جامعة المجمعة
Majmaah University

كلية الهندسة
College of Engineering

Mechanical Engineering Program
Course Specifications

المملكة العربية السعودية
وزارة التعليم
جامعة المجمعة
كلية الهندسة

Kingdom of Saudi Arabia
Ministry of Education
Majmaah University
College of Engineering

Mechanical Engineering Curriculum

Mechanical Power

Freshman

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	-
MATH 105	Differential Calculus	3	(3,1,0)	-
GE 101	Fundamentals of Engineering Technology	2	(1,0,2)	-
GE 102	Fundamentals of Engineering Drawing	3	(1,0,4)	-
GE 103	Engineering Mechanics (Statics)	3	(3,1,0)	-
PHY 103	General Physics	4	(3,1,2)	-
		17		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MATH 106	Integral Calculus	3	(3,1,0)	MATH 105
MATH 107	Algebra and Analytical Geometry	3	(3,1,0)	-
ME 111	Mechanical Measurements	2	(1,1,2)	GE 101
ME 121	Mechanical Engineering Drawing	3	(1,0,4)	GE 102
GE 108	Engineering Mechanics (Dynamics)	3	(3,1,0)	GE 103
GE 105	Engineering Chemistry	3	(3,1,0)	-
		17		

Sophomore

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	-
MATH 204	Differential Equations	3	(3,1,0)	MATH 106 MATH 107
ME 212	Manufacturing Processes	3	(2,1,2)	GE 101
ME 251	Material Engineering	3	(2,1,2)	GE 103
ME 243	Machine Dynamics	3	(3,1,0)	GE 108
ME 231	Thermodynamics I	3	(3,1,0)	-
		17		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
EE 210	Electrical and Electronic Circuits	3	(3,1,0)	-
STAT 201	Statistics and Probability	3	(3,1,0)	-
ME 222	Machine Elements Design	3	(2,1,3)	ME 121 ME 232
ME 232	Mechanics of Materials	3	(3,1,0)	ME 251
ME 242	Mechanical Vibrations	3	(3,1,0)	ME 243
ME 252	Thermodynamics II	2	(2,1,0)	ME 231
		17		

Junior

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	-
GE 306	Engineering Report Writing	2	(2,0,0)	STAT 201
ME 323	Mechanical Design	3	(2,1,3)	ME 222
ME 343	System Dynamics	2	(2,1,0)	ME 242
ME 353	Fluid Mechanics	4	(3,1,2)	ME 252
EE 398	Electrical Machines	2	(2,1,0)	EE 210
CEN 307	Computer Programming for Mechanical Engineering	3	(2,0,2)	-
		18		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	-
MATH 254	Numerical Methods	3	(3,1,0)	MATH 204
ME 344	Automatic Control	2	(2,1,0)	ME 343 ME 353
ME 354	Heat Transfer	3	(3,1,0)	ME 353
ME 355	Refrigeration & Air conditioning	3	(2,1,2)	Cor. ME 354
ME 356	Turbulent flow	3	(3,1,0)	ME 353
ME 357	Membrane Desalination Processes	2	(2,1,0)	Cor. ME 354
		18		

ME 399	Engineering Practice	0

Senior

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	-
GE 407	Engineering Economy	2	(2,1,0)	-
ME 458	Turbo Machines	3	(3,1,0)	ME 356
ME 459	Internal Combustion Engines	3	(3,1,0)	ME 252
ME 46X	Elective (1)	3	(3,1,0)	XXX
ME 493	Mechanical Power Lab. (I)	1	(0,0,2)	ME 111
ME 498	Senior Design 1	2	(1,0,2)	-
		16		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	-
GE 408	Engineering Project Management	2	(2,1,0)	GE 407
ME 460	Power Plants	3	(3,1,0)	ME 354
ME 46X	Elective (2)	3	(3,1,0)	XXX
ME 46X	Elective (3)	3	(3,1,0)	XXX
ME 494	Mechanical Power Lab. (2)	1	(0,0,2)	ME 493
ME 499	Senior Design 2	2	(1,0,2)	ME 498
		16		

Design and Production

Freshman

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
MATH 105	Differential Calculus	3	(3,1,0)	
GE 101	Fundamentals of Engineering Technology	2	(1,0,2)	
GE 102	Fundamentals of Engineering Drawing	3	(1,0,4)	
GE 103	Engineering Mechanics (Statics)	3	(3,1,0)	
PHY 103	General Physics	4	(3,1,2)	
		17		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MATH 106	Integral Calculus	3	(3,1,0)	MATH 105
MATH 107	Algebra and Analytical Geometry	3	(3,1,0)	
ME 111	Mechanical Measurements	2	(1,1,2)	GE 101
ME 121	Mechanical Engineering Drawing	3	(1,0,4)	GE 102
GE 108	Engineering Mechanics (Dynamics)	3	(3,1,0)	GE 103
GE 105	Engineering Chemistry	3	(3,1,0)	
		17		

Sophomore

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
MATH 204	Differential Equations	3	(3,1,0)	MATH 106 MATH 107
ME 212	Manufacturing Processes	3	(2,1,2)	GE 101
ME 251	Material Engineering	3	(2,1,2)	GE 103
ME 243	Machine Dynamics	3	(3,1,0)	GE 108
ME 231	Thermodynamics I	3	(3,1,0)	
		17		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
EE 210	Electrical and Electronic Circuits	3	(3,1,0)	
STAT 201	Statistics and Probability	3	(3,1,0)	
ME 222	Machine Elements Design	3	(2,1,3)	ME 121 ME 232
ME 232	Mechanics of Materials	3	(3,1,0)	ME 251
ME 242	Mechanical Vibrations	3	(3,1,0)	ME 243
ME 252	Thermodynamics II	2	(2,1,0)	ME 231
		17		

Junior

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
GE 306	Engineering Report Writing	2	(2,0,0)	STAT 201
ME 353	Fluid Mechanics	4	(3,1,2)	ME 252
ME 343	System Dynamics	2	(2,1,0)	ME 242
ME 323	Mechanical Design	3	(2,1,3)	ME 222
EE 398	Electrical Machines	2	(2,1,0)	EE 210
CEN 307	Computer Programming for Mechanical Engineering	3	(2,0,2)	
		18		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
MATH 254	Numerical Methods	3	(3,1,0)	MATH 204
ME 354	Heat Transfer	3	(3,1,0)	ME 353
ME 344	Automatic Control	2	(2,1,0)	ME 343 ME 353
ME 313	Material Removal Processes	3	(2,1,2)	ME 212 ME 232
ME 333	Materials Selection in Design and Manufacturing	3	(2,1,2)	ME 212 ME 232
ME 345	Fault Diagnosis of Mechanical Systems	2	(1,1,2)	ME 232 ME 343
		18		

ME 399	Engineering Practice	0

Senior

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
GE 407	Engineering Economy	2	(2,1,0)	
ME 424	Computer Aided Design	3	(2,0,3)	ME 323
ME 414	Metal Forming Processes	3	(2,1,2)	ME 212 ME 232
ME 43X	Elective (1)	3	(2,1,2)	ME 232
ME 491	Design and Production Lab (1)	1	(0,0,2)	ME 111
ME 498	Senior Design 1	2	(1,0,2)	
		16		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
GE 408	Engineering Project Management	2	(2,1,0)	GE 407
ME 415	Computer Aided Manufacturing	3	(2,1,2)	ME 212 ME 424
ME 42X	Elective (2)	3	(2,1,2)	ME 212 ME 323
ME 41X	Elective (3)	3	(2,1,2)	XXX
ME 492	Design and Production Lab (2)	1	(0,0,2)	ME 491
ME 499	Senior Design 2	2	(1,0,2)	ME 498
		16		

Industrial Engineering

Freshman

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
MATH 105	Differential Calculus	3	(3,1,0)	
GE 101	Fundamentals of Engineering Technology	2	(1,0,2)	
GE 102	Fundamentals of Engineering Drawing	3	(1,0,4)	
GE 103	Engineering Mechanics (Statics)	3	(3,1,0)	
PHY 103	General Physics	4	(3,1,2)	
		17		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MATH 106	Integral Calculus	3	(3,1,0)	MATH 105
MATH 107	Algebra and Analytical Geometry	3	(3,1,0)	
ME 111	Mechanical Measurements	2	(1,1,2)	GE 101
ME 121	Mechanical Engineering Drawing	3	(1,0,4)	GE 102
GE 108	Engineering Mechanics (Dynamics)	3	(3,1,0)	GE 103
GE 105	Engineering Chemistry	3	(3,1,0)	
		17		

Sophomore

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
MATH 204	Differential Equations	3	(3,1,0)	MATH 106 MATH 107
ME 212	Manufacturing Processes	3	(2,1,2)	GE 101
ME 251	Material Engineering	3	(2,1,2)	GE 103
ME 243	Machine Dynamics	3	(3,1,0)	GE 108
ME 231	Thermodynamics I	3	(3,1,0)	
		17		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
EE 210	Electrical and Electronic Circuits	3	(3,1,0)	
STAT 201	Statistics and Probability	3	(3,1,0)	
ME 222	Machine Elements Design	3	(2,1,3)	ME 121 ME 232
ME 232	Mechanics of Materials	3	(3,1,0)	ME 251
ME 242	Mechanical Vibrations	3	(3,1,0)	ME 243
ME 252	Thermodynamics II	2	(2,1,0)	ME 231
		17		

Junior

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
GE 306	Engineering Report Writing	2	(2,0,0)	STAT 201
ME 353	Fluid Mechanics	4	(3,1,2)	ME 252
ME 343	System Dynamics	2	(2,1,0)	ME 242
ME 323	Mechanical Design	3	(2,1,3)	ME 222
EE 398	Electrical Machines	2	(2,1,0)	EE 210
CEN 307	Computer Programming for Mechanical Engineering	3	(2,0,2)	
		18		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
MATH 254	Numerical Methods	3	(3,1,0)	MATH 204
ME 354	Heat Transfer	3	(3,1,0)	ME 353
ME 344	Automatic Control	2	(2,1,0)	ME 343 ME 353
ME 371	Industrial Operations Research I	3	(3,1,0)	MATH 107
ME 372	Quality Management	3	(3,1,0)	STAT 201
ME 373	Reliability & Maintenance Engineering	2	(2,1,0)	STAT 201
		18		

ME 399	Engineering Practice	0

Senior

Fall Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
GE 407	Engineering Economy	2	(2,1,0)	
ME 474	Industrial Operations Research II	3	(3,1,0)	ME 371
ME 475	Computer Aided Design & Manufacturing	3	(2,1,2)	ME 212 ME 323
ME XXX	Elective (1)	3	(3,1,0)	XXX
ME 495	Work Study Lab	1	(0,0,2)	ME 111
ME 498	Senior Design 1	2	(1,0,2)	
		16		

Spring Semester

Code	Course Title	Credit Hours	Contact Hours	Prerequisite
MURE	University Requirement	2	(2,0,0)	
GE 408	Engineering Project Management	2	(2,1,0)	GE 407
ME 476	Industrial Operations Management	3	(3,1,0)	MATH 107
ME XXX	Elective (2)	3	(3,1,0)	XXX
ME XXX	Elective (3)	3	(3,1,0)	XXX
ME 496	Human Factors Engineering Lab	1	(0,0,2)	ME 495
ME 499	Senior Design 2	2	(1,0,2)	ME 498
		16		

Course	Page
GE 101	1
GE 102	7
GE 108	15
ME 111	23
ME 121	31
ME 212	39
ME 222	45
ME 231	55
ME 232	61
ME 242	67
ME 243	77
ME 251	83
ME 252	89
ME 313	97
ME 323	103
ME 343	111
ME 344	117
ME 353	125
ME 354	131
ME 355	139
ME 356	147
ME 357	155
ME 415	163
ME 428	171
ME 459	179
ME 460	187

GE 101

Course Specifications

Institution: Majmaah University	Date of Report 14/1/2015
College/Department Mechanical and Industrial Engineering	

A- Course Identification and General Information

1. Course title and code: Fundamentals of Engineering Technology GE 101			
2. Credit hours: 2			
3. Program(s) in which the course is offered: College Requirement			
4. Name of faculty member responsible for the course:			
5. Semester/year at which this course is offered: fall semester, freshman year			
6. Pre-requisites for this course:			
7. Co-requisites for this course: NA			
8. Location: main campus NA			
9. Mode of Instruction			
a. Traditional classroom	√	What percentage?	90
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments: This subject is theoretical therefore power point presentation and e- learning is more suitable for the students.			

B- Objectives

1. 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.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- 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	1	2
Engineering materials: Material Properties and Their Applications	2	4
Bench and Fitting Work	2	4
First major 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.
(For the semester not a specific requirement in each week) ----

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

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned

	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 learned 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 workshop machines • Engage students in classroom interaction with making practice	(i) Methods of assessment of students cognitive skills • Homework assignments, exams, and quizzes.
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. • Students learn to manage their time in self-study of the coarse engineering technology	(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	(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. • Recording of submission of assignment and the grades.

		assignments carries penalties or loss of grade points. • Participation of students in classroom discussion.	
4.0	Communication, Information Technology, Numerical		
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	During 6, 7, 8th Weak	15
2	Second Major Exam	During 12, 13, 14th Weak	15
3	Final Exam	Final exam week	40
4	Quiz		15
5	Homework assignments		15

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) a- Weekly office hours b- Meetings and discussions on Blackboard/D2L

E- Learning Resources

1. List Required Textbooks • Singh, R. "Introduction to Basic Manufacturing Processes and Workshop Technology", 2010 New Age International (P) Ltd., Publishers
2. List Essential References Materials (Journals, Reports, etc.) • NA
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Production Engineering by K.C. Jain , A.K. Chitale
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) 1. Lecture material in PPT
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • Not required

F- Facilities Required

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

seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom b- workshop

2. Computing resources (AV, projector, Smart board, software, etc.) • Proper projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • 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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • 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.

GE 102

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department Mechanical and Industrial Engineering	

A- Course Identification and General Information

1. Course title and code: Fundamentals of Engineering Drawing GE 102			
2. Credit hours: 3			
3. Program(s) in which the course is offered: College requirement			
4. Name of faculty member responsible for the course			
5. Semester/year at which this course is offered: fall semester, freshman year			
6. Pre-requisites for this course: none			
7. Co-requisites for this course: none			
8. Location: main campus main campus			
9. Mode of Instruction			
a. Traditional classroom	√	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B- Objectives

1. What is the main purpose for this course?
   - Understand the importance of Eng. Drawing.
   - Practice of dimensioning of drawings.
   - Undertake different geometric objects, projections of straight lines, planes and solids.
   - Take up different orthographic projections.
   - Draw sectional views, development of surface of different solids.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

   - Use of data show presentation and video section (Very important)

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction, Skills of freehand sketching, Basics of lettering.	1	1
Methods of projection and orthographic.	2	2
Projection using drawing tools.	2	2
Dimensioning of views.	2	2
Third view prediction.	3	3
Auxiliary views, Intersections of surfaces and bodies.	2	2
Isometrics, Sectional views.	3	3

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	15	0	60	0	0	75
Credit	15	0	30	0	0	45

3. Additional private study/learning hours expected for students per week. 5

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

- Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;

An understanding of the definition, necessary background and importance of the subject of Engineering Drawing, apply he basic terminology, concepts, principles and theories of it in order to:

- Be able to make free hand lettering and numbering,
- Be able to use drawing instruments,

- Understand the relation between 3D and multiview projections,
- Practice dimensioning of drawings,
- Draw sectional views, and
- Develop surface of different solids.

