KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

ENGINEERING MECHANICS: STATIC AND DYNAMICS COURSE SYLLABUS			
Course Title	**Engineering Mechanics: Statics and Dynamics**		
Course Code	**MEE2405**	**No. of Credits**	**4 CH**
Department	**CVE, ENV & PTE**	**College**	**Engineering**
Pre-requisites Course Code	**General Physics I and Lab PHY1410C**	**Co-requisites Course Code**	**N/A**
Course Coordinator(s)	**Dr. Diyar I. Ahmed**		
Email	**diyar.ahmed@komar.edu.iq**	**IP No.**	
Other Course Teacher(s)/Tutor(s)	**N/A**	**Google Classroom Code**	**njf599n**
Learning Hours	**Section 1: Monday/Wednesday 10:00 A.M. - 12:00 P.M. Room No. 111** **Section 2: Monday/ Wednesday 14:00 P.M. - 16:00 P.M. Room No. 113**		
Contact Hours	**Sunday/Thursday from 10:00 A.M. to 12:00 P.M., Room No. 212**		
Class Website	**https://classroom.google.com/u/0/c/OTI5NDU3ODVa** The Google Classroom website will be used to post homework assignments, announcements, additional instructional material, etc.		
Course Type	**College Requirement**		
Offer in Academic Year	**Spring/2016**		

COURSE DESCRIPTION

This course includes the elements of static in co-planar and three-dimensional systems; equilibrium of particles and rigid bodies; simple structures; centroids and center of gravity; beam shear and bending moment and virtual work. Analyzes kinematics and kinetics of particles, systems of particles, and rigid bodies. Discusses absolute and relative motion approaches. Employs force-mass acceleration, work-energy and impulse-momentum methods.

COURSE OBJECTIVES

Develop an understanding of the principles of statics and dynamics, and the ability to analyze problem in a systematic and logical manner including the ability to draw free-body diagrams. Ability to analyze the statics of trusses, frames and machine and the dynamics of particles, systems of particles and rigid bodies.

KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

COURSE LEARNING OUTCOMES

After participating in the course, students would be able to:

1. Define the magnitude and directions of forces and moments and identify associated scale and vector products, [ABET Program Outcome, **a,** and **e**].
2. Sketch free body diagrams for two-and-three-dimensional force systems, [ABET Program Outcome, **a,** and **e**].
3. Solve simple problems using the equations of static equilibrium, [ABET Program Outcome, **a,** and **e**].
4. Estimate the forces and couples acting on a variety of objects, [ABET Program Outcome, **a,** and **e**].
5. Explain the structure of trusses, centroids and moment of inertia, [ABET Program Outcome, **a,** and **e**].
6. Recognize kinematic and kinetic analysis using forces and acceleration and work and energy for particles and systems of particles, [ABET Program Outcome, **a,** and **e**].

Grading Scale:

Points	Percentage Scores
A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	75-79
C	70-74
C-	65-69
D+	60-64
D	55-59
D-	50-54
F	0-49
W	Withdrawal
I	Incomplete

Note: The minimum passing grade to pass this course is **C-** which is equivalent to **65%.**

COURSE TEACHING AND LEARNING ACTIVITIES (short description)

This course will be carried out in **4 hours**, **2 times** lecture per week. The semester has 15-instructional weeks followed by one week of exam. Course instructor will:

- Utilize power point presentation to present the course information.
- The board space to solve problems with students.
  There will be in class group work, where student will do in class exercises and turn the assignment to the instructor.

Note: Pop quiz might be given unexpectedly during the lectures.

