to solve and submit. 10% of the final grade is allocated to the assignments. Late or no submission of assignments carries penalties or loss of grade points. ➢ Participation of students in classroom discussion.	➢ Class attendance of students at the beginning of the lecture is recoded. ➢ Recording of submission of assignment and the grades.
4.0	**Communication, Information Technology, Numerical**		
4.1	Ability of the students to apply basic practice in industry or power plant.	Questions of tests and assignments require students' knowledge in the course materials	Through the students' aggregate score in all tests and assignments.
5.0	**Psychomotor**		
5.1	Not Applicable	Not Applicable	Not Applicable

5. Schedule of Assessment Tasks for Students during the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	6th week	20%
2	Second Major Exam	13th week	20%
3	Final Exam	Final exam week	40%
4	Assignments	Total four	20%

D. Student Academic Counseling and Support

- ✓ Weekly office hours
- ✓ Meetings and discussions on Blackboard/D2L

E. Learning Resources

1. List Required Textbooks :
Power Plant Engineering, P.K.Nag, McGraw Hill

2. List Essential References Materials :
NIL

3. List Recommended Textbooks and Reference Material :
Power plant Technology, by M.M. EL-Wakil, McGraw Hill

4. List Electronic Materials :
NIL

5. Other learning material :
NIL

F. Facilities Required

1. Accommodation
- e- Classroom
- f- Laptop/ board/ broad marker

2. Computing resources
- c- Laptop
- d- projector system

3. Other resources
NA

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:
Course Evaluation Survey filled by students

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :
Faculty Peer Assessment

3 Processes for Improvement of Teaching :

4. Processes for Verifying Standards of Student Achievement
Samples of student works will be reviewed by another instructor assigned by the department.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :
The Improvement Loop details the steps of course and program improvement. The course reports will be reviewed every two years by the Course Report Committee and the recommendations will be passed to the department council for review and possible adaptation.

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	.....	***Name :***	Dr. Saleh Al Dahash
Signature :	.....	***Signature :***	.....
Date :	…./ … / …… *H*	***Date :***	…./ … / …… *H*

Institution:	Majmaah University
Academic Department :	Mechanical and Industrial Engineering
Programme :	Mechanical Engineering
Course :	CAD/CAM (ME-415), Section No. 482
Course Coordinator :	Dr. Waseem Sabir Khan

Programme Coordinator :	**Dr. Saleh Al Dahash**
Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	Comp. Aided Manuf. — Course Code: **ME-415**
2. Credit hours :	(2, 1, 2), 3 Credit hours
3 - Program(s) in which the course is offered:	**Mechanical Engineering**
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	**Dr. Waseem S Khan**
6 - Level/year at which this course is offered :	**4th Year**

7 - Pre-requisites for this course (if any) : Manufacturing Processes

- .....

8 - Co-requisites for this course (if any) :

- .....

9 - Location if not on main campus : **Engineering Building**

(.....)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	*	What percentage?	**60 %**
B - Blended (traditional and online)		What percentage?	**..... %**
D - e-learning		What percentage?	**..... %**
E - Correspondence		What percentage?	**..... %**
F - Other	*	What percentage?	**40 %**

Comments: F stands for Laboratory Experiments.

.....

B Objectives

What is the main purpose for this course?

Students should know Automation, Different Types CNC m/c their programing, Robots, Numerical control production: NC part programming. DNC, CNC, and adaptive control, Production economics. Cost in manufacturing, factory overheads, capital investment, present worth method, High volume production systems, cost of equipments usage.

Briefly describe any plans for developing and improving the course that are being implemented :

Performing experimental work on CNC lathes, Use of software like PRO-E will enhance their product

designing and development skills

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to CNC, Manufacturing Processes, Types of CNC Machines	3	9
Automation strategies. Automation Strategies, production concepts and, types of production, types of automation,	2	6
CNC Programming Exercise	2	6
Production Operation and Automation Strategies	2	6
Production Function & Cost Function	1	3
Introduction to Robotics	1	3
Production Systems, Automation in Production Systems, Manual Labor in Production Systems, Automation Principles and Strategies	2	6
Quality control and automated inspection. Control systems	1	3
Programmable controllers. Computer networks.	1	3