• A description of the teaching strategies to be used in the course to develop that knowledge or skill;

- Design and conduct projects

• The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

Home and class work, Midterm Tests -2 x 20 marks after every one month of teaching, Test for students who were absent, Improvement tests at an interval of 1 month well spread, Daily or weekly homework assignments are required and reviewed - 10, End semester – 40 marks, 10 marks for assignments activities and attendance.

	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 engineering drawing and their application.	• Formal lectures. • Group works and discussions. • Physical problems applications of theoretical concepts through group projects.	• Daily or weekly homework assignments are required and reviewed. • Class participation. • Formal Tests. • Midterm exam. • Final written exam
2.0	Cognitive Skills		
2.1	• Ability to think critically and analytically.	• Formal lectures. • Group works and discussions. • Lab activities, self-learning, thinking lab • Physical problems applications of theoretical concepts through group projects.	• Class participation • Formal Tests • Homework and classwork assignments
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 behavior in conducting research • Group assignments where much of the most effective learning comes from the student explaining, discussing and defending her own ideas with her peers.	• Homework assignments will attest to the student's ability to fulfill 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 drawing tools such drawing software. • Use of the Internet. • Use of PowerPoint and laptop – projector systems.	• Lecture • Lab	• 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 drawing tools.
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	Participation, Homework, classwork Assignments	All along	10
2	Project	All along	10
3	First Major Exam	Week 7	20
4	Second Major Exam	Week 13	20
5	Final Exam	Final exam week	40

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) • Weekly office hours • Meetings and discussions on Blackboard/D2L

E- Learning Resources

1. List Required Textbooks • Gary Robert, Eric N wiebe, " Fundamentals of graphics Communications," McGraw Hill, 2006 • William Howard, Joe Musto, " Introduction to solid Modeling Using Solid Works," McGraw Hill, 2005
2. List Essential References Materials (Journals, Reports, etc.) The Fundamentals of Engineering Drawing: With an Introduction to Interactive Computer Graphics for Design and Production (11th Edition) Warren J. Luzadder, Jon M. Duff.
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Fundamentals of engineering drawing by Cecil Howard, Jay D. Helsel
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) http://pioneer.netserv.chula.ac.th/~kjirapon/lecture-note.html
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • AutoCAD. • Solid works. • Solid Edge

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Classroom • Workshop.

2. Computing resources (AV, projector, Smart board, software, etc.) • Laptop computer • projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) None

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) None

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.

GE 108

Course Specifications

Institution: Majmaah University	Date of Report: 19-01-2015
College/Department: College Of Engineering / Department of Mechanical and Industrial Engineering	

A- Course Identification and General Information

1. Course title and code: GE 108 Engineering Mechanics (Dynamics)
2. Credit hours: (3,1,0)
3. Program(s) in which the course is offered: College requirement
4. Name of faculty member responsible for the course: Dr. Vakkar Ali
5. Semester/year at which this course is offered: spring semester, freshman year
6. Pre-requisites for this course: GE 103
7. Co-requisites for this course: None
8. Location: main campus
9. Mode of Instruction

a. Traditional classroom	√	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B- Objectives

1. What is the main purpose for this course?

After completing this course, the student must be able to:

- Be familiar with the basic concepts of dynamics.
- Understand the principles governing the motion of particles, velocity and acceleration;
- Understand the principles of Newton's Second Law and its applications;
- Understand kinetics of particles in momentum methods
- Understand kinematics of rigid bodies.

Summary of the main learning outcomes for students enrolled in the 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

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

At this level of engineering the addition will burden the students in extra as the extension of this subject is studied by the students in their individual branches based on the requirement of their branch. The extent of the syllabus forms the basis and core of the next level of this subject with different subject codes and names in different branches.

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to Engineering Mechanics; Defining important terms.	1	3
Kinematics of Particles: Rectilinear Motion	3	9
Kinematics of Particles: Curvilinear Motion	2	6
Kinetics of Particle: Newton's Second Law & Equations of motion.	3	9
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.	3	9
Work and energy. Impulse and momentum. Principle of Conservation of Energy.	1	3
Gyroscopic motion. Introduction to mechanical vibrations.	1	3

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	1	0		0	45
Credit	3	1	0			4

3. Additional private study/learning hours expected for students per week. Study at home: Minimum 3 to 4 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	A basic level of understanding of study of the geometry of motion	Remove subject paranoia from the minds of students by slowly starting with simple explanations and simple problems and then moving towards complex areas of the subject.	First major exam, second major exam, Quizzes, Assignments
1.2	May be able to deal with study of system of forces and motion produced by these forces	Boosting the students releases the pressure on the brain. Brain under pressure is occupied with various thoughts and stories about the subject. Preoccupied brain with previous information could not think with an unbiased and logical mind, and so it becomes hard for it to understand even simple things. So any means which relaxes the brain pressure gives it a chance to analyze and think.	First major exam, second major exam, Quizzes, Assignments
1.3	Should be able to use this subject as a tool for engineering problems	Engineering mechanics- dynamics rules form the basis to be used in the latter part of the subject when the discussion shifts towards kinetics of particle and then subsequently towards kinematics and kinetics of rigid bodies.	First major exam, second major exam, Quizzes, Assignments
2.0	Cognitive Skills		
2.1	Imagery & Mental rehearsal	Any information received is just useless	Assignments

		until it becomes a belief. Our brain receives 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.	
2.2	Relaxation and self-talk	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	Assignments and Quizzes
3.0	Interpersonal Skills & Responsibility		
3.1	NA		
3.2	NA		
4.0	Communication, Information Technology, Numerical		
4.1	NA		
4.2	NA		
5.0	Psychomotor		
5.1	NA		
5.2	NA		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	7th Week	15%
2	Second Major Exam	13th week	15%
3	Final Exam	Final exam week	40 %
4	Quiz	3rd, 4th week, 9th and 10th week	10%
5	Homework assignments	4th , 9th, 12th and 15th week	20%

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
• Weekly office hours • Meetings and discussions on Blackboard/D2L

E- Learning Resources

1. List Required Textbooks Hibbeler, R.C., Engineering Mechanics: Dynamics, Seventh Edition, Prentice Hall.
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Scientific journals in the area (give exact titles) Vector Mechanics for Engineers: Dynamics, by F. P. Beer, E. R. Johnston, and William E. Clausen, published by McGraw-Hill.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Classroom • Developing a laboratory where simple demonstration to show the experimental validation of theory should be developed.
2. Computing resources (AV, projector, Smart board, software, etc. Not needed at the moment
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G- Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Course Evaluation Survey filled by students

- Interactive learning in the class.
- Course evaluation questionnaire

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

Faculty Peer Assessment
Direct discussion, of the authorities concerned, with students during student's Interactive sessions/meetings.

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

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

- Review of the course delivered after the Final examinations.
- Review of course files 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.

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.

- 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 middle of the semester.
- Review of course-report at the beginning of following semester.
- Analysis of student feedback at end of semester.

ME 111

Course Specifications

Institution: Majmaah University	Date of Report: 14/01/2015
College/Department: College of Engineering/ Department of Mechanical Engineering	

A- Course Identification and General Information

1. Course title and code: Mechanical Measurement ME 111
2. Credit hours: 2
3. Program(s) in which the course is offered: Bachelor degree in Mechanical Engineering
4. Name of faculty member responsible for the course: Dr. Mohammad Nadeem Khan
5. Semester/year at which this course is offered: spring semester, freshman year
6. Pre-requisites for this course: GE 101
7. Co-requisites for this course:
8. Location: Main Campus
9. Mode of Instruction

a. Traditional classroom	√	What percentage?	80
b. Blended (traditional and online)		What percentage?	
c. e-learning	√	What percentage?	20
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

Some numerical analysis software are required to make this subject more interesting and strength

B- Objectives

- What is the main purpose for this course?
  - Apply knowledge of mathematics, science, and engineering.
  - Design and conduct experiments, as well as analyze and interpret data.
  - To achieve familiarity with and experience in the use of commonly available measuring devices and instruments in a variety of applications
  - To develop an awareness and understanding of more extensive and elaborate measuring systems
  - To acquire a reasonable level of competence in the design, construction, and execution of a mechanical measurements project

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- 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
Basic Concepts of Measurement Methods	2	2
Uncertainty Analysis	1	1
Static and Dynamic Characteristics of Signals	1	1
Measurement System Behavior	3	3
Probability and Statistics	1	1
Analogue Electrical Devices and Measurements	1	1
Sampling, Digital Devices, and Data Acquisition	2	2
Temperature, Pressure and Velocity Measurements	4	4
Total	15	15

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	15	15		30		60
Credit	01			01		02

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

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 understanding of the definition, necessary background and importance of the subject of Mechanical Measurements, in addition to the ability 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 total 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. .
2.0	Cognitive Skills		
2.1	• 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.	• 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		
3.1	To develop and improve students' skills in experimental data acquisition.	Carrying out individual assignment, which	Assessing the contribution of each student in the group to

	To develop capacity for self-directed learning through individual assignments which requires web search for sensor information and reporting	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 (3-4 students).	the content and style of technical reports submitted by each group
3.2	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.	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.	Assessments of each student individual assignment
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	Each student is required to contribute in setting up lab. Experiment and carry out measurements of physical variable.	Gradual increase in the involvement of each group in participating of setting experiment and collecting experimental data Replicating experimental data is required for uncertainty analysis.	Psychomotor skills will be assessed based on measurements bias and random errors reported in technical report submitted. Observation of teaching assistant during execution of lab. Experiments for participation of each student in the group.

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	Quiz	14th week	10
5	Homework assignments	Weekly	10

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) a- Weekly office hours b- Meetings and discussions on Blackboard/D2L

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 (Journals, Reports, etc.) A.J. Wheeler and A.R. Ganji, Introduction to Engineering Experimenntation, Prentice Hall, 1996
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) A.J. Wheeler and A.R. Ganji, Introduction to Engineering Experimentation, Prentice Hall, 1996
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) Any Related material including the YouTube videos relating to engineering measurement
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. NA

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom b- Laptop/ board/ broad marker

2. Computing resources (AV, projector, Smart board, software, etc.) Labview, data acquisition software
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) 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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 121

Course Specifications

Institution: Majmaah University	Date of Report: 6/1/2015
College/Department: College of Engineering/ Mechanical and Industrial Engineering Department	

A. Course Identification and General Information

1. Course title and code: Mechanical Engineering Drawing ME 121			
2. Credit hours: 3(1,0,4)			
3. Program(s) in which the course is offered: B.Sc. Mechanical and Industrial Engineering			
4. Name of faculty member responsible for the course: Dr. Tarek EL-Bagory			
5. Semester/year at which this course is offered: spring semester, freshman year			
6. Pre-requisites for this course (if any): GE 102			
7. Co-requisites for this course (if any): NA			
8. Location if not on main campus: In the Main Building			
9. Mode of Instruction			
a. Traditional classroom	*	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B. Objectives

1. What is the main purpose for this course?

- Be able to draw mechanical elements,
- Be able to apply geometrical and dimensional tolerances,
- Practice assembly drawings,
- Be able to use drawing software packages for drawing both mechanical elements and assembly drawings,
- Skills of hand drawing of sketches,
- Fundamentals of computer graphics and the use of Auto Cad computer drafting software,
- Fits and tolerance; Machine components; Structural drawing; assembly drawing.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Electronic materials and video of Auto cad experiments will be utilized to support the lecture course material,
- The course hand out was distributed in a soft copy form (lecture slides),
- 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
Fundamentals of computer graphics and the use of Auto Cad computer drafting software.	3	15
Geometrical and dimensional tolerances.	2	10
Applications on mechanical elements (bolts).	2	10
Applications on mechanical elements (riveted joints).	1	5
Applications on mechanical elements (shafts and keys).	1	5
Applications on mechanical elements (gears).	1	5
Applications on mechanical elements (coupling).	2	10
Applications on assembly and working drawings (valves, presses etc.)	3	15
Total	15	75

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

	Lecture	Tutorial	Laboratory	Practical	Other	Total
Contact Hours	15	0	60	Nil	Nil	75
Credit	15	0	30	Nil	Nil	45

3. Additional private study/learning hours expected for students per week.
10-12 hours per week on an average for self-study and problem solving. | 10-12 |

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

- A brief summary of the knowledge or skill the course is intended to develop;
  a. Fundamentals of computer graphics and the use of Auto Cad computer drafting software,
  b. Be able to apply geometrical and dimensional tolerances,
  c. Drawing for machine components (bolts, nuts, flange couplings, and connecting rod),
  d. Drawing for machine components (riveted joints, shafts and keys),
  e. Drawing for machine components (gears, valves, and presses),
  f. Make a full drawing for gear box, coupling, and valves.

- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
  a. Problems solving – Sample problems and exercise problems,
  b. Interactive problem solving through well defined, planned and searching questions,
  c. Assignment problems for applications.

- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
  a. Interactive problem solving with students,
  b. Asking students to cite applications in real life,
  c. Assignment problems, Exercise / tutorial problems for applications,
  d. Quizzes and major exams that will test the student's knowledge.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Fundamentals of computer graphics and the use of Auto Cad computer drafting software,	In-class lecturing where the previous knowledge is linked to the current and future topics,	In class discussion,
1.2	Be able to apply geometrical and dimensional tolerances,	In-class discussions,	quizzes
1.3	Drawing for machine components (bolts, nuts, flange couplings, and connecting rod),	Homework assignments,	Major and final exams,
1.4	Drawing for machine components (riveted joints, shafts and keys),	Tutorial discussions,	Evaluation of lab reports,
1.5	Drawing for machine components (gears, valves, and presses),	Conducting experiments (Lab. Work),	Regularly asking questions on different topics and concepts,
1.6	Make a full drawing for gear box, coupling, and valves.	Emphasis on understanding concepts and illustrating applications to problems,	Interactive problem solving with students,
1.7		Solving problems through assignments on each topic,	Assignment problems, Exercise / tutorial problems for applications that will force the students to

			think and apply the knowledge gained.
1.8		Background materials from the books are provided,	
1.9		Extensive interaction with students.	
2.0	Cognitive Skills		
2.1	Thinking through problems solving, reasoning for each problem solved,	Examples solving during the lecture	Two Midterm exams
2.2	Remembering equations and principles,	In-class discussion	Homework assignments
2.3	Reasoning in solving a problem step by step.	Homework assignments	Class activities
2.4		Tutorial	Laboratory assignments
2.5		Interactive problem solving with students,	Laboratory exam
2.6		Asking searching questions on topic fundamentals.	Final exam
2.7			Asking students to solve the problem in class.
3.0	Interpersonal Skills & Responsibility		
3.1	Work in a group and independently	Solve the problems by asking sequential questions	Laboratory exams
3.2	Manage resources, time and other members of the group	Conducting group experiments and writing group reports	Assessment of the laboratory reports
3.3	Communicate results of work to others	Work in groups for solving certain problems.	Grading homework assignments.
3.4	Help the student to solve the problem by asking questions during the office hour		
4.0	Communication, Information Technology, Numerical		
4.1	Use the computer for analyzing and processing the experimental data.	Writing laboratory reports	Discussion, Questioning during topics,
4.2		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,
4.3			Asking the students to solve the numerical part and check that the answers are tallying with background notes.
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	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

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

- Every day one hour is marked as Office Hour in the Time Table of teaching staff,
- During this hour the students can consult the teacher individually on a one to one basis or seek academic advice,
- In all, teaching staff is available at least for 8 hours per week for academic advice beyond lectures and tutorials.

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

- "A Manual of engineering drawing Practice", C. H. Simons and E. E. Maguire, Hodder and Stoughton. "Manual of Auto cad 2004".
- Geometric and Engineering Drawing" K . Morling, Third Edition, 2010.
- "Machine Drawing" K.L. Narayana, P. Kannaiah, and K. Venkata Reddy, 2006

2. List Essential References Materials (Journals, Reports, etc.)

- "Engineering Design Graphics", James H. Earle, AutoCAD 2004, Pearson Education Inc.
- "Engineering Drawing" with a primer on AutoCAD, Archad Noor etc. Prentice-Hall 2004.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

Journal of Mechanical Engineering 54 (2008)12
ISSN: 0039-2480

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

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

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Lecture room available,
- Auto cad laboratory.
- 003-4-37-1

2. Computing resources (AV, data show, Smart Board, software, etc.) NA
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Availability of equipment relevant to the course material

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Student feedback during the semester, • Course evaluation by student, • Students- faculty meetings.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • Departmental council discussions, • Discussions within the group of faculty teaching the course, • Ask the students if the speed of teaching and the approach is helping the students in learning the subject.
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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • Providing samples of all kind of assessment in the departmental course collection of each course, • Conducting standard exams, • Independent checking of End-Semester assessment, • Checking of course files by the Quality Centre Nominee and give suggestions for improvement in writing.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Middle semester review of course files, • End Semester review of course files, • Student feedback at end of the semester, • Feedback of the assessment at the beginning of the next semester, • Workshop at the beginning of the next semester on improvements suggested.

ME 212

Course Specifications

Institution: Majmaah University	Date of Report 3-2-2015
Engineering / Mechanical and Industrial	

A- Course Identification and General Information

1. Course title and code: Manufacturing Processes ME 212
2. Credit hours: 3
3. Program(s) in which the course is offered: General elective available in many programs
4. Name of faculty member responsible for the course: Dr. Saleh Ahmed Aldahash
5. Semester/year at which this course is offered: fall semester, sophomore year
6. Pre-requisites for this course: GE 101
7. Co-requisites for this course:
8. Location: main campus
9. Mode of Instruction

a. Traditional classroom		What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B- Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum) Build up knowledge of an understanding of different manufacturing processes, their features and areas of applications. Ability to compare the advantages and limitations of different manufacturing processes.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department) Updating of course material, references, assessment and changes questions.

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to manufacturing processes	1,2,3	9
Casting processes	4	3
Bulk deformation processes: Rolling, Forging, Extrusion, and wire/tube drawing	5,6	6
Midterm First Exam	7	
Sheet metal working: deep drawing, planking and punching … etc	8	3
Principles of metal cutting	9,10,11	9
Joining processes	12	3
Rapid manufacturing	13	3
Processing of powder of polymers, metals and ceramics	14	3
Midterm Second Exam	15	
Final Exam	16	

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15		30		90
Credit	2			1		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 1.2	To define different manufacturing processes, their features and areas of applications. To compare the advantages and limitations of different manufacturing processes.	Lecture using - Power point - Illustrative schematic diagrams - Small group discussion.	- Oral exam - Written exam
2.0	Cognitive Skills		
2.1 2.2	To differentiate between different types of manufacturing processes. To analyze products with respect to manufacturing processes.	Lecture using - Power point - Illustrative schematic diagrams - Small group discussion.	- Practical exam - Assignment - Written exam
3.0	Interpersonal Skills & Responsibility		
3.1	To demonstrate students' projects by research and communicate with each other's to present their idea.	-Small group discussion - Lecture - Lab	- Practical exam - Assignment - presentation
4.0	Communication, Information Technology, Numerical		
4.1	To illustrate topics by using machines	Student practical	Case study
5.0	Psychomotor		
5.1	To experiment new product to understand it's manufacturing processes.	-Small group discussion - workshop	- Practical exam - Assignment

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	Homework / participation	Throughout	5
2	First Major Exam	7th week	20
3	Second Major Exam	15th week	15
4	Final Exam	16th week	40
5	Project / Logbook	6th, 14th week	10
6	Practical Exam	15th week	10

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) 3 hours per week

E- Learning Resources

1. List Required Textbooks Textbook: Groover, M.P. (2006). Fundamentals of Modern Manufacturing (4th ed.) Textbook: Rajput, R.K. (2007) Manufacuring Tengnology (Manufacuring processes) (1st ed.)
2. List Essential References Materials (Journals, Reports, etc.) Gordon, M. 1996, Introduction to manufacturing applications (http://dl.acm.org/citation.cfm?id=256580)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Boothroyd, G. 1994, Product design for manufacture and assembly, Computer-Aided Design
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. - Using power point program - YouTube

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Classroom • workshop
2. Computing resources (AV, projector, Smart board, software, etc.) a- Projector b- Smart board
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Materials (Metal, Plastic and sand) required for workshop

G- Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Exams • Logbook • Web based online student questionnaire at the end of semester.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • Faculty Peer review • Student feedback.
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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

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.

ME 222

Course Specifications

Institution: Majmaah University	Date of Report: 19-01-2015
College/Department : College Of Engineering / Department of Mechanical and Industrial Engineering	

A- Course Identification and General Information

1. Course title and code: Machine Element Design ME 222
2. Credit hours: 3 (2,1,3)
3. Program(s) in which the course is offered: Mechanical Engineering
4. Name of faculty member responsible for the course: Dr. Vakkar Ali
5. Semester/year at which this course is offered: spring semester, sophomore year
6. Pre-requisites for this course: ME 121, ME 232
7. Co-requisites for this course: None
8. Location: main campus
9. Mode of Instruction

a. Traditional classroom	√	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments: The subject is mathematical therefore the traditional class room teaching is most suitable.

B- Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum) Summary of the main learning outcomes for students enrolled in the course.

The major outcome are:

- An understanding of the definition, necessary background and importance of the subject of Machine Element Design
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.
- Students are able to design the Machine Elements and able to work on software related to this course.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Better utilization of Machine Element Design laboratory so that students can experience the practical application of the theory and Practical..

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	3
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	5
Design of welded	1.5	5

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	43	14	28	NIL	NIL	85
Credit	3	0	0	00	00	3

3. Additional private study/learning hours expected for students per week. *2hr*

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

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or

skill;

- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

	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 1- The course has been designed to cover various aspects of fundamentals of Design 2- The basic objective is to develop a practical understanding of Machine and Designing of Machine Elements 3- In the present state of the art technology, it is of prime importance to use mathematical modeling and software for designing Machine Elements	Teaching strategies to be used to develop that knowledge • Lectures, tutorials and independent study assignments. • Animations of fundamentals of Machine Design • Power point presentation on different topic related to this subject. • Individual assignments require use of library reference material and web sites to identify	Methods of assessment of knowledge acquired 1. Home Assignments of 5 points 2. Examining the progress through Exam 1 and Exam 2, each of 20 points 3. Final assessment of the knowledge through final end term examination of 40 points
2.0	Cognitive Skills		
2.1	Description of cognitive skills to be developed • Ability to think critically and analytically • Ability to develop tests in the areas covered at different levels. • Ability to produce test items in areas studied. • Ability to retain information by understanding material • Decrease dependence on memorization	Teaching strategies to be used to develop these cognitive skills • Regularity during lecture classes is essential. • Revising class instructions to keep up to date on the subject is key to learning. • Time Management is always important to be free from burden of the subject • Joint study sessions amongst students	Methods of assessment of students cognitive skills 4. Class participation 5. Peer/group response 6. Project 7. In-term and final exams

		reduce doubts, promotes learning and competitiveness. • Notes must be prepared based on the instructions in class and information given in the book. • Regularly asking questions and clearing the doubts is very important. • Solving the home assignments and worksheets is needed for practice.	
2.2	Relaxation and self-talk	• 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	• Assignments and Quizzes
3.0	Interpersonal Skills & Responsibility		
3.1	Description of the interpersonal skills and capacity to carry responsibility to be developed • 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	Teaching strategies to be used to develop these skills and abilities • Creating interest in the subject through simple models and problems • Individual counseling to cover weaknesses and difficulties in the subject • Developing relation of theory with application of the subject through various thermal systems • Discussions with students on ethical behavior to	Methods of assessment of students' interpersonal skills and capacity to carry responsibility • Active class participation • Home assignments • Check the inclinations and interest of the students in the subject area. • Performance on midterms and final exams

		promote for higher studies • Individual interaction on the subject to promote research projects	
4.0	Communication, Information Technology, Numerical		
4.1	Description of the skills to be developed in this domain. • Use of Mathematical package and such as Data book, software • Use of the internet • Use of PowerPoint and laptop – projector systems • Use of the advanced features in scientific calculators	Teaching strategies to be used to develop these skills • Encourage students to consult the specialist in the computer lab for help on web-based material. • Purchasing related software within the department • Use of PowerPoint when giving presentations in projects • Solving problems using related software and numerical method • Students will be asked to deliver summary regarding certain topics related to the course. • Each student is expected to prepare and present one topic/seminar regarding the subject.	Methods of assessment of students numerical and communication skills • 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	Methods of assessment of students numerical and communication skills • Some marks for the use of web-based	Not applicable	Not applicable

	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		
5.2	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 14th Week	40
4	Quiz	Week 5,11	10
5	Homework assignments and lab	4th , 9th, 12th and 15th week	20

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) a- Weekly office hours b- Meetings and discussions on Blackboard/D2L

E- Learning Resources

List Required Textbooks 1. Introduction To Machine Design" V. B. BHANDARI, Tata McGraw-Hill Education, 2001 2. Mechanical Engineering Design, Shigley, Mischke, Budynas, McGraw Hill, 7th Ed, 2003
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Scientific journals in the area (give exact titles) • Electronic Materials, Web Sites etc • http://www.springer.com/engineering/mechanical+engineering/journal/231 • http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc- /
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) • ComSol (Machine Design,Strength of Materials, • Data design Book
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • http://www.faculty.virginia.edu/ribando/modules

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Lecture Rooms • Machine Element Design Lab (2D-62) • Developing a laboratory where simple demonstration to show the experimental validation of theory should be developed.
2. Computing resources (AV, projector, Smart board, software, etc.) • Proper projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • NA

G- Course Evaluation and Improvement Processes

Course Evaluation Survey filled by students 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 Faculty Peer Assessment Direct discussion, of the authorities concerned, with students during student's Interactive sessions/meetings.
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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) Samples of student works will be reviewed by another instructor assigned by the department. • Review of the course delivered after the Final examinations. • Review of course files 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. 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. • 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 middle of semester.
- Review of course-report at the beginning of following semester.
- Analysis of student feedback at end of semester.

ME 231

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department Engineering/ Mechanical	

A- Course Identification and General Information

1. Course title and code: Thermodynamics ME 231			
2. Credit hours:			
3. Program(s) in which the course is offered: Mechanical Engineering			
4. Name of faculty member responsible for the course: Dr. Adulaziz Alklaibi			
5. Semester/year at which this course is offered: fall semester, sophomore year			
6. Pre-requisites for this course:			
7. Co-requisites for this course:			
8. Location: main campus			
9. Mode of Instruction			
a. Traditional classroom	x	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B- Objectives

1. What is the main purpose for this course? Concepts and definitions, Properties of pure substances, Different forms of energy, Concepts of Heat and work. First law of thermodynamics. Applications of first law on closed system and control volume. Second law of thermodynamics. Entropy, isentropic efficiency. Some power and refrigeration cycles (including Rankin Cycle, vapor compression cycle, Otto cycle, Diesel cycle, Brayton cycle).
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) The course report written at the end of the semester forms the basis of any development and improvement of the course. A committee is formed to view the course report. The recommendations of this committee are raised to the department council for approval.

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Concepts and definitions	1	3
Properties of pure substances	1	3
Different forms of energy	2	6
Concepts of energy, heat and work	1	3
First law of thermodynamics	1	3
Properties of pure substances and evaluating properties	2	6
Applications of first law on closed system and control volume	2	6
Second law of thermodynamics	2	6

2. Course components (total contact hours and credits per semester): 45

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

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

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	apply the ideal gas model for thermodynamic analysis.	Lecture - discussion	written exam - quizzes
1.2	understand key concepts related to the second law of thermodynamics.	Lecture - discussion	written exam - quizzes
2.0	Cognitive Skills		
2.1	apply closed system energy balances, to model closed systems.	Lecture - discussion	written exam - quizzes
2.2	analyze the Carnot cycle, assess the performance of power cycles and refrigeration and heat pump cycles.	Lecture - discussion	written exam - quizzes
3.0	Interpersonal Skills & Responsibility		
3.1	Perform air-standard analyses of internal combustion engines based on the Otto, Diesel, and Perform air-standard analyses of gas turbine power plants based on the Brayton cycle.	Lecture - discussion	written exam - quizzes
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	develop and analyze thermodynamic models of vapor power plants based on the Rankine cycle.	Lecture - discussion	written exam - quizzes
4.2			
5.0	Psychomotor		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	6	15
2	Second Major Exam	6	15
3	Final Exam	Final exam week	40
4	Quiz	Each other week	20
5	Homework assignments	On a weekly basis	10

D- Student Academic Counseling and Support

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

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

E- Learning Resources

1. List Required Textbooks Fundamentals of Engineering Thermodynamics, 7th Edition, SI by Michael J. Moran, Howard N. Shapiro. Thermodynamics : an engineering approach by Y Cengel and M. Boles
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Scientific journals in the area (Applied Thermal Engineering)
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Classroom

2. Computing resources (AV, projector, Smart board, software, etc.) projector
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

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

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 232

Course Specifications

Institution: Majmaah University	Date of Report: 6/1/2015
College/Department: College of Engineering/ Mechanical and Industrial Engineering Department	

A. Course Identification and General Information

1. Course title and code: Mechanics of Materials 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. Name of faculty member responsible for the course: Dr. Tarek EL-Bagory			
5. Semester/year at which this course is offered: spring semester, sophomore year			
6. Pre-requisites for this course (if any): ME 251			
7. Co-requisites for this course (if any): NA			
8. Location if not on main campus: In the Main Building			
9. Mode of Instruction			
a. Traditional classroom	*	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B Objectives

1. 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.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)
   - 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 per week on an average for self-study and problem solving — 4-6hours

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, major Term Test and End semester tests which will compel the student to think and apply concepts and principles learned.
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 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.
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.
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	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

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

- Every day one hour is marked as Office Hour in the Time Table of teaching staff,
- During this hour the students can consult the teacher individually on a one to one basis or seek academic advice,
- In all, teaching staff is available at least for 8 hours per week for academic advice beyond lectures and tutorials.