COURSE ASSESSMENT TOOLS

Assessment Method	Description	Weight
Quizzes	Quizzes are scheduled as shown in the semester schedule. Students will take minimum 4 quizzes; all quiz grades will be counted toward your final grade.	**20 %**
Assignments/Group Discussions	Students will be evaluated by the instructor based on the assigned tasks and solving problems arising in the class.	**10 %**
Mid-Term Exam	The mid-term exam will be conducted after week 7 of the semester. It will cover the first half of the course contents.	**20 %**
Test	This Test will be conducted after week 12 of the semester. It will cover part of the second half of the course contents.	**20 %**
Final Exam	The final exam will be designed to cover all the students' learning outcomes for this course, the exam will be closed book.	**30 %**
Total		**100%**

 Note: Passing Grade is **65 %** and above

ESSENTIAL READINGS: (Textbooks)

Textbook:
Title: Engineering Mechanics: Static and Dynamics
Author: Hibbeler
Publisher: Prentice Hall; 13th edition, 2013
ISBN-13: 978-981-06-8134-0
ISBN-10: 981-06-8134-8

References:
Title: Schaum's Outline of Engineering Mechanics: Static (Schaum's Outline Series)
Author: Nelson, Best, Mclean, Potter
Publisher: McGraw-Hill; 6th edition (2010)
ISBN-10: 0071632379
ISBN:-13: 978-007163279

Title: Vector Mechanics for Engineers: Statics and Dynamics
Author: Eisenberg, Beer, E. Russell, Johnston, Mazurek, Clausen
Publisher: McGraw-Hill Higher Education
ISBN-10: 0073212229
ISBN-13: 978-0073212227

TEACHING PHILOSOPHY

The successful completion of this course requires your **attention, hard work, and respect**. In return, I will strive to create a classroom setting that encourages **learning, critical thinking, and respect** for all students. I will endeavor to meet your academic needs, and as such encourage all students to take advantage of the weekly office hours. I enjoy helping students outside of the classroom. However, please be respectful of my time, as I have other duties to perform within the department. **This course will be CHALLENGING**, but your hard work will be rewarded by positive feedback, representative grades, and better understanding of the mechanical and dynamic world and necessary preparation for future courses.

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Attendance Policy:
Students are expected to attend each class for the entire semester. Students are responsible for material presented in lectures. Attendance is taken at the end of each class. Only students with official KUST absences, family crises, and illness are excused from class. This in no way cancels any responsibility for work due or assigned during absence. **Three occasions of lateness count as one absence. The student who misses more than 10 percent of the course classes will be expelled.**

Make-up Policy:
Because all examinations are announced in advance a zero will be assigned to any missed examination unless a student has a legitimate acceptable reason, such as illness, for not being able to take the examination during all the days when the examination was announced.

Academic Dishonesty:
Any type of dishonesty (plagiarism, copying another's test or home-work, etc) will NOT be tolerated. Students found guilty of any type of academic dishonesty are subject to failure in this course, plus further punishment by the University Consul.

Deadlines/Due Dates:
Recognizing that a large part of professional life is meeting deadlines, it is necessary to develop time management and organizational skills. Failure to meet the course deadlines will result in penalties. Work may be submitted early.

GUIDELINES FOR SUCCESS

Contacting Hours:
You must communicate with your instructor during the class time and office hours. **DO NOT** come to my office unless there is an emergency.

Classroom Etiquette:
There is one basic rule in this lass and that is: Respect yourself, your peers and the instructor.

How can you follow this rule?!
1. Be on time to class, so as not to disturb your colleagues or the instructor.
2. Do not partake. It is distracting activities during the lecture, such as talking to your friend or using a cellphone.
3. Respect the questions being asked by your peers.

Succeeding in Class:
1. Be on time and be prepared.
2. Be an active participant in class. **ASK QUESTION**.
3. Do not miss class. Your performance is correlated to your attendance.
4. Learn to think and understand NOT to memorize concepts.
5. Spend 2-3 hours doing homework, practice questions and reading the text for every hour spent in lecture. **FOR A 4 CREDIT HOURS COURSE, YOU SHOULD BE SPENDING 8-12 HOURS A WEEK STUDYING.**

KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

E-MAIL ETIQUETTEOF COMMUNICATION
Please note the following in regards to e-mail communication: 1. It is your responsibility to update your Komar-email address daily for course updates. Instructor will not be able to contact you if you fail to have an email address and you could potentially miss important information about the course. 2. Email will only be answered if it comes from Komar-email address. Faculty will not respond to unprofessional email addresses. 3. Mail should have a subject heading which reflects the content of the message. 4. Your message should begin with an appropriate salutation, including the name of the person being addressed, and end with thanks followed by your full name of the sender. 5. Emails that do not follow the above guidelines, or are written in an unprofessional and / or disrespectful manner as well as anonymous emails will not be addressed. 6. Failure to check e-mail or moodle may result in you missing important assignments and subsequently affect your grade.

Course Outline
Spring Semester 2015/2016

Date	Week	Subject	Activities
Feb 28, 2016	1	**CHAPTER 1: INTRODUCTION AND GENERAL PRINCIPLES** **1.1:** Mechanics **1.2:** Fundamental Concepts **1.3:** Units of Measurements **1.4:** The International System of Units **1.5:** Numerical Calculations **1.6:** General Procedures for Analysis	Syllabus Agreement
March 6, 2016	2	**CHAPTER 2: FORCE VECTOR** **2.1:** Scalars and Vectors **2.2:** Vector Operations **2.3:** Vector Addition of Forces **2.4:** Addition of a System of Coplanar Forces	Reading Quiz #1
March 13, 2016	3	**CHAPTER 3: EQUILIBRIUM OF A PARTICLE** **3.1:** Condition for the Equilibrium of a Particle **3.2:** The Free Body Diagram **3.3:** Coplanar Force Systems **3.4:** Three-Dimensional Force Systems	Quiz #1
March 27, 2016	4	**CHAPTER 4: FORCE SYSTEM RESULTANT** **4.1:** Moment of a Force-Scalar Formulation **4.4:** Principle of Moments **4.6:** Moment of Couple **4.7:** Simplification of a Force and Couple System **4.8:** Further Simplification of a Force and Couple System **4.9:** Reduction of a Simple Distributed Loading	Reading Quiz #2
April 3, 2016	5	**CHAPTER 4: CONTINUED**	Quiz #2

KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Date	Week	Subject	Activities
April 10, 2016	6	**CHAPTER 5: EQUILIBRIUM OF A RIGID BODY** **5.1:** Conditions for Rigid-Body Equilibrium **5.2:** Free-Body Diagrams **5.3:** Equations of Equilibrium	
April 17, 2016	7	**CHAPTER 5: EQUILIBRIUM OF A RIGID BODY (CONTINUED)**	Reading Quiz #3
April 22, 2016		**MIDTERM TEST: CHAPTERS 1, 2, 3, 4 & 5**	
May 2, 2016	8	**CHAPTER 6: STRUCTURAL ANALYSIS** **6.1:** Simple Truss **6.2:** The Method of Joints **6.3:** Zero-Force Members **6.4:** The Method of Section	Reading Quiz #4
May 8, 2016	9	**CHAPTER 6: STRUCTURAL ANALYSIS (CONTINUED)**	Quiz #3
May 15, 2016	10	**CHAPTER 7: INTERNAL FORCES** **7.1:** Internal Loadings Developed in Structural Members **7.2:** Shear and Moment Equations and Diagrams	
May 22, 2016	11	**CHAPTER 9: CENTER OF GRAVITY AND CENTROID** **9.2:** Composite Bodies	
May 29, 2016	12	**CHAPTER 10:MOMENTS OF INERTIA** **10.1:** Definition of Moments of Inertia for Areas **10.2:** Parallel-Axis Theorem for an Area **10.4:** Moments of Inertia for Composite Areas	
		TEST: CHAPTERS 6, 7, 9 & 10	
June 5, 2016	13	**CHAPTER 13:KINETICS OF A PARTICLE: FORCE AND ACCELERATION** **13.1:** Newton's Second Law of Motion **13.2:** The Equation of Motion **13.4:** Equations of Motion: Rectangular Coordinates	
June 12, 2016	14	**CHAPTER 14:KINETICS OF A PARTICLE: WORK AND ENERGY** **14.1:** The Work of a Force **14.2:** Principle of Work and Energy **14.3:** Principle of Work and Energy for a System of Particles	Quiz #4
June 19, 2016	15	**REVIEW AND MAKE UP**	
June 24, 2016		**FINAL EXAM WEEK (NO CLASSES)**	

*THIS SYLLABUS IS SUBJECTED TO CHANGES