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	30	.....	.....	**75**
Credit	2	1	2	.....	.....	**3**

3. Additional private study/learning hours expected for students per week.

1 hr. for helping students in office

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Conventional Manufacturing Process and Machining on CNC	Power Point Presentation with 3D modeling and simulations	Assignments, Exams, Quiz and Group discussions
1.2	CNC Programming Exercise	Power Point Presentation and using CNC in Lab.	Exercise in lab. and class, Exam and Lab. report
1.3	Automation strategies. Automation Strategies, production concepts and, types of production, types of automation in industries	Power Point Presentation, solving E.g. problems on blackboard	Assignments, Exams, Quiz and Group discussions
1.4	Production Function & Cost Function	Power Point Presentation, solving E.g. problems on blackboard	Assignments, Exams, Quiz and Group discussions
1.5	.....	.....	.....
1.6	.....	.....	.....
2.0	**Cognitive Skills**		
2.1	Revision and recapitulating in the beginning of class and asking students to recall the contents of previous class	Power Point Presentation, solving E.g. problems on blackboard	Assignments, Exams, Quiz and Group discussions.
2.2	Involving the students to solve problems	Group discussions	Assignments, Exams and Quiz
2.3	.....	.....	.....
2.4	.....	.....	.....
2.5	.....	.....	.....
2.6	.....	.....	.....
3.0	**Interpersonal Skills & Responsibility**		
3.1	Motivating through participating in groups discussions	Asking definitions, rules and applications etc. discussions and sharing	Assignments, Exams, Quiz and Group discussions.
3.2	Assignment on CNC Lathe programming and CNC Milling Programming	Using blackboard to write program and run the CNC machine in the Lab.	Lab. Report

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.3	.....	.....	.....
3.4	.....	.....	.....
3.5	.....	.....	.....
3.6	.....	.....	.....
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicating with use of technical words related to the courses contents and ability to present with the aid of power point presentations	Showing some models through power point presentations and asking them to apply rules and terminologies	Assignment
4.2	.....	.....	.....
4.3	.....	.....	.....
4.4	.....	.....	.....
4.5	.....	.....	.....
4.6	.....	.....	.....
5.0	**Psychomotor**		
5.1	+ …00……	.....	.....
5.2		.....	.....
5.3	.....	.....	.....
5.4	.....	.....	.....
5.5	.....	.....	.....
5.6	.....	.....	.....

5. Schedule of Assessment Tasks for Students during the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Reviews of Conventional Manufacturing Processes	1-3	100%
2	Introduction to CAD/CAM, Basics and Fundamentals	4-5	100%
3	CNC programming Exercises	6-9	100%
4	Automation and types of Automation	10-11	100%
5	Production Systems, Automation in Production Systems, Manual Labor in Production Systems, Automation Principles and Strategies	12-14	100%

6	Production Function & Cost Function	16-15	100%
7	**…….**	……	……
8	**…….**	……	……

D. Student Academic Counseling and Support

.....

E. Learning Resources

1. List Required Textbooks :

- Computer Numerical Control Programming Basics by Steve Krar Arthur Gill
- Automation, Production Systems and Computer-Integrated Manufacturing by Mikell P. Groover
- Introduction to CNC by James Valentino, 3rd edition, 2003.

2. List Essential References Materials :

- Introduction to CNC by James Valentino, 3rd edition, 2003.
-
-
- .....
- .....

3. List Recommended Textbooks and Reference Material :

- Computer Numerical Control Programming Basics by Steve Krar Arthur Gill
- Automation, Production Systems and Computer-Integrated Manufacturing by Mikell P. Groover
- Computer-Aided Manufacturing; Tien-Chien Chang, Richard A. Wysk, and Hsu-Pin Wang, 2nd Ed. (1998), Prentice Hall. (ISBN 0-13-754524-X)
-

- .....
- .....
- .....

4. List Electronic Materials :

ONLINE HELP FOR PROGRAMMING ON CNC

- .....
- .....

5. Other learning material :

- .....
- .....
- .....

F. Facilities Required

1. Accommodation • …… • ……
2. Computing resources • **Pro-Engineer software.** • …… • ……
3. Other resources • …… • …… • ……

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: • Students fill-up teaching evaluation form at the end of semester in order to determine teaching effectiveness and course evaluation. • …… • ……
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor : • **Department Meetings under Departmental head.** • …… • ……
3 Processes for Improvement of Teaching : • **Matching our syllabus with foreign universities.** • **Matching our teaching with foreign Universities.** • …… • ……
4. Processes for Verifying Standards of Student Achievement • Matching our standards with other universities in Saudia and abroad. • …… • ……
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement : • **Course evaluation in each semester and course effectiveness in departmental meetings.** • …… • ……

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Dr. Waseem Sabir Khan	***Name :***	**Dr. Saleh Al Dahash**
Signature :	W.S. Khan	***Signature :***	.....
Date :	…25./ …03 / …1437… *H*	***Date :***	…./ … / …… *H*

Institution:	*Majmaah University.*
Academic Department :	*Mechanical and Industrial Engineering.*
Programme :	*Bachelor in Mechanical and Industrial Engineering.*
Course :	*Energy Conversion(ME-465)*
Course Coordinator :	***Dr. Vakkar Ali***
Programme Coordinator :	**Dr. Saleh Al Dahash**

Course Specification Approved Date :	25/01/1436 H

A. Course Identification and General Information

1 - Course title :	*Energy Convesion* — Course Code: *ME- 465*
2. Credit hours :	*3 (3,1,0)*
3 - Program(s) in which the course is offered:	*Mechanical and Industrial Engineering*
4 – Course Language :	English
5 - Name of faculty member responsible for the course:	***Dr. Vakkar Ali.***
6 - Level/year at which this course is offered :	*Final year F.S. ,Level 10,2015-16*

7 - Pre-requisites for this course (if any) :

- *ME-354*

8 - Co-requisites for this course (if any) :

- *Nil*

9 - Location if not on main campus **:**

(College of Engineering, Majmaah, University, Majmaah, KSA)

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	80 %
B - Blended (traditional and online)	√	What percentage?	10%
D - e-learning	√	What percentage?	10 %
E - Correspondence	×	What percentage?	0 %
F - Other	×	What percentage?	0%

Comments :NO comments on it

B Objectives

What is the main purpose for this course?

1. An understanding of the definition, necessary background and importance of the subject of Energy conversion.
2. Use the techniques, skills, and modern engineering tools necessary for engineering practice.
3. Students are able to understand energy conversion devices and able to work on the systems related to this course.

Briefly describe any plans for developing and improving the course that are being implemented :

Better utilization of Energy conversion laboratory so that students can experience the practical application of the Energy conversion systems

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Review of (Internal combustion engine, Gas turbine, Steam power plants)	2	6
Thermoelectric generators	2	6
Thermoelectric Refrigerator	1	3
Thermionic generator	1	3
Magneto hydrodynamic generators	2	6
Fuel cells	2	6
Photovoltaic generators.	2	6
Energy storage, Other energy conversion systems.	*3*	9

2. Course components (total contact hours and credits per semester):

	Lecture	*Tutorial*	*Laboratory*	*Practical*	*Other:*	*Total*
Contact Hours	45	13	Nil	Nil	Nil	58
Credit	3	*1*	*Nil*	Nil	Nil	3

3. Additional private study/learning hours expected for students per week.

2hrs

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge (a, e)**		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.1	*An ability to apply principles of engineering, mathematics, and science in application of Engineering & Technology.*	*Lectures, tutorials and independent study assignments.*	*Home assignments of 10 points and Quizzes.Exam-1*
1.2	*Ability to model engineering problems.*	*Animations of fundamentals of Energy conversion and problems on it* *Power point presentation on different topic related to this subject*	*Examining the progress through Exam 1 and Exam 2, each of 20 points, Final exam of 40 points*
1.3	*An ability to use engineering skills, tools and techniques necessary for engineering practices.*	*No lab*	---
2.0	**Cognitive Skills**		
2.1	*Ability to think critically and analytically*	*Regularity during lecture classes is essential.*	*Class participation*
2.2	*Ability to develop tests in the areas covered at different levels.*	*Revising class instructions to keep up to date on the subject is key to learning*	*Peer/group response*
2.3	*Ability to produce test items in areas studied.*	*Time Management is always important to be free from burden of the subject*	*Reports writing on various topics*
2.4	*Time Management is always important to be free from burden of the subject.*	*Joint study sessions amongst students reduce doubts, promotes learning* *Solving the home assignments and worksheets is needed for practice*	*In-term and final.*
3.0	**Interpersonal Skills & Responsibility**		
3.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion and Evaluation*

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
3.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour s and writing group reports, Work in groups for solving certain problems Assessing communicative Skills*	*Conducting group writing and group reports, Work in groups for solving certain problems*	*Assessing communicative Skills*
4.0	**Communication, Information Technology, Numerical**		
4.1	*Work in groups and independently and Manage resources, time and other members of the group.*	*Solve the problems by asking sequential questions*	*Homework Discussion And Evaluation.*
4.2	*Communicate results of work to others and Help the student to solve the problem by asking questions during the office hour*	*Conducting group writing and reports, Work in groups for solving certain problems...*	*Assessing communicative Skills*
4.3	*Use of web internet and Use of PowerPoint and laptop – projector systems*	*Writing reports on topics*	*Discussion, Questioning during topics*
4.4	*Use of the advanced features in scientific calculators.*	*Incorporating the use and utilization of computer in the course requirements electronic copy of the lectures was distributed*	*Highlighting the concepts and principles through real life problems*
5.0	**Psychomotor**		
5.1	NA	NA	NA

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	*First Major Exam*	*After 6th Week*	20
2	*Second Major Exam*	*After 12th Week*	20

3	*Final Exam*	*After 15th Week*	40
4	*Quizzes*	*Week 5,11*	10
5	*Homework assignments*	*Week 4, 6,12*	10

D. Student Academic Counseling and Support

• *SUNDAY*	• *10.00 A.M. TO 12.00 NOON*
• *MONDAY*	• *10.00 A.M. TO 12.00 NOON*
• *WEDNESDAY*	• *12.00 NOON TO 2.00 P.M.*

E. Learning Resources

1. List Required Textbooks :

- *Energy Conversion Systems by Harry A. Sorensen,(Washington State University) Jhon Wiley and Sons*
- *Van Wylen , G.J. and Sonntag, R.E. Fundamentals of Classical Thermodynamics, SI, Version, Jhon Wiley & Sons, Inc, New Yark,1976*

2. List Essential References Materials :

- *NA*

3. List Recommended Textbooks and Reference Material :

- *As mentioned above*

4. List Electronic Materials :

- *ComSol (Machine Design,Strength of Materials,*
- *Data design Book*

5. Other learning material :

- *Walters,S.commercial fuel cellsMechanical engineering, Feb,1974*
- *http://www.springer.com/engineering/mechanical+engineering/journal/231*
- *http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc*

F. Facilities Required

1. Accommodation

- *Lecture Rooms*
- *Energy Conversion Lab*
- *Developing a E.C. laboratory where simple demonstration to show the experimental validation of theory should be developed.*

2. Computing resources

- *Proper projector system*

79. Other resources.

- *NA*

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- *Direct interaction with different group of students.*
- *As per routine: being practiced in the college.*
- *Course evaluation forms filled by students attending the course.*

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :

- *NA*

3 Processes for Improvement of Teaching :

- *Training for solving more exercise sessions.*
- *Workshops to facilitate the exchange of experiences amongst faculty members.*
- *Regular meetings where problems are discussed and solutions given.*
- *Attending professional development conferences.*
- *Industrial Interaction on trends*

4. Processes for Verifying Standards of Student Achievement

- *Samples of students' assignments and exams are collected every semester and reviewed with faculty members.*
- *Examine students by basic concept questions on subject after completion of semester.*
- *Result of students also reflects the standard of knowledge.*
- *Group discussions on various subject topics should be conducted and assessed by the senior faculty member*

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- *Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.*

Course Specification Approved
Department Official Meeting No (1/34/9767) Date 25 /01 /1436 *H*

Course's Coordinator		Department Head	
Name :	Ali Vakkar	***Name :***	Dr. Saleh Al Dahash
Signature :	.....	***Signature :***	.....
Date :	20/ 03 / 1437-38 *H*	***Date :***	20/ 03 / 1437-38 *H*