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 (Journals, Reports, etc.)
Engineering Fracture Mechanics
Journal of Materials Design and Applications
International Journal of Fracture

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
Engineering Fracture Mechanics
Journal of Materials Design and Applications
International Journal of Fracture

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • Handouts

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • 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 (AV, data show, Smart Board, software, etc.) • Computer and internet
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • 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 Behavior 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 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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)\ • 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.

ME 242

Course Specifications

Institution: Majmaah University	Date of Report: 6/1/2015
College/Department: College of Engineering/ Mechanical and Industrial Engineering Department	

A. Course Identification and General Information

1. Course title and code: Mechanical Vibration 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. Name of faculty member responsible for the course: Dr. Tarek EL-Bagory			
5. Semester/year at which this course is offered: spring semester, sophomore year			
6. Pre-requisites for this course (if any): GE 305			
7. Co-requisites for this course (if any): NA			
8. Location if not on main campus: In the Main Building			
9. Mode of Instruction			
a. Traditional classroom	*	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B -Objectives

1. 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.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- 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 per week on an average for self-study and problem solving	4-6hours

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	Analyzing 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, homework, two midterm examination and one final examination. Examinations are comprehensive, including subjects from all assigned readings, lectures, and classroom demonstrations.
1.3	Analyzing vibration response of a single degree of freedom system under general forcing condition	Tutorials review the content of each lecture.	Quizzes and homework 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. First Major Exam to measure Knowledge and understanding, b. Second Major Exam 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	Examinations are	

	analysis of one-DOF-systems - free vibrations, transient and steady-state forced vibrations, viscous and hysteric damping.	comprehensive, including subjects from all assigned readings, lecture, and classroom 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 specialized 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, homework, 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 homework 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 knowledge throughout life.		Tools: • First Major Exam to measure Knowledge and understanding, • Second Major Exam to measure Knowledge and 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, homework, 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 homework 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: • First Major Exam to measure Knowledge and understanding, • Second Major Exam 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	Lectures, tutorials and	Attendance of lectures

	used in daily life.	self-learning assignments.	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.
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, homework, 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 homework 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 major exams 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

	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

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

- Every day one hour is marked as Office Hour in the Time Table of teaching staff,
- During this hour the students can consult the teacher individually on a one to one basis or

seek academic advice,

- In all, teaching staff is available at least for 8 hours per week for academic advice beyond lectures and tutorials.

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

2. List Essential References Materials (Journals, Reports, etc.)
   - 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 (Journals, Reports, etc)

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

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.
   - Handouts

F. Facilities Required

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

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - Lecture room
   - 003-3-27-1 (Sunday)
   - 003-3-27-1 (Tuesday)
   - 003-3-27-1 (Thursday)

2. Computing resources (AV, data show, Smart Board, software, etc.)
   - Computer and internet

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - None

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 Behavior 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

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- 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.

ME 243

Course Specifications

Institution: Majmaah University	Date of Report March 18, 2015
College/Department	

A- Course Identification and General Information

1. Course title and code: Machine Dynamics ME 243			
2. Credit hours: 3(3,1,0)			
3. Program(s) in which the course is offered: Mechanical Engineering			
4. Name of faculty member responsible for the course: Dr Chandra Mouli			
5. Semester/year at which this course is offered: fall semester, sophomore year			
6. Pre-requisites for this course: GE 108			
7. Co-requisites for this course: NA			
8. Location: Main campus			
9. Mode of Instruction			
a. Traditional classroom	Yes	What percentage?	95
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other	Yes	What percentage?	5
Comments:			

B- Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum)

The students after completion of this course will be able to apply principles of engineering, mathematics, and science in designing the machine, mechanism, kinematics and kinetics in addressing the dynamics of machines.

The students will understand the mechanics of components like gears/gear trains, flywheels, cams etc., for better interface and power transmissions to design engineering system.
They will be able to use engineering skills, tools and techniques necessary for dynamic force analysis, balancing of rotating masses and analytical skills to model the engineering problem.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
General Concepts, Velocity and Acceleration Analysis	3	9
Grashof rules, transmission angle and time ration	1	3
Design of ordinary gear trains and analysis of epicyclical gear trains, simple, and compound gear trains	2	6
Balancing of revolving and reciprocating masses	2	5
Balancing of single and multi-cylinder engines. Variation of tractive force, swaying couple, hammer blow	2	6
Design of flywheel	3	9
Force analysis on linkages and machinery	2	7
Total	15	45

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	45					45

3. Additional private study/learning hours expected for students per week. 01

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 and applying principles	Emphasis on practice based learning.	Asking the students on to practices exercises
1.2	Design of machine components such as flywheel, gears etc,	Always citing real life examples to create interest	Through questions at the end each class
2.0	Cognitive Skills		
2.1	Revision and recapitulating in the beginning of class and asking students to recall the contents of previous class	Allowing the students to solve problems during exercise/tutorial with hint or without it	Asking questions to refresh the concepts
2.2	Involving the students to solve problems	Reviewing after completion of every chapter whether they understood and allowing them to summarize	Solving exercise problems so that they keep learning throughout
3.0	Interpersonal Skills & Responsibility		
3.1	Motivating through Group discussions among the students	Asking definitions, applications etc. discussions and sharing	Discussions in class room
3.2	Motivating through Group discussions among the students	Asking definitions, applications etc. discussions and sharing	Discussions In class room
4.0	Communication, Information Technology, Numerical		
4.1	Communicating with use of technical words related to the courses contents	Showing some models, rigid bodies and asking them to apply rules and terminologies	Through exercise and assignments
5.0	Psychomotor		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	07	20
2	Second Major Exam	12	20
3	Final Exam	Final exam week	40
4	Quiz	05, 10	10
5	Homework assignments	03, 11	10

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) • Weekly office hours • Meetings and discussions on Blackboard/D2L

E- Learning Resources

1. List Required Textbooks 1) Mechanism and dynamics of Machinery, John Wiley and Sons,
2. List Essential References Materials (Journals, Reports, etc.) 1) Mechanisms and Machines, EWP publication, Ghosh and Mallick, 2) Analysis of Mechanisms and Machinery , KAU Center for Sci. Publ. Jeddah, 1991, by M. Akyurt
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc. Theory of Machine, S. Chand publication, R.S. Khurmi,
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) Books are available on SDL and net to download and read
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. The subject requires more practice to become confident in solving the problems.

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Classroom

2. Computing resources (AV, projector, Smart board, software, etc.)
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

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.

ME 251

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department: College of Engineering, Department of Mechanical & Industrial Engineering	

A- Course Identification and General Information

1. Course title and code: Material Engineering ME 251			
2. Credit hours: 3(3,1,2)			
3. Program(s) in which the course is offered.	Mechanical Engineering		
4. Name of faculty member responsible for the course:	Dr. Chandra Mouli		
5. Semester/year at which this course is offered:	fall semester, sophomore year		
6. Pre-requisites for this course:	GE 103		
7. Co-requisites for this course:	Not Available		
8. Location:	Main campus		
9. Mode of Instruction			
a. Traditional classroom		What percentage?	95
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	5
Comments:			

B- Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum)

   a- Know the fundamental science and engineering principles relevant to materials.
   b- Understand the microstructure, properties and processing of materials.
   c- Have the experimental and computational skills for a professional career or graduate study in materials.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

C- Course Description

Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction, Importance of Materials Engineering, Classification of materials	01	03
Molecular bonding, Properties and micro structure, Crystal geometry Atomic Movement and rearrangement	02	06
Properties of Materials, Elastic and Plastic behavior, Stress strain diagrams	01	03
Phase diagrams and solid phase solutions, Iron carbon Diagram Disorder in solids	02	06
Applications of Metals, Classifications, Manufacturing processes	02	07
Corrosion and failure	02	06
Applications of Ceramics, Classifications, Manufacturing processes	02	06
Applications of Polymers and composites, Classifications, Manufacturing processes	02	06
Total	13	43

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45	15	30			90
Credit	45	0	15			60

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	Application various materials and uses	Emphasis on practice based learning.	Asking the students and to practices objective and descriptive questions
1.2	Understand the properties of materials	Always citing practice examples to create interest	Through questions at the end each class
2.0	Cognitive Skills		
2.1	Revision and recapitulating in the beginning of class and asking students to recall the contents of previous class	Allowing the students to draw the diagrams and solve problems during tutorial hours with hint or without it	Asking questions to refresh the concepts
2.2	Involving the students to solve problems	Reviewing after completion of every chapter whether they understood and allowing them to summarize	Solving exercise problems so that they keep learning throughout
3.0	Interpersonal Skills & Responsibility		
3.1	Motivating through participating in groups discussions	Asking definitions, rules applications etc. discussions and sharing	Discussions in class room
3.2	Ability to think and suggest new materials and applications	Asking basics applications and discussions on why and what	Discussions In class room
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	Through assignments
5.0	Psychomotor		
5.1			
5.2			

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

D- Student Academic Counseling and Support

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

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

E- Learning Resources

1. List Required Textbooks
- Materials Science and Engineering - An Introduction, W.D. Callister, 7 ed, John Wiley, 2007.

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Elements of Materials Science and Engineering, L.H. Van Vlack, Addison-Wesley Publishing Co, 1985.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F- Facilities Required

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

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
- Classroom
- Laboratory

2. Computing resources (AV, projector, Smart board, software, etc.)

Class Room, Smart board

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Universal testing Machine Hardness tester Microscopes

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 252

Course Specifications

Institution: Majmaah University	Date of Report
College/Department : Dept. of Mechanical & Industrial engineering	

A- Course Identification and General Information

1. Course title and code: Thermodynamics II ME 252			
2. Credit hours: 2 (2-1-0)			
3. Program(s) in which the course is offered: Bachelor degree: Mechanical Engineering Program			
4. Name of faculty member responsible for the course: Iskander Tlili			
5. Semester/year at which this course is offered: spring semester, sophomore year			
6. Pre-requisites for this course: ME 251			
7. Co-requisites for this course: None			
8. Location: main campus			
9. Mode of Instruction			
a. Traditional classroom	√	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B- Objectives

1. What is the main purpose for this course? Irreversibility and availability. Thermodynamic relations. Mixtures and solutions. Chemical reactions and combustion. Phase and Chemical equilibrium. Thermodynamics of compressible flow. Applications using computer.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) - Field visits. - Increased use of IT or web-based reference material

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Irreversibility and availability.	3	6
Thermodynamic relations.	2	4
Chemical reactions and combustion.	3	6
Phase and Chemical equilibrium.	2	4
Thermodynamics of compressible flow.	3	6
Applications using computer.	2	4

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	30	0	0	0	0	30

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

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	Students will demonstrate basic understanding of the concept of exergy (energy availability) and exergy analysis of thermodynamic systems.	Lectures, Assignments, at home, Discussions in the Class, Case study Report (data collection, Internet search, and reporting), Mini project (Design - Hardware / Software Development), Supervised	Quizes: to assess understanding of thermodynamic fundamentals Case Study (Report): to assess technical report writing simulation abilities. Discussion Groups: to assess interactive and communication abilities.
1.2	Understanding the thermodynamic analysis of reacting mixtures and the applications in analysis of combustion processes	Collaborative Training, Supervised and video Clips	Midterm Exams: to assess understanding of thermodynamic fundamentals, problem solving and analytical and design capabilities. Final Exam: to assess understanding of different aspects of combustion processes, design capabilities, analytical skills and ability to solve thermodynamic problems. Group Mini project: to assess practical hands-on, team work, report writing, ability to deal with Chemical reaction, and design of thermodynamics systems.
2.0	Cognitive Skills		
2.1	Designed to introduce the student to the application of cognitive skills utilizing thermodynamics knowledge in practical project, generate and analyze experimental data.	Lectures, Assignments at home, Discussions in the Class, Case study Report (data collection, Internet search, and reporting) Mini project (Design - Hardware / Software Development), supervised	Quizzes: to assess understanding of thermodynamic fundamentals Case Study (Report): to assess technical report writing simulation abilities. Discussion Groups: to assess interactive and communication abilities.
2.2	Students will gain the ability to write project reports.	Summer Training, Supervised Collaborative Training,	Midterm Exams: to assess understanding of thermodynamics

		Supervised and Video Clips	fundamentals, problem solving and analytical and design capabilities. Final Exam: to assess understanding of different aspects chemical reaction, design capabilities, analytical skills and ability to solve thermodynamics problems. Group Mini project: to assess practical hands-on, team work, report writing, ability to deal with combustion, and design of thermodynamics systems.
3.0	Interpersonal Skills & Responsibility		
3.1	Decision making of materials selection for a certain job	Lectures	Quizzes: to assess understanding of thermodynamics fundamentals
3.2	Ideas development and sharing with others	Assignments, at home	Case Study (Report): to assess technical report writing simulation abilities.
3.3	Creative thinking	Discussions in the Class	Discussion Groups: to assess interactive and communication abilities.
3.4	Team work	Case study Report (data collection, Internet search, and reporting)	Midterm Exams: to assess understanding of thermodynamics fundamentals, problem solving and analytical and design capabilities.
3.5	Problem Solving	Mini project (Design - Hardware / Software Development), Supervised	Final Exam: to assess understanding of different aspects in the thermodynamics problem.
		Summer Training, Supervised	
		Collaborative Training, Supervised	
4.0	Communication, Information Technology, Numerical		
4.1	An ability to understand the concept of exergy (energy availability) and exergy analysis of thermodynamic systems.	Lectures	Quizzes: to assess understanding of thermodynamics

			fundamentals
4.2	An ability to understanding how thermodynamic relations are used in evaluation of thermodynamic properties.	Assignments, at home	Case Study (Report): to assess technical report writing simulation abilities.
4.3	An ability to understanding thermodynamic properties of ideal gas mixtures and the fundamentals of psychometrics and to learn how to apply the fundamentals of conservation of mass and energy, and properties of ideal gas mixtures in design and analysis of psychometric systems.	Discussions in the Class	Discussion Groups: to assess interactive and communication abilities.
4.4	An ability to understand the thermodynamic analysis of reacting mixtures and the applications in analysis of combustion processes	Case study Report (data collection, Internet search, and reporting)	Midterm Exams: to assess understanding of thermodynamic analysis of reacting mixtures and the applications in analysis of combustion processes.
		Mini project (Design - Hardware / Software Development), Supervised	Final Exam: to assess understanding of different aspects in thermodynamics design systems.
		Summer Training, Supervised	Group Mini project: to assess practical hands-on, team work, report writing, ability.
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		20
2	Second Major Exam		20
3	Final Exam	Final exam week	40
4	Quiz		10
5	Homework assignments		10

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
   a- Weekly office hours
   b- Meetings and discussions on Blackboard/D2L

E- Learning Resources

1. List Required Textbooks
Borgnakke M.J. and Sonntag H.N., Fundamentals of Engineering Thermodynamics, 7th Edition, John

Wiley and Sons, Inc., 2009.
2. List Essential References Materials (Journals, Reports, etc.) - 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,2011.
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Scientific journals in the area (give exact titles)
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) http://ocw.mit.edu/high-school/physics/kinetic-theory-thermodynamics/laws-of-thermodynamics/
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. - CATT-3 software Download from the textbook's student companion site: (http://bcs.wiley.com/he-bcs/Books?action=index&bcsId=4321&itemId=0470041927) - ComSol (Heat transfer, fluid flow, Acoustics…). - Thermofluid software springer (Thermofluid).

