COURSE DESCRIPTION FORM	
Course Code and Title	CE223 MECHANICS I (STATICS)
Semester	3
Catalog description	Vectors, force, moment, statics of particles. Equivalent systems of forces, planar systems of forces. Statics of rigid bodies. Frames and trusses. Centroids of lines and areas, distributed forces. Internal forces in frames and beams and internal force diagrams. Moments of inertia of areas, Mohr's circles of inertia.
Required reading	R.C. Hibbeler, "Engineering Mechanics, Statics" (in SI Units), Pearson.
Recommended reading	F.P. Beer & E.R. Johnston, "Vector Mechanics For Engineers, Statics", Mc Graw Hill.
ECTS	5
Prerequisites and co-requisites	No prerequisite. Required attendance to lectures is at least 70% of total term hours.
Compulsory/Elective	Compulsory course
Language of instruction	English
Aim of course	The aim of this course to teach how to determine the equilibrium condition for particles and rigid bodies, the use of free body diagrams, how to distinguish statically determined and undetermined systems, determination of the internal forces for statically determinate systems, define area moment of inertia.
Learning outcomes of the course unit	Upon completion of the course student should be able to; 1. Determine the equilibrium condition of a particle / a rigid body using vectors, 2. Use free body diagrams to solve the mechanics problems, 3. Determine system of forces equivalent to applied forces on a body, 4. Distinguish between statically determined and undetermined systems, and be able to determine support reactions of statically determined systems, 5. Determine the internal forces for simple trusses using the method of joints and method of sections , 6. Determine the internal forces of statically determinate frames, 7. Define the types of beams, and draw internal force diagrams, 8. Determine the location of geometric center and center of gravity for distributed loads, 9. Define the area moment of inertia for certain geometric shapes, and be able to use the parallel-axis theorem.
Mode of delivery	The mode of delivery of this course is face to face.
Course content	1. Introduction: The applications of Newtonian mechanics in engineering, dimensions and units. 2. Force Vectors: Definitions, vector calculations, Cartesian vectors, components and resultant vectors, concurrent and coplanar forces. 3. Particle Equilibrium: Newton's laws, equilibrium of a particle, free body diagrams for concurrent forces, planar problems, and three dimensional problems. 4. Force Systems: Moment, vector product, Varignon's theorem, scalar product, mixed triple product, equivalent systems of forces and simplification, simplification of a distributed loading. 5. Equilibrium of Rigid Bodies: Internal and external forces, types of supports, free body diagrams, equilibrium for planar problems. 6. Equilibrium of Rigid Bodies: Two and three force bodies,

	three dimensional problems, statically determined and undetermined bodies. 7. Structural Analysis: Simple truss systems, methods of joints, zero force members, method of sections, space truss systems and Midterm Examination-1 8. Structural Analysis: Simple truss systems, methods of joints, zero force members, method of sections, space truss systems. 9. Structural Analysis: Frames, disassembling of frames, definition and determination of internal forces. 10. Internal Forces: Normal force, shear force and bending moment, types of beams, Gerber type beams, determination of internal forces. 11. Internal Forces: Axial force, shear force and bending moment equations and diagrams, relation between distributed loading, shear and bending moment. 12. Midterm Examination-2 13. Distributed Loading: Determination of geometric center, mass center and center of gravity, composite area and bodies, distributed loading, geometric center of volumes. 14. Moments of Inertia: Area moments of inertia, parallel axis theorem. 15. Moments of Inertia: Mohr circle of moments of inertia.
Planned learning activities and teaching methods	3 lecture hours per week (3+0) Reading Midterm exam and required works Final exam and required works
Assessment methods and criteria	

	Quantity	Percentage (%)
Mid-terms	2	60
Assignment	-	-
Exercises	-	-
Projects	-	-
Practice	-	-
Quiz	-	-
Contribution of In-term Studies to Overall Grade %		60
Contribution of Final Examination to Overall Grade (%)		40
Attendance		

Workload

Work activity	Total Week Count	Weekly Duration (in hour)	Total Workload in Semester
Theoretical Study Hours of Course Per Week	14	3	42
Practicing Hours of Course Per Week	0	0	0
Reading	14	3	42
Searching in Internet and Library	0	0	0
Designing and Applying Materials	0	0	0
Preparing Reports	0	0	0
Preparing Presentation	0	0	0
Presentation	0	0	0
Mid-Term and Studying for Mid-Term	2	15	30

Final and Studying for Final	1	15	15
Other	0	0	0
Total Workload:			129
Total Workload / 25:			5.16
ECTS:			5

Course's contribution to program

No	Program Learning Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems.					X
2	Ability to identify, formulate, