ECTS COURSE INFORMATION FORM

Faculty	**Faculty of Engineering**	
Program	**B.Sc. in Civil Engineering**	**Required**
	B.Sc. in Computer Engineering	**Elective**
	B.Sc. in Electrical-Electronics Engineering	**Elective**
	B.Sc. in Industrial Engineering	**Elective**
	B.Sc. in Mechanical Engineering	**Required**

Course Code	STAT 102			
Course Title in English	Engineering Mechanics: Statics			
Course Title in Turkish	Mühendislik Mekaniği: Statik			
Language of Instruction	English			
Type of Course	Flipped Classroom			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science	Basic Engineering	Engineering Design	General Education
		100	**-**	-
Semester Offered	Spring			
Contact Hours per Week	Lecture: 3 hours	Recitation: -	Lab: -	Other: -
Estimated Student Workload	157 hours			
Number of Credits	6 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	None			
Expected Prior Knowledge	None			
Co-requisites	None			
Registration Restrictions	Only Undergraduate Students			
Overall Educational Objective	To acquire a basic knowledge and understanding of important concepts of static equilibrium conditions of a particle and rigid body, free body diagrams, friction and center of gravity of the rigid bodies			
Course Description	This course provides a comprehensive introduction to some fundamental aspects of vector quantities, forces and moments, static equilibrium conditions of a particle and rigid body, free body diagrams, structural analysis of beams, frames and trusses, internal forces, distributed loads, shear force and bending moment diagrams of beams, friction, center of gravity, centroid and moments of inertia of composite bodies.			
Course Description in Turkish	Bu derste; statik'in temel kavramları şu konu başlıklar altında kapsamlı bir şekilde incelenmektedir: Serbest cisim diyagramları, vektörel büyüklükler, kuvvet ve moment, denge denklemleri, yapısal analiz, kafes sistemleri, çubuklar ve çerçeveler, iç kuvvetler, kesme kuvveti ve eğilme momenti diyagramları, yayılı kuvvetler, sürtünme, ağırlık merkezi, geometrik merkez ve bileşik alanların atalet momenti.			
Course Learning Outcomes and Competences	Upon successful completion of the course, the learner is expected to: 1. apply static equilibrium conditions of a particle and rigid body; including vector formulation for three-dimensional problems. Draw free body diagrams. Solve reaction forces in beams and frames under concentrated loads, moments and distributed loads; 2. apply method of joints and method of sections to determine forces in members of planar trusses; 3. compute internal forces and moments in structures; draw shear force and bending moment diagrams of the beams; 4. apply friction laws to structures and belts; 5. compute center of gravity, centroid and moment of inertia of a body and composite bodies.			

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1,2,3,4,5	Exams
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors			
(3) an ability to communicate effectively with a range of audiences			
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives			
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions			
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies			

Prepared by and Date	Assoc. Prof. Dr. Ali Çınar / December 2019	
Semester	Spring 2019-2020	
Name of Instructors	Assoc. Prof. Dr. Ali Çınar and Asst. Prof. Dr. Ani Natali Şigaher	
Course Contents	Week	Topic
	1.	General Principles. Mechanics, Fundamental Concepts, Newton's Laws of motion, and SI units
	2.	Force Vectors. Scalars and Vectors. Vector operations. Vector addition of forces, coplanar forces, Cartesian vectors, position vectors, force vector along a line.
	3.	Equilibrium of a Particle. Condition for the equilibrium of a particle, free-body diagram, coplanar force systems
	4.	Three dimensional forces systems. Moment of a force, scalar and vector formulation, principle of moments, moment of a force about a point and an axis
	5.	Force System Resultants. Simplification of a force and couple system
	6.	Equilibrium of a Rigid Body. Condition for the rigid body equilibrium, free-body diagrams, equations of equilibrium
	7.	Constraints and statically determinacy. Reaction forces in beams and frames
	8.	Planar trusses. Methods of joints, zero force member, method of sections
	9.	Internal forces. Internal loading in a structural member
	10.	Shear force and bending moment diagrams of the beams under various loads
	11.	Dry friction. Frictional forces in structures and flat belts
	12.	Centre of gravity and centroid. Centre of gravity, center of mass, composite bodies, theorems of Pappus and Guldinus, resultant of general distributed loading
	13.	Moment of Inertia. Definition of moment of inertia, parallel axis theorem for an area, moment of inertia of composite areas.
	14.	Moment of inertia of composite areas, radius of gyration, mass moment of inertia
	15.	Final Exam/Project/Presentation Period
	16.	Final Exam/Project/Presentation Period

Required/Recommended Readings	Mechanics for Engineers: Statics, 13th Ed., R.C. Hibbeler, K.B. Yap SI Edition PEARSON 2013
Teaching Methods	Lectures/contact hours using "flipped classroom" as an active learning technique
Homework and Projects	-
Laboratory Work	-
Computer Use	-
Other Activities	-
Assessment Methods	Type of Assessments — Number — Ratio (%) Midterm Exams — 2 — 50(each contributing 25 %) Final Exam — 1 — 30* HW in Digital Platform — 5 — 10 Flipped Classroom Practice — 28 — 5* Small quiz after watching the videos — 15 — 5* Total — 100 * Final exam will cover all learning outcomes, and will be held in week 14 during evening hours. Solving problems during each class contributing 5 % of the total grade, watching the videos and taking test afterward contributing 5% of the total grade.
Course Administration	**Instructor's office and phone number:** 5th Floor 395-3682 **Office hours:** Wednesday 13:00 – 15:00 **Email address:** cinara@mef.edu.tr and sigahern@mef.edu.tr **Rules for attendance:** Classroom practice contributes to 10% of the final grade. **Missing a Midterm:** Provided that proper documents of excuse are presented, each missed midterm by the student will be given a grade by taking the average of all of the other midterms. No make-up will be given. **Missing Final Exam**: Faculty regulations. **A reminder of proper classroom behavior, code of student conduct**: YÖK Regulations **Statement on plagiarism**: YÖK Regulations http://www.mef.edu.tr/icerikler/files/lisans_onlisans_yonetmelik%20(1.pdf)

ECTS Student Workload Estimation

Activity	No/Weeks	Hours			Calculation	Explanation
	No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	g the Activity Requirements (D)		
Lecture	14	2	3	1	84	A*(B+C+D)
Digital HW	5	1	2		15	
Midterm(s)	2	15	1		32	A*(B+C+D)
Assingment, Project, Presentation					0	A*(B+C+D)
Final Examination	1	24	2		26	A*(B+C+D)
Total Workload					157	
Total Workload/25					6.28	
ECTS					**6**	