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom

2. Computing resources (AV, projector, Smart board, software, etc.) - Laptop computer - projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) 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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

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.

ME 313

Course Specifications

Institution: Majmaah University	Date of Report March 18, 2015
College/Department: Mechanical & industrial Engineering	

A- Course Identification and General Information

1. Course title and code: Material removal processes ME 313			
2. Credit hours: 3 (2,1,2)			
3. Program(s) in which the course is offered. Bachelor degree in Mechanical Engineering			
4. Name of faculty member responsible for the course:			
5. Semester/year at which this course is offered: spring semester, junior year			
6. Pre-requisites for this course: ME 212			
7. Co-requisites for this course: NA			
8. Location: main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	x	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B- Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum)

An understanding of the definition, necessary background and importance of the subject of Material Removal Processes, in addition to the ability to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to:

- Understand: Mechanics of chip formation, Cutting forces and power, Effect of temperature on cutting and tool life, Metal removal rate, Cutting tool materials and cooling fluids used.
- Be familiar with different Machining processes,
- Be familiar with latest techniques in cutting process, e.g. Non-conventional machining and Numerical control of machine tools.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

a. Increased use of IT or web-based reference material and videos
b. 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
Introduction to metal removal processes	1,2	6
Fundamentals of cutting. Mechanics of chip formation. Cutting forces and power. Effect of temperature on cutting	3,4,5	9
Machining processes: turning, thread cutting, boring, drilling, reaming, milling, shaping and planning, broaching, gear cutting	6,7,8	9
Tool life. Metal removal rate, Cutting tool materials and fluids.	9.10,11	9
Abrasives, grinding wheels, grinding processes. Super finishing process: Lapping, honing, and Blasting.	12,13	6
Non-conventional machining. Numerical control of machine tools.	14,15	6

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	30			75
Credit	30	--	15			45

3. Additional private study/learning hours expected for students per week. 5

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	• Understanding Fundamentals of cutting. Mechanics of chip formation. Cutting forces and power. Effect of temperature on cutting • Understand the types of machine conventional and conventional • Be familiar with finishing machines	• Many practical cases in workshop • Problems solving – Sample problems and exercise problems, • Assignment problems for applications. • Web – based materials	Attendance of lectures, labs and tutorials is a most. Homework assignments
1.2			
2.0	Cognitive Skills		
2.1	• Analysis & decomposition associated with engineering design & manufacture • Synthesis including effective use of CAE technology • Application and analysis of the limitations and context of engineering principles • Skill of communicating in Teams	• Lectures are followed by numerous examples, some of which are practical in nature, to illustrate the application theories • Tutorials are used to explain further the theories and to help the students to apply them in solving problems • Engage students in Guiding Students in their workshop and assignments	• Class participation • Formal tests • Homework assignments
2.2			
3.0	Interpersonal Skills & Responsibility		
3.1	• Work in groups and independently • Manage resources, time and other members of the group • Communicate results of work to others • Help students to solve the problem by asking questions during the office hour.	• Solve the problems by asking sequential questions, • Work in groups for solving certain problems.	• Homework discussion and evaluation, • Assessing communicative skills.
3.2			

4.0	Communication, Information Technology, Numerical		
4.1	• Use of Internet. • Use of PowerPoint and laptop – projector systems. • Use of the advanced features in scientific calculators	Incorporating the use and utilization of computer in the course requirements (electronic copy of the textbook was distributed).	Discussion, Questioning during topics
4.2			
5.0	Psychomotor		
5.1	NA		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	Within the sixth week	20
2	Second Major Exam	Within the twelfth week	20
3	Final Exam	Final exam week	40
4	Quiz	Before major exams	10
5	Homework assignments	At end of each topic	10

D- Student Academic Counseling and Support

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

a- Weekly office hours 2
b- Meetings and discussions on Blackboard/D2L 1

E- Learning Resources

1. List Required Textbooks
M.P. Groover, "Fundamentals of Modern Manufacturing: Materials, Processes and Systems," Prentice-Hall, International, 2011

2. List Essential References Materials (Journals, Reports, etc.)

- N/A

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
a- Metal Cutting Mechanics, Viktor P. Astakhov, CRC Press LLC, 1999
b- Scientific journals in the area (give exact titles)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

Lecture material in PPT

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

N/A

F- Facilities Required

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

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Classroom Lecture room equipped with blackboard, data show, computer, and internet
2. Computing resources (AV, projector, Smart board, software, etc.) a. Laptop b. projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • N/A

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • Providing samples of all kind of assessment in the departmental course collection of each course, • Conducting standard exams, • Independent checking of End-Semester assessment, • Checking of course files by the Quality Centre Nominee and give suggestions for improvement in writing. 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. • Review of Course files, • Student feedback at end of the semester, • Feedback of the assessment at the beginning of the next semester, • Workshop at the beginning of the next semester on improvements suggested. 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.

ME 323

Course Specifications

Institution: Majmaah University	Date of Report: 6/1/2015
College/Department: College of Engineering/ Mechanical and Industrial Engineering Department	

A. Course Identification and General Information

1. Course title and code: Mechanical Design ME 323			
2. Credit hours: 3(2,1,3)			
3. Program(s) in which the course is offered: B.Sc. Mechanical and Industrial Engineering			
4. Name of faculty member responsible for the course: Dr. Tarek EL-Bagory			
5. Semester/year at which this course is offered: fall semester, junior year			
6. Pre-requisites for this course (if any): ME 222			
7. Co-requisites for this course (if any): NA			
8. Location if not on main campus: In the Main Building			
9. Mode of Instruction			
a. Traditional classroom	*	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B Objectives

1. What is the main purpose for this course?

- Apply knowledge of mathematics, science, and engineering,
- Design a system, component, or process to meet desired needs,
- 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.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- 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
Introduction. Design methodology (concept, alternatives, and considerations,	2	12
Skills of teamwork, reports, and construction and detail drawings of machines).	2	12
Comprehensive design projects include: fixed and moveable joints, shafts, sliding and rolling bearings.	4	24
Comprehensive design projects include: gears, couplings, clutches and brakes, belt drivers.	4	24
Use of standards and technical manuals.	2	12
Application of computer programs.	1	6
Total	15	90

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	45	Nil	Nil	90
Credit	30	-	15	Nil	Nil	45

3. Additional private study/learning hours expected for students per week.
10-12 hours per week on an average for self-study and problem solving — 10-12

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

- A brief summary of the knowledge or skill the course is intended to develop;
  a. To learn about the type of gears, rolling element bearings, couplings, and clutches,
  b. To develop the skills of idealization of gears and shaft design,

c. Make a full design journal bearings,
d. Draw bending moment and torque diagrams for shaft,
e. Draw constructional drawing for shaft,
f. Make a full design of brake,
g. To learn about fasteners joint.

- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
  d. Problems solving – Sample problems and exercise problems,
  e. Interactive problem solving through well defined, planned and searching questions
  f. Assignment problems for applications
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
  a. Interactive problem solving with students,
  b. Asking students to cite applications in real life,
  c. Assignment problems, Exercise / tutorial problems for applications,
  d. Quizzes and major exams that will test the student's knowledge.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains and Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	To learn about the type of gears, rolling element bearings, couplings, and clutches,	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 gears and shaft design,	Emphasis on understanding concepts and illustrating applications to problems,	Interactive problem solving with students,
1.3	Make a full design journal bearings,	Solving problems through assignments on each topic,	Placing before the class mind provoking and thinking questions,
1.4	Draw bending moment and torque diagrams for shaft,	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	Draw constructional drawing for shaft, coupling, belt, and gear box,	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 quizzes major and final exams which will compel student to think and apply concepts and principles learned.
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 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.
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.
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	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

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

- Every day one hour is marked as Office Hour in the Time Table of teaching staff,
- During this hour the students can consult the teacher individually on a one to one basis or seek academic advice,
- In all, teaching staff is available at least for 8 hours per week for academic advice beyond lectures and tutorials.

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 "Design of Machine Elements", 3E, V. B. BHANDARI, Tata McGraw-Hill Education, 2010
2. List Essential References Materials (Journals, Reports, etc.) "Mechanical Engineering Design", Shigley, Mischke, Budynas, McGraw Hill, 7th Ed, 2003.
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Standard Code of Rolling element bearing, • American Society of testing and materials ASTM Standard, • Materials & Design Imprint: ELSEVIER ISSN: 0261-3069 • International Journal of Mechanics and Materials in Design: Springer ISSN: 1569-1713 (print version) ISSN: 1573-8841 (electronic version)
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) * Sufficiently of Material available on the net.
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • Abaqus Program, • AutoCAD Program, • Above listed material is more than enough. Most important is the practice of solving the problems.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Lecture room available, • To avoid student movement it is necessary to keep lectures for one course / level in the same classroom. (As far as possible). • 003-4-573-1 (Sunday) • 003-3-26-1 (Tuesday) • 003-4-52-1 (Thursday)

2. Computing resources (AV, data show, Smart Board, software, etc.) NA
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) NA

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Importance of feedback should be first explained. Only then the feedback should be taken, • Have a question as to how the teaching can be improved – speed, more problems etc.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • Ask the students if the speed of teaching and the approach is helping the students in learning

the subject.
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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • Independent checking of End-Semester assessment, • Checking of course files by the Quality Centre Nominee and give suggestions for improvement in writing.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Middle of the semester review of course files, • End Semester review of course files, • Student feedback at end of the semester • Feedback of the assessment at the beginning of the next semester, • Workshop at the beginning of the next semester on improvements suggested.

ME 343

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department Engineering/ Mechanical & industrial	

A- Course Identification and General Information

1. Course title and code: System Dynamics ME 343
2. Credit hours: 2 (2,1,0)
3. Program(s) in which the course is offered: Bachelor degree in Mechanical Engineering
4. Name of faculty member responsible for the course:
5. Semester/year at which this course is offered: fall semester, junior year
6. Pre-requisites for this course: ME 242 Mechanical Vibrations
7. Co-requisites for this course: NA
8. Location: main campus
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	x	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B- Objectives

2. What is the main purpose for this course? (This part must come from the main document of the curriculum)

An understanding of the definition, necessary background and importance of the subject of System Dynamics, in addition to the ability to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to:

- Understand types and forms of linkages, Mechanisms with actuators. System response to dynamic inputs.
- Be able to analyze linkages kinematically and dynamically.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

a. Increased use of IT or web-based reference material and videos
b. 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
Introduction to system dynamics	1	2
Modeling of Rigid-Body Mechanical Systems	1	2
Solution Methods for Dynamic Models	3	6
Spring and Damper Elements in Mechanical Systems	2	4
Fluid and thermal systems	2	4
Electrical and electromechanical systems	2	4
State-variable models and simulation methods	1	2
Transient Response and Block Diagram Models	2	4

2. Course components (total contact hours and credits per semester): 28

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	14	0	0	0	42
Credit	28					14

3. Additional private study/learning hours expected for students per week. 5

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	• Ability to recognize energy storing elements in mechanical systems and choose appropriate state variables. • Ability to develop ordinary differential equations (ODEs) that describe the dynamic behavior of lumped parameter systems including mechanical, fluid, thermal and electrical elements. • Ability to draw system block diagrams from the system equations and write system equations from block diagrams • Ability to demonstrate understand the Laplace transform of linear ODEs and the concept of transfer functions • - Ability to demonstrate basic understanding of feedback systems.	• Problems solving – Sample problems and exercise problems, • Interactive problem solving through well defined questions, • Assignment problems for applications. • Web – based materials	Attendance of lectures, labs. and tutorials is a most. Homework assignments
1.2			
2.0	Cognitive Skills		
2.1	• Thinking through problems solving, reasoning for each problem solved • Skill of communicating in Teams	• Examples solving during the lecture • . In-class discussion • Guiding Students in their assignments • Tutorials • Interactive problem solving with student	• Class participation • Formal tests • Homework assignments
2.2			
3.0	Interpersonal Skills & Responsibility		
3.1	• Work in groups and independently • Manage resources, time and other members of the group • Communicate results of work to others • Help students to solve the	• Solve the problems by asking sequential questions, • Work in groups for solving certain problems.	• Homework discussion and evaluation, • Assessing communicative skills.

	problem by asking questions during the office hour.		
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	• Use of Internet. • Use of PowerPoint and laptop – projector systems. • Use of the advanced features in scientific calculators	Incorporating the use and utilization of computer in the course requirements (electronic copy of the textbook was distributed).	Discussion, Questioning during topics
4.2			
5.0	Psychomotor		
5.1	NA		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	Within the sixth week	20
2	Second Major Exam	Within the twelfth week	20
3	Final Exam	Final exam week	40
4	Quiz	Before major exams	10
5	Homework assignments	At end of each topic	10

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) a- Weekly office hours b- Meetings and discussions on Blackboard/D2L

E- Learning Resources

1. List Required Textbooks William J. Palm III, System Dynamics, McGraw-Hill, 2nd Edition, 2010.
2. List Essential References Materials (Journals, Reports, etc.) • N/A
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Katsuhiko Ogata, System Dynamics, Pearson-Prentice Hall, 4th Ed., 2004. • Scientific journals in the area (give exact titles)
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) Lecture material in PPT
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. N/A

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom

2. Computing resources (AV, projector, Smart board, software, etc.) a. Laptop b. projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • N/A

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • Providing samples of all kind of assessment in the departmental course collection of each course, • Conducting standard exams, • Independent checking of End-Semester assessment, • Checking of course files by the Quality Centre Nominee and give suggestions for improvement in writing. 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. • Review of Course files, • Student feedback at end of the semester, • Feedback of the assessment at the beginning of the next semester, • Workshop at the beginning of the next semester on improvements suggested. 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.

ME 344

Course Specifications

Institution: Majmaah University	Date of Report: 26/01/2015
College/Department: Mechanical and Industrial Engineering	

A- Course Identification and General Information

1. Course title and code: Automatic Control ME 344
2. Credit hours: 03
3. Program(s) in which the course is offered. Mechanical Engineering
4. Name of faculty member responsible for the course: Dr Subhash Chandra
5. Semester/year at which this course is offered: spring semester, junior year
1. 6. Pre-requisites for this course: ME 343, ME 353
7. Co-requisites for this course: Nil
8. Location: main campus

9. Mode of Instruction (mark all that apply)

a. Traditional classroom	√	What percentage?	85
b. Blended (traditional and online)	√	What percentage?	5
c. e-learning	√	What percentage?	5
d. Correspondence		What percentage?	
f. Other	Mat Lab	What percentage?	5

Comments: Students must solve problems on Mat Lab.

B- Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum)

It is to provide students the modeling skills of Mechanical and Electrical Systems. The students will understand the transient and steady state behavior of mechanical or electrical system. The systems will be analyzed to evaluate the stability of the system in time domain and frequency domain.

The stability of the system is also analyzed using Nyquist plot, polar plot analysis. Matlab will be used to carry out Laplace inverse, time domain and frequency analysis.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

A lab component can be added to perform Matlab experiments.

C- Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to control systems	1	3
The Laplace Transform	1	3
Mathematical Modeling of Dynamic Systems	2	6
Block Diagram representation	1	3
Transient and steady state response analysis	2	5
Root locus Analysis	2	5
Control system Design by rouths stability criterion	1	4
Frequency response analysis- polar and Nyquist plot	2	5
Control system design by frequency response	2	5
Proportional, Proportional plus derivative control, proportional plus integral, and PID,	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. 1hrs

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	• Modeling of mechanical systems both translational and rotational • Transient and steady state analysis of electrical and mechanical system.	A description of the teaching strategies to be used in the course to develop that knowledge or skill; • Problem solving skills through practice and Rigor of hands on practice to solve problems • Application of Mat Lab • Assignments/quizzes and regular follow-up	• Continuous evaluation, Test I,II, quiz
1.2	• Stability analysis of systems using frequency analysis • Frequency analysis using polar plot, Nyquist plot • Design of PID controllers	• Planned delivery of topics • Interactive teaching pedagogy • Correlating theory with practice to understand the topics more easily and find the application of concept in industrial application. • Interactive learning with real time feedback	• Asking the questions during class hours about how to solve the problem and training • Assessing the assignments
2.0	Cognitive Skills		
2.1	• Capabilities are developed to model basic mechanical systems • Check the system performance overshoot, over damped, under damped and Matlab commands • 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.	• Allowing students to think to solve the problems in groups to exchange their thought and reinforce the correct. • 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 • Asking after every chapter what they understood, and let them to summarize • Asking them the formulas, equations used and how can they apply the knowledge for a	• Continuous evaluation or assessment requires them to keep revising the concepts frequently. • Giving assignments to refresh the concepts periodically to raise retention period of cognitive learning

		specific type of problem.	
2.2			
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.	• Clarity of fundamental concepts
3.2	• Group tasks, projects to work in teams	• A seminar component related to topic may be considered	• Presentation skills, ability of net surfing and e learning will be judged.
4.0	Communication, Information Technology, Numerical		
4.1	• Mathematical skills	• Making students to exercise hands on practice during tutorial or computer lab sessions.	• Monitoring the progress during exercise session
4.2	• Problem solving skills	• Assignments without direct input, but let them calculate inputs from source data	• Assessing the report, or assignment
5.0	Psychomotor		
5.1	NA		
5.2			

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	11	10
5	Homework assignments	5	10

D- Student Academic Counseling and Support

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

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

E- Learning Resources

1. List Required Textbooks
Katsuhiko Ogata, Modern control engineering, Pearson international edition, 2012

2. List Essential References Materials (Journals, Reports, etc.) R L. Narasimhan, Analysis of Linear control system, I K international, 5th edition 2013.
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Scientific journals in the area (give exact titles)
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) Books are available on SDL and net to download and read.
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. I J Nagarath and Gopal, Control systems engineering, new age international publishers, reprint 2012.proteus maintenance management software

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom b- Computer Lab is Planned

2. Computing resources (AV, projector, Smart board, software, etc.) Not Available
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) 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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 353

Course Specifications

Institution: Majmaah University	Date of Report: 14/01/2015
College/Department: College of Engineering/ Department of Mechanical Engineering	

A- Course Identification and General Information

1. Course title and code: Fluid Mechanics ME 353			
2. Credit hours: 4			
3. Program(s) in which the course is offered. Bachelor degree in Mechanical Engineering			
4. Name of faculty member responsible for the course: Dr. Mohammad Nadeem Khan			
5. Semester/year at which this course is offered: fall semester, junior year			
6. Pre-requisites for this course: ME 252 Thermodynamics II			
7. Co-requisites for this course: NIL			
8. Location: main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	√	What percentage?	80
b. Blended (traditional and online)	√	What percentage?	5
c. e-learning	√	What percentage?	15
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B- Objectives

1. What is the main purpose for this course?

The main purpose of this course are as follows

- 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.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

a. Increased use of IT or web-based reference material and videos

b. Consistently assign physical problems to students, as an application to theoretical contents

C- Course Description

Topics to be Covered

List of Topics	No of Weeks	Contact hours
Concepts and definitions	2	6
Fluid statics. Forces on submerged surfaces and bodies.	2	6
Non-viscous flow, conservation of mass, momentum and energy.	2	6
Bernoulli equation.	2	6
Dimensional analysis.	2	6
Viscous flow, pipe flow, losses in conduit flow.	3	9
Laminar and turbulent flow.	2	6
Total	15	45

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 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 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	Assessing communicative Skills.

		problems.	
4.0	Communication, Information Technology, Numerical		
4.1	Use of the 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	Quiz	14th week	10
5	Homework assignments	Weekly	10

D- Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) a- Weekly office hours b- 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 (Journals, Reports, etc.) NA
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Fundamentals of Fluid Mechanics, 5th Edition, B. R. Munson, D. F. Young, T. H. Okiishi, John Wiley & Sons, Inc., 2002.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) NA
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

NA

F- Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom b- Laptop/ board/ broad marker

2. Computing resources (AV, projector, Smart board, software, etc.)
a. Laptop b. projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) 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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 354

Course Specifications

Institution: Majmaah University	Date of Report: 19/01/2015
College/Department: College of Engineering, Dept. Mechanical and Industrial engineering	

A. Course Identification and General Information

1. Course title and code: Heat transfer ME 354			
2. Credit hours: 3(3,1,0)			
3. Program(s) in which the course is offered: Mechanical Engineering			
4. Name of faculty member responsible for the course: Dr. Vakkar Ali			
5. Semester/year at which this course is offered: spring semester, junior year			
2. 6. Pre-requisites for this course: ME 353			
3. 7. Co-requisites for this course: NIL			
8. Location: main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	√	What percentage?	*100*
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments: The subject is mathematical therefore the traditional class room teaching is most suitable.			

B. Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum)

The major outcome are :

1) An understanding of the definition, necessary background and importance of the subject of Heat Transfer.
2) Use the techniques, skills, and modern engineering tools necessary for engineering practice.
3) Students are able to design the heat transfer equipment and able to work on software related to this course.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

- Want to introduce lab of heat transfer so that students can verify and understand whatever they learn in the theory portion.
- Want to introduce some portion of mass transfer in the syllabus because that is important part of heat transfer.

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Principles of Heat Transfer.	2	6
Steady state and transient conduction in different co-ordinates, extended surfaces	2	6
Convective heat transfer	1	3
Analysis and empirical relations for forced and natural convection	3	9
Radiation heat transfer, radiation exchange between black and gray surfaces	2	6
Heat transfer applications (Heat Exchangers).	3	9
Numerical methods in heat transfer with computer applications	1	1

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	43	14	00	00	00	57
Credit	3	1	00	00	00	3

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

i) For each of the domains of learning shown below indicate:
ii) A brief summary of the knowledge or skill the course is intended to develop;
iii) A description of the teaching strategies to be used in the course to develop that

	knowledge or skill; iv) The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

	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 v) Description of the knowledge to be acquired vi) The course has been designed to cover various aspects of fundamentals of modes heat transfer i.e. conduction, convection and radiation. vii) The basic objective is to develop a practical understanding of designing of heat exchangers, boilers, condensers and various thermal systems. viii) In the present state of the art technology, it is of prime importance to use mathematical modeling and software for designing heat transfer equipment.	Teaching strategies to be used to develop that knowledge a) Lectures, tutorials and independent study assignments. b) Animations of fundamentals of heat transfer. c) Power point presentation on different topic related to this subject. d) Individual assignments require use of library reference material and web sites to identify information required to complete tasks	Methods of assessment of knowledge acquired • Home Assignments of 5 points • Examining the progress through Exam 1 and Exam 2, each of 20 points • Final assessment of the knowledge through final end term examination of 40 points
2.0	Cognitive Skills		
2.1	Description of cognitive skills to be developed ➢ Ability to think critically and analytically ➢ Ability to develop tests in the areas covered at different levels. ➢ Ability to produce test items in areas studied. ➢ Ability to retain information by understanding material ➢ Decrease dependence on memorization	Teaching strategies to be used to develop these cognitive skills Regularity during lecture classes is essential. Revising class instructions to keep up to date on the subject is key to learning. Time Management is always important to be free from burden of the subject. Joint study sessions amongst students reduce doubts, promotes learning and competitiveness. Notes must be prepared based on the instructions in class and information given in the book. Regularly asking questions and clearing the doubts is very important.	Methods of assessment of students cognitive skills • Class participation • Peer/group response • Project • In-term and final exams

		Solving the home assignments and worksheets is needed for practice.	
3.0	Interpersonal Skills & Responsibility		
3.1	Description of the interpersonal skills and capacity to carry responsibility to be developed ➢ 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	Teaching strategies to be used to develop these skills and abilities ➢ Creating interest in the subject through simple models and problems ➢ Individual counseling to cover weaknesses and difficulties in the subject ➢ Developing relation of theory with application of the subject through various thermal systems ➢ Discussions with students on ethical behavior to promote for higher studies ➢ Individual interaction on the subject to promote research projects	Methods of assessment of students' interpersonal skills and capacity to carry responsibility ➢ Active class participation. ➢ Home assignments. ➢ Check the inclinations and interest of the students in the subject area. ➢ Performance on midterms and final exams.
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	Description of the skills to be developed in this domain. Use of Mathematical package and such thermodynamic software. Use of Internet. Use of PowerPoint and laptop – projector systems. Use of the advanced features in scientific calculators	Teaching strategies to be used to develop these skills Encourage students to consult the specialist in the computer lab for help on web-based material. Purchasing related software within the department. Use of PowerPoint when giving presentations in projects Solving problems using related software and numerical method. Students will be asked to deliver summary regarding certain	Methods of assessment of students numerical and communication skills 1) Some marks for the use of web-based material in students' presentations. 2) Distribute some marks

		topics related to the course. Each student is expected to prepare and present one topic/seminar regarding the subject	in every assigned project so students know what they will be evaluated on. 3) Set marks for the PowerPoint presentation students create to give their presentations , its content and their presentation skills. 4) Set marks in doing lots of solving problems using software
4.2			
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	After 6th Week	20
2	Second Major Exam	After 12th Week	20
3	Final Exam	After 15th Week	40
4	Quiz	Week 5,11	15
5	Homework assignments	Week 6,12	05

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
• Weekly office hours • Meetings and discussions on Blackboard/D2L Thursday: 11.00 AM to 12.50 NOON Wednesday:2.00 PM to 4.00 PM Meeting and Discussion: Weekly in my office

E. Learning Resources

1. List Required Textbooks 1. Required Text(s) Incropera and De Witt, "Fundamentals of heat and mass transfer," 7th Edition, 2012. 2. Essential References Yunus A. Çengel "Heat Transfer: A Practical Approach" McGraw-Hill, 2003
2. List Essential References Materials (Journals, Reports, etc.) NA
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • http://www.springer.com/engineering/mechanical+engineering/journal/231 • http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc-BANG/Heat%20and%20Mass%20Transfer/New_index1.html • http://www.faculty.virginia.edu/ribando/modules/
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc-BANG/Heat%20and%20Mass%20Transfer/New_index1.html http://www.faculty.virginia.edu/ribando/modules/
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. A. ComSol (Heat transfer, fluid flow, Acoustics…) B. Thermofluid software springer (Thermofluid) • WinTherm heat transfer software

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a) Classroom b) Lecture Rooms c) Computer lab

G. Course Evaluation and Improvement Processes

Course Evaluation Survey filled by students 1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching a) Direct interaction with different group of students. b) As per routine: being practiced in the college. c) Course evaluation forms filled by students attending the course.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor Faculty Peer Assessment Direct discussion, of the authorities concerned, with students during student's Interactive sessions/meetings.
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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

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

- Review of the course delivered after the Final examinations.
- Review of course files 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.
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.

1) Analysis of presence and regularity of students in class.
2) Analysis of students' performance in all the examinations.
3) Analysis of all examination score.
4) Analysis of degree of interaction of students in class.
5) Direct discussion with student during individual student consultations at office.
6) Review of course file at middle of the semester.
7) Review of course-report at the beginning of following semester.
8) Analysis of student feedback at end of semester.

ME 355

Course Specifications

Institution: Majmaah University	Date of Report: 19/01/2015
College/Department: Mechanical and Industrial Engineering	

A- Course Identification and General Information

1. Course title and code: Refrigeration and Air Conditioning ME 355			
2. Credit hours: 3 (2,1,2)			
3. Program(s) in which the course is offered: Mechanical and Industrial Engineering			
4. Name of faculty member responsible for the course: Dr. Vakkar Ali			
5. Semester/year at which this course is offered: spring semester, junior year			
6. Pre-requisites for this course:			
7. Co-requisites for this course: ME 354			
8. Location: main campus			
9. Mode of Instruction			
a. Traditional classroom	√	What percentage?	1oo
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments: The subject is mathematical therefore the traditional class room teaching is most suitable.

B- Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum)

The major outcome are:

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 software related to this course.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

- 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	6
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	43	14	32	00	00	89
Credit	3	0	0	0	0	3

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

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

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

	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 e) The course has been designed to cover various aspects of fundamentals of R.A.C f) The basic objective is to develop a practical understanding of Refrigerator, Heat Pump, Heat engine and designing Air conditioner. g) In the present state of the art technology, it is of prime importance to use mathematical modeling and software for designing R.A.C equipment	Teaching strategies to be used to develop that knowledge h) Lectures, tutorials and independent study assignments. i) Animations of fundamentals of R.A.C j) Power point presentation on different topic related to this subject. k) Individual assignments require use of library reference material and web sites to identify information required to complete tasks.	Methods of assessment of knowledge acquired a) Home Assignments of 5 points b) Examining the progress through Exam 1 and Exam 2, each of 20 points c) Final assessment of the knowledge through final end term examination of 40 points
1.2			
2.0	Cognitive Skills		
2.1	Description of cognitive skills to be developed • Ability to think critically and analytically • Ability to develop tests in the areas covered at different levels. • Ability to produce test items in areas studied. • Ability to retain information by understanding material • Decrease dependence on memorization	Teaching strategies to be used to develop these cognitive skills • Regularity during lecture classes is essential. • Revising class instructions to keep up to date on the subject is key to learning. • Time Management is always important to be free from burden of the subject. • Joint study sessions amongst students reduce doubts, promotes learning and, competitiveness • Notes must be	Methods of assessment of students cognitive skills • Class participation • Peer/group response • Project • In-term and final

		prepared based on the instructions in class and information given in the book. • Regularly asking questions and clearing the doubts is very important. • Solving the home assignments and worksheets is needed for practice.	
2.2			
3.0	Interpersonal Skills & Responsibility		
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	Methods of assessment of students' interpersonal skills and capacity to carry responsibility Active class participation Home assignments Check the inclinations and interest of the students in the subject area. Performance on midterms and final exams	Teaching strategies to be used to develop these skills Encourage students to consult the specialist in the computer lab for help on web-based material. Purchasing related software within the department Use of PowerPoint when giving presentations in projects Solving problems using related software and numerical method Students will be asked to deliver summary regarding certain topics related to the course. Each student is expected to prepare and present one topic/seminar	Methods of assessment of students numerical and communication skills 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

		regarding the subject.	
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	After the 6th Week	15
2	Second Major Exam	After the 12th Week	15
3	Final Exam	After the 15th Week	40
4	Quiz	Week 5,11	10
5	Homework assignments	Week 4, 6,12	5
6	Lab Exam	After the 12th Week	15

D- Student Academic Counseling and Support

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

1. Weekly office hours
2. Meetings and discussions on Blackboard/D2L

A- Sunday: 08.00 AM to10:50 AM

B- Wednesday: 08.00 AM to 09.50 AM

C- Meeting: Weekly in my office/class room

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 (Journals, Reports, etc.)

NA

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

Scientific journals in the area (give exact titles)

A) As mentioned above

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

Electronic Materials, Web Sites etc

- http://www.springer.com/engineering/mechanical+engineering/journal/231
- http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc
- http://www.faculty.virginia.edu/ribando/modules/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

1- ComSol (Heat transfer, fluid flow, Acoustics, R.A.C…)
2- Thermofluid software springer (Thermofluid)
3- WinTherm heat transfer software

F- Facilities Required

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

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   a- Lecture Rooms
   b- R.A.C lab.

2. Computing resources (AV, projector, Smart board, software, etc.)
   c- Proper projector system

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
Complete Refrigeration has to be setup for better understanding and technical skill.

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
Faculty Peer Assessment
   a- NA

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

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
Samples of student works will be reviewed by another instructor assigned by the department.
   a- Samples of students' assignments and exams are collected every semester and reviewed with faculty members.
   b- Examine students by basic concept questions on subject after completion of semester.
   c- Result of students also reflects the standard of knowledge.
   d- 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.
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.
   e- Feedback mechanisms and evaluations are discussed in meetings with faculty members of mechanical department, and continuous improvement is being implemented.

ME 356

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department: Dept. Mechanical & Industrial engineering	

A. Course Identification and General Information

1. Course title and code: Turbulent flow ME 356
2. Credit hours: 3 (3,1,0)
3. Program(s) in which the course is offered. Bachelor degree: Mechanical Engineering Major
4. Name of faculty member responsible for the course: Iskander Tlili
5. Semester/year at which this course is offered: spring semester, junior year
6. Pre-requisites for this course: ME 353
7. Co-requisites for this course: None
8. Location: main campus
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	√	What percentage?	*100%*
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B. Objectives

1. What is the main purpose for this course? Fundamentals of turbulent flows; the basic equations and the characteristic scales, statistical description of turbulence. Review of experimental results on the statistics and structure of turbulent flows. Methods for calculation of turbulent flows; the problem of closure, semi-empirical, phenomenological and analytical theories of turbulence, large eddy and direct simulations of turbulence.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) - Increased use of IT or web-based reference material

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	0	0	0	60
Credit	45	0	0	0	0	45

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

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	Students will demonstrate basic understanding of the concept of the definition, necessary background and	Lectures, Assignments, at home, Discussions in the Class, Case study	Quizzes: to assess understanding of Turbulent Flows

	importance of the subject of Turbulent Flows, in addition to the ability to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it.	Report (data collection, Internet search, and reporting), Mini project (Design - Hardware / Software Development), Supervised	fundamentals Case Study (Report): to assess technical report writing simulation abilities. Discussion Groups: to assess interactive and communication abilities.
1.2	Understanding statistical description of turbulence, analytical theories of turbulence, calculations concerning turbulent flows.	Collaborative Training, Supervised and video Clips	Midterm Exams: to assess understanding of statistical description of turbulence, analytical theories of turbulence, calculations concerning turbulent flows, problem solving and analytical and design capabilities. Final Exam: to assess understanding of different aspects TF, design capabilities, analytical skills and ability to solve TF problems. Group Mini project: to assess practical hands-on, team work, report writing, ability to deal with laminar and turbulent flow.
2.0	Cognitive Skills		
2.1	Designed to introduce the student to the application of cognitive skills utilizing turbulent flows knowledge in practical project, generate and analyze experimental data.	Lectures, Assignments at home, Discussions in the Class, Case study Report (data collection, Internet search, and reporting) Mini project (Design - Hardware / Software Development), supervised	Quizzes: to assess understanding of turbulent flow fundamentals Case Study (Report): to assess technical report writing simulation abilities. Discussion Groups: to assess interactive and communication abilities.
2.2	Students will gain the ability to write project reports.	Summer Training, Supervised Collaborative Training, Supervised and Video Clips	Midterm Exams: to assess understanding of TF fundamentals, problem solving and analytical and design capabilities. Final Exam: to assess understanding of different aspects in Turbulent flows, design capabilities, analytical skills and ability to

			solve TF problems. Group Mini project: to assess practical hands-on, team work, report writing, ability to deal with Turbulent flow regime.
3.0	Interpersonal Skills & Responsibility		
3.1	Decision making of materials selection for a certain job	Lectures	Quizzes: to assess understanding of TF fundamentals
3.2	Ideas development and sharing with others	Assignments, at home	Case Study (Report): to assess technical report writing simulation abilities.
3.3	Creative thinking	Discussions in the Class	Discussion Groups: to assess interactive and communication abilities.
3.4	Team work	Case study Report (data collection, Internet search, and reporting)	Midterm Exams: to assess understanding of TF fundamentals, problem solving and analytical and design capabilities.
3.5	Problem Solving	Mini project (Design - Hardware / Software Development), Supervised	Final Exam: to assess understanding of different aspects in the TF
		Summer Training, Supervised	
		Collaborative Training, Supervised	
4.0	Communication, Information Technology, Numerical		
4.1	An ability to understand statistical description of turbulence, analytical theories of turbulence, calculations concerning turbulent flows.	Lectures	Quizzes: to assess understanding of TF fundamentals
4.2	An ability to understanding how TF relations are used in evaluation of flow properties.	Assignments, at home	Case Study (Report): to assess technical report writing simulation abilities.
4.3	An ability to understanding TF properties and the fundamentals of governing equation and to learn how to apply the fundamentals of conservation of mass and energy in design and analysis of TF regime systems.	Discussions in the Class	Discussion Groups: to assess interactive and communication abilities.
4.4	An ability to understand the TF analysis	Case study Report (data collection, Internet search, and reporting)	Midterm Exams: to assess understanding of TF fundamentals, problem solving and analytical and design capabilities.

		Mini project (Design - Hardware / Software Development), Supervised	Final Exam: to assess understanding of different aspects in the TF regime.
		Summer Training, Supervised	Group Mini project: to assess practical hands-on, team work, report writing, ability to deal with different flow regime.
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	Week 7 or 8	20
2	Second Major Exam	Week 14 or 15	20
3	Final Exam	Final exam week	40
4	Quiz		10
5	Homework assignments		10

D. Student Academic Counseling and Support

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

3. Weekly office hours
4. Meetings and discussions on Blackboard/D2L

E. Learning Resources

1. List Required Textbooks
Turbulent Flows, S. B. Pope, Cambridge University Press. Edition 2008.

2. List Essential References Materials (Journals, Reports, etc.)
An Introduction to Turbulent Flow, Jean Mathieu, Julian Scott, Cambridge University Press (June 26, 2000)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Scientific journals in the area (give exact titles)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
http://ocw.mit.edu/courses/mechanical-engineering/2-27-turbulent-flow-and-transport-spring-2002/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Flow software (Fluent, ANSYS…)

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) 1. Classroom

2. Computing resources (AV, projector, Smart board, software, etc.) Computer lab
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) a- TF software b- ANSYS software

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 357

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department Dept. Mechanical & Industrial engineering	

A. Course Identification and General Information

1. Course title and code: Membrane desalination processes ME 357			
2. Credit hours: 2 (2,1,0)			
3. Program(s) in which the course is offered. Bachelor degree: Mechanical Engineering Program			
4. Name of faculty member responsible for the course: Iskander Tlili			
5. Semester/year at which this course is offered: spring semester, junior year			
6. Pre-requisites for this course: NA			
7. Co-requisites for this course: ME 354			
8. Location: main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	√	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B. Objectives

1. What is the main purpose for this course? Intake, pumping, Filtration, ion exchange, pretreatment, Membranes, Membrane technology, Reverse Osmosis systems (RO) principles, system design, RO membranes characteristics. Electrodialysis (ED), Other membrane processes, introduction to fouling, Computer applications
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) . At undergraduate level of engineering the content of the course fits the requirement of the branch. However, field visit are needed to make information and forms easily accessible to students.

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	0	45
Credit	30	0	0	0	0	30

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

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	• Teaching strategies to be used to develop that knowledge	First major exam: 20 Points Second major exam: 20 Points Final exam: 40 Points

	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.	Home assignments & Quiz: 20 Points. Total 100 Points
2.0	Cognitive Skills		
2.1	The basic mental skills to be targeted include • Relaxation and self-talk, • Imagery & 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	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. A- Promoting and shaping projects originating from students' mind. B- Organizing students'

		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.	seminars where the topics already taught can be used by the students to deliver a lecture. C- Planning surveys of various types to gather subject information in an organized statistical form and giving self-analysis based on the data collected. D- Deputing students on each individual test/experimental setup for its running and up keep. E- Developing simple demonstration equipment to show simple concepts of the subject and also for use in the laboratory or elsewhere. F- Article writing or even book writing can be one of the areas to explore. G- 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.
3.0	Interpersonal Skills & Responsibility		
3.1	a-Students can complete all assignments in due time b- Students can participate in class discussion and think critically c-Students can act responsibly and ethically in carrying out individual as well as group projects d- Students have the necessary skills to communicate, listen, negotiate, and evaluate	1. Lectures in which students are made aware of the significance of time management. 2. Discussions with students on ethical behaviour in conducting project or research. 3. Individual counselling on research projects and subject matter difficulties. 4. Group assignments where much of the most effective learning comes from the student explaining, discussing	1. Active class participation reflects the students ability to keep up with the concealed math ideas 2. Homework assignments will attest to the student's ability to fulfil required tasks and respect deadlines 3. Performance on midterms and final exams are evidence of the

	their strengths and weaknesses as members of a team e- Students have the necessary skills to defend their points of view and/or proposed solution to any problem based on the acquired knowledge. f- Students have the necessary skills to evaluate peers' answers and solutions, point and correct their mistakes	and defending her own ideas with her peers. 5. 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. 6. 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. 7. Students have to figure out what his learning style is, and fit his study approaches to that style. 8. Students are expected to develop certain teamwork activities regarding the theoretical part.	student's ability to recollect and synthesize information. 4. Instructor's assessment of student's performance and seriousness during individual practice hours
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	A. Use of Mathematical package and such MD software. B. Use of the Internet. C. Use of PowerPoint and laptop – projector systems. D. 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.	a. Some marks for the use of web-based material in students' presentations. b. Distribute some marks in every assigned project so students know what they will be evaluated on c. Set marks for the PowerPoint presentation students create to give their presentations, its content and their presentation skills. d. Set marks in doing lots of solving problems using software.
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		
2	Second Major Exam		
3	Final Exam	Final exam week	40
4	Quiz		
5	Homework assignments		

D. Student Academic Counseling and Support

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

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

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.2010.

2. List Essential References Materials (Journals, Reports, etc.)
Fundamentals of Salt Water Desalination H.T. El-Dessouky & H.M. Ettouney, Elsevier 2002.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Scientific journals in the area (give exact titles)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
http://www.sustainable-desalination.net/courses/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- Desalination software
- Matlab.

F. Facilities Required

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

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   A. Classroom

2. Computing resources (AV, projector, Smart board, software, etc.)

Computer lab

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- Desalination software
- Matlab.

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 a- Plan: The instructor will develop a strategy for teaching. b- Do: The strategy will be implemented for one semester. c- Study: The experiences of the students will be collected through a survey. d- Act: Effective teaching strategies will be implemented and revised as more experiences are gained.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 415

Course Specifications

Institution: Majmaah University	Date of Report: 26/01/2015
College/Department: Mechanical and Industrial Engineering	

A. Course Identification and General Information

1. Course title and code: Computer aided Manufacturing ME 415
2. Credit hours: 03 (2,1,2)
3. Program(s) in which the course is offered. Mechanical Engineering Major
4. Name of faculty member responsible for the course: Dr Subhash Chandra
5. Semester/year at which this course is offered: spring semester, senior year
6. Pre-requisites for this course: ME 212, ME 424
7. Co-requisites for this course:
8. Location: main campus
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	√	What percentage?	84
b. Blended (traditional and online)	√	What percentage?	6
c. e-learning	√	What percentage?	10
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments: The course involves CNC part programming, use of part drawing for dimensional analysis, and simulation using TOP CAM software.

B. Objectives

2. What is the main purpose for this course? (This part must come from the main document of the curriculum) Course provides the knowledge in the emerging area of computer aided manufacturing covering the topics concerning: automation strategies, Job shop, flow shop, Automated flow lines, Flow line balancing, production economies, knowledge of CNC lathe and milling machines, part programming, automatic inspection, Industrial robots, Material handling, storage, Group technology required for cellular manufacturing and Flexible Manufacturing System.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department) It is complete in its present contents. The annual maintenance of machines and upgrading the same by the suppliers may be done periodically.

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Automation strategies. Automation Strategies, production concepts and, types of production, types of automation,	2	7
Mathematical models, sequencing of jobs, Flow lines	2	6
Production economics. Cost in manufacturing, factory overheads, capital investment, present worth method, High volume production systems, cost of equipment usage	2	6
Numerical control production: NC part programming. DNC, CNC, and adaptive control.	2	6
Industrial robots. Material handling and storage.	2	5
Group Technology: Group technology and flexible manufacturing.	1	3
Quality control and automated inspection. Control systems.	1	2
Computer algorithms for linear interpolation, rotation, scaling and translation.	1	2
Programmable controllers. Computer networks.	1	2

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	15	30			75
Credit	03					

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		
1.1	(i) Description of the knowledge to be acquired a- Learn about production scheduling and planning for job shop, flow shop and flow lines b- Cost of unit production in high volume production, and assembly lines c- How transfer mechanisms, material handling systems, and industrial robots are used? d- Part programming for CNC lathe and CNC mill, simulation of CNC machining. e- Practically coding the part program and execute to see working f- Formation of part and machine families for FMS using Group technology g- Hands on practice sessions to learn the subject by doing	(i) Teaching strategies to be used to develop that knowledge a- Emphasis on hand on practice based learning Examples of real life problems are discussed to create interest, students are involved in the process to participate simultaneously. b- The concepts are applied in practical life thus orientation of teaching is correlating theory with practical world. c- Interactive learning with real time feedback, and learning through practice d- Assignment to solve problems at home	Methods of assessment of knowledge acquired e-Checking their knowledge during simulation and practice classes on regular basis f- Asking the students to attempt the problem independently to make them confident and assuring the gain of knowledge through timely feedback and correcting the lapses. g- Assignments to think and refresh the concepts and solve the problems independently. h- There are tests after completion of some topics, and quizzes to check their knowledge and give feedback for deficiency
1.2			
2.0	Cognitive Skills		
2.1	i) Description of cognitive skills to be developed A- Involving students during teaching learning process. A great deal of practice-oriented learning is valued. The students are subjected to recall the concepts. They first assimilate the knowledge in bits and pieces to recall later. B- Practicing the concepts step by step C- Recapitulating in the beginning of class and asking students to	(i) Teaching strategies to be used to develop these cognitive skills • Allowing students to think to solve the problems in groups to exchange their thought and reinforce the same. Students should learn what is taught rather just noting what is written on board. So making room for students to	(i) Methods of assessment of students cognitive skills • Continuous evaluation or assessment requires them to keep revising the concepts frequently. • Giving assignments to refresh the concepts

	recall the contents of previous class D- Involving students to solve open-ended type of problem step by step.	be creative and self styled. • Allowing the students to solve problems during exercise/tutorial with interactive guidance to boost their morale and interest. • At the end of chapter asking them the key areas and main topics to recall them • Asking them the formulas, equations used and how can they apply the knowledge for a specific type of problem	periodically to raise retention period of cognitive learning • Tests and quizzes are arranged periodically so that they keep learning throughout
2.2			
3.0	Interpersonal Skills & Responsibility		
3.1	(i) Description of the interpersonal skills and capacity to carry responsibility to be developed • Allocating group based assignments, giving challenging problems to share with classmates and teacher in applying concepts. This will enhance the interpersonal interactive skill and being accountable for their role.	(ii) Teaching strategies to be used to develop these skills and abilities • Getting students involved to solve problems. Explain the concept till it is clear to them, explain through different perspectives.	(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility • Through class room interaction mainly.
3.2	• How teams can be organized to solve a problem in group, how to coordinate the responsibility, how to monitor the progress, till completion of task. Trust building and cooperation will depend upon the level of communication the students maintain among themselves.	• Encouraging individuals creativity to up bring to next level from present level	• Observing the attentiveness during brainstorming session, lab demonstration and defending project work
4.0	Communication, Information Technology, Numerical		
4.1	(i) Description of the skills to be developed in this domain. • Mathematical skills • Problem solving skill • Skills to use CNC machines • Product designing skills	(ii) Teaching strategies to be used to develop these skills • Through hands on practice and exercise	(iii) Methods of assessment of students numerical and communication skills • Question answer session 1. Making students to exercise hands on experience during tutorial period

			2. Working on CNC machines
4.2	A- Computer and simulation skills	a- Encouragement of independent self study with guidance	b- Questions are relevant to real life, How these analysis can be used in decision making through out the profession. Self appraisal to overcome the deficiency
5.0	Psychomotor		
5.1	NA		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	6	20
2	Second Major Exam	11	20
3	Final Exam	Final exam week	40
4	Quiz	4	10
5	Homework assignments	9	10

D. Student Academic Counseling and Support

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

1. Weekly office hours
2. Meetings and discussions on Blackboard/D2L

E. Learning Resources

1. List Required Textbooks
Mikell P. Groover, and Emory W. Zimmers, Jr., "CAD/CAM: Computer-Aided Design and Manufacturing," Prentice Hall, Inc. 1990.

2. List Essential References Materials (Journals, Reports, etc.)
Sundar, Computer aided manufacturing, LaxmiPublications, 2013.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
Books are available on SDL and net to download and read

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

CAM TOP Simulation software, auto CAD 10 are used for part drawing and part programming

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) 1. Classroom 2. Computer laboratory available

2. Computing resources (AV, projector, Smart board, software, etc.) Available
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) 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 • 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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 428

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department: Mechanical & Industrial Engineering	

A. Course Identification and General Information

1. Course title and code: Tribology ME 428			
2. Credit hours: 3 (2,1,2)			
3. Program(s) in which the course is offered. Bachelor degree in Mechanical Engineering			
4. Name of faculty member responsible for the course:			
5. Semester/year at which this course is offered: elective course			
6. Pre-requisites for this course: ME 323 and ME 212			
7. Co-requisites for this course: NA			
8. Location: main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	x	What percentage?	100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	
Comments:			

B. Objectives

1. What is the main purpose for this course? (This part must come from the main document of the curriculum)

An understanding of the definition, necessary background and importance of the subject of Tribology, in addition to the ability to apply the breadth and depth of this subject including the basic terminology, concepts, principles and theories of it in order to:

- Gain an understanding of the theory and practice of: Friction, Wear, and Lubrication
- To be able to select materials for tribological applications.
- Learn about emerging area such as micro-nano tribology.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) (This part must be approved by the department)

a. Increased use of IT or web-based reference material and videos
b. 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
Introduction: Applications, significance	1	3
Nature of solid surfaces: Surface Characterization	2	6
Contact of Solid Surfaces: Elastic Contact (Hertizian Theory) Normal Single Asperity Contact	2	6
Friction: Tribometers, The Laws of Friction, Basic Mechanisms of Sliding Friction, Rolling Friction, Friction of Metals and Alloys	2	6
Wear and Wear Mechanisms: Types of wear, Quantitative Laws of Wear, Erosion, Types of erosion	3	9
Lubrication: Function of a lubricant, Types of Lubricant, Lubricating Oils, Regimes of Lubrication, Base-oil properties, Additives, Grease	3	9

2. Course components (total contact hours and credits per semester): 26

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	26	12	20			58
Credit	26	--	10			36

3. Additional private study/learning hours expected for students per week. 5

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 understanding surface topography and know how to model a rough engineering surface; • Have a clear overall picture about the basics of tribology and related sciences, theoretical background about processes in tribological system, mechanisms and forms of interaction of friction surfaces; • Understand Hertz contact and rough surface contact; • Be familiar with adhesion theories and the effect of adhesion on friction and wear; • Have a mastery of the friction/lubrication mechanisms and know how to apply them to the practical engineering problem; • Know the methods to reduce the friction for engineering surface	• Problems solving – Sample problems and exercise problems, • Assignment problems for applications. • Lab (perform erosion experiments) • Web – based materials	Attendance of lectures, labs, and tutorials is a most. Homework assignments
1.2			
2.0	Cognitive Skills		
2.1	• Analysis & decomposition associated with engineering design & manufacture • Application and analysis of the limitations and context of engineering principles • Skill of communicating in Teams	• Lectures are followed by numerous examples, some of which are practical in nature, to illustrate the application theories • Tutorials are used to explain further the theories and to help the students to apply them in solving problems • Engage students in Guiding Students in their labs and assignments	• Class participation • Formal tests • Homework assignments
2.2			

3.0	Interpersonal Skills & Responsibility		
3.1	• Work in groups and independently • Manage resources, time and other members of the group • Communicate results of work to others • Help students to solve the problem by asking questions during the office hour.	• Solve the problems by asking sequential questions, • Work in groups for solving certain problems.	• Homework discussion and evaluation, • Assessing communicative skills.
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	• Use of Internet. • Use of PowerPoint and laptop – projector systems. • Use of the advanced features in scientific calculators	Incorporating the use and utilization of computer in the course requirements (electronic copy of the textbook was distributed).	Discussion, Questioning during topics
4.2			
5.0	Psychomotor		
5.1	NA		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam	Within the sixth week	20
2	Second Major Exam	Within the twelfth week	20
3	Final Exam	Final exam week	40
4	Quiz	Before major exams	10
5	Homework assignments	At end of each topic	10

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) 3. Weekly office hours 4. Meetings and discussions on Blackboard/D2L

E. Learning Resources

1. List Required Textbooks Fundamental of tribology, R. Gohar, Imperial College Press, 2008
2. List Essential References Materials (Journals, Reports, etc.) • N/A
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Engineering Tribology, J. Williams, Cambridge University Press,2005

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) Lecture material in PPT
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. N/A

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Classroom Lecture room equipped with blackboard, data show, computer, and internet

2. Computing resources (AV, projector, Smart board, software, etc.) a. Laptop b. projector system
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • N/A

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • Providing samples of all kind of assessment in the departmental course collection of each course, • Conducting standard exams, • Independent checking of End-Semester assessment,

- Checking of course files by the Quality Centre Nominee and give suggestions for improvement in writing.

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.

- Review of Course files,
- Student feedback at end of the semester,
- Feedback of the assessment at the beginning of the next semester,
- Workshop at the beginning of the next semester on improvements suggested.

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.

ME 459

Course Specifications

Institution: Majmaah University	Date of Report March 19, 2015
College/Department: Dept. Mechanical & Industrial engineering	

A. Course Identification and General Information

1. Course title and code: Internal Combustion Engines ME 459
2. Credit hours: 3 (3,1,0)
3. Program(s) in which the course is offered. Bachelor degree: Mechanical Engineering Major
4. Name of faculty member responsible for the course: Iskander Tlili
5. Semester/year at which this course is offered: fall semester, senior year
6. Pre-requisites for this course: ME 252
7. Co-requisites for this course: None
8. Location: main campus
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	√	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B. Objectives

1. What is the main purpose for this course? Spark ignition and compression ignition engine types, design and operating parameters; thermo chemistry of fuel-air mixture and thermodynamic models of working fluids and engine cycles. Gas exchange processes and volumetric efficiency. Carburetors and electronic fuel injection. Performance parameters. Combustion chamber design, and octane number. Diesel fuel injection, supercharging of 4-stroke and 2-stroke S.I. and C.I. engines.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

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.	1	3
Design features and operating characteristics of different types of internal combustion engines: spark-ignition, diesel.	2-4	9
Combustion chamber design, and octane number.	5	3
Performance parameters. The fundamentals of how the design and operation of internal combustion engines affect their performance, operation, fuel requirements.	6-8	9
Gas exchange processes and volumetric efficiency	9-10	6
Carburetors and electronic fuel injection, Diesel fuel injection	11-12	6
Thermo chemistry of fuel-air mixture and thermodynamic models of working fluids and engine cycles.	13-14	6
Supercharging of 4-stroke and 2-stroke S.I. and C.I. engines.	15	3

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	45	0	0	0	0	45

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

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

	NQF Learning Domains	Course Teaching	Course Assessment

	And Course Learning Outcomes	Strategies	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	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.	First Major Exam: 20 Points Second Major Exam: 20 Points Final Exam: 40 Points Home assignments & Quiz: 20 Points Total 100 Points
2.0	Cognitive Skills		
2.1	The basic mental skills to be targeted include • Relaxation and self-talk, • Imagery & Mental rehearsal, • Concentration, Goal-setting.	a- 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. b- Converting Information to a Conceptual Belief: Any information received is just useless until it becomes a belief. Our brain receives 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. c- 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	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

		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. d- 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	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 helped me to develop my own self too along with the students
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	• Lectures in which students are made aware of the significance of time management • Discussions with students on ethical behavior in conducting research • Individual counseling 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	5. Active class participation reflects the students ability to keep up with the concealed math ideas 6. Homework assignments will attest to the student's ability to fulfill required tasks and respect deadlines 7. Performance on midterms and final exams are evidence of the student's ability to recollect and synthesize information. 8. Instructor's assessment of student's performance and seriousness during individual practice hours

	peers' answers and solutions, point and correct their mistakes	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.	
4.0	Communication, Information Technology, Numerical		
4.1	E. Use of Mathematical package and such IC Engine software. F. Use of Internet. G. Use of PowerPoint and laptop – projector systems. H. Use of the advanced features in scientific calculators.	I. Encourage students to consult the specialist in the computer lab for help on web-based material J. Demand the use of PowerPoint when giving presentations in projects K. Solving lots of problems using software. L. Students will be asked to deliver summary regarding certain topics related to the course. M. Students will be asked to prepare and present subjects using different educational strategies (power point presentation, projections…) N. Each student is expected to prepare and present one issue regarding to the course.	e. Some marks for the use of web-based material in students' presentations. f. Distribute some marks in every assigned project so students know what they will be evaluated on g. Set marks for the PowerPoint presentation students create to give their presentations, its content and their presentation skills. h. Set marks in doing lots of solving problems using software.
5.0	Psychomotor		
5.1	(NA)		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	First Major Exam		
2	Second Major Exam		
3	Final Exam	Final exam week	40
4	Quiz		
5	Homework assignments		

D. Student Academic Counseling and Support

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

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

E. Learning Resources

1. List Required Textbooks Internal Combustion Engines, V. Ganesan, Tata McGraw-Hill, 2012.
2. List Essential References Materials (Journals, Reports, etc.) Internal Combustion Engines Fundamentals by J.B. Heywood, McGraw Hill 2012
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) None
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. • MS Excel • IC Engine software

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) a- Classroom

2. Computing resources (AV, projector, Smart board, software, etc.) a- Computer lab
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) a- MS Excel b- IC Engine software

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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.

ME 460

Course Specifications

Institution: Majmaah University	Date of Report: 14/01/2015
College/Department : College of Engineering/ Department of Mechanical Engineering	

A. Course Identification and General Information

1. Course title and code: Power Plants ME 460
2. Credit hours: 3
3. Program(s) in which the course is offered. Bachelor degree in Mechanical Engineering
4. Name of faculty member responsible for the course: Dr. Mohammad Nadeem Khan
5. Semester/year at which this course is offered: spring semester, senior year
6. Pre-requisites for this course: ME 354
7. Co-requisites for this course: Nil
8. Location: Main Building of the College
9. Mode of Instruction

a. Traditional classroom	√	What percentage?	80
b. Blended (traditional and online)		What percentage?	
c. e-learning	√	What percentage?	20
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

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

B. Objectives

1. What is the main purpose for this course?
1- Describe sources of energy and types of power plants 2- Analyze different types of steam cycles and estimate efficiencies in a steam power plant 3- Describe basic working principles of gas turbine and diesel engine power plants. Define the performance characteristics and components of such power plants 4- List different types of fuels used in power plants and estimate their heating values
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) 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
Introduction	1	3
Analysis of Steam Cycles	3	9
Basic and auxiliary systems of a steam p.p.	2	6
Steam generator analysis.	1	3
Steam turbines and their controls.	1	3
Analysis of Gas Turbine Cycle power plant	3	9
Analysis of Diesel Cycles power plant	2	6
Fuels and combustion.	1	3
Economic of power plant	1	3
Total	15	45

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	A- 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 B- 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 quizzes
3.0	Interpersonal Skills & Responsibility		
3.1	a- Punctual attendance of classes and tutorials b- Student will take the responsibility to solve given assignments on their own and submit the solution on time. c- Students learn to manage their time in self-study of the course engineering technology.	1. 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. 2. Participation of students in classroom discussion.	1. Class attendance of students at the beginning of the lecture is recoded. 2. 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	7th week	20
2	Second Major Exam	13th week	20
3	Final Exam	Final exam week	40
4	Quiz	14th week	10
5	Homework assignments	Weekly	10

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) 1. Weekly office hours 2. Meetings and discussions on Blackboard/D2L

E. Learning Resources

1. List Required Textbooks Power plant engineering by P.K.. Nag, Tata-McGraw Hill. Higher Education
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Power plant Technology, by M.M. EL-Wakil, McGraw Hill
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) A- Classroom B- Board/Marker

2. Computing resources (AV, projector, Smart board, software, etc.) a. Laptop b. Projector
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 (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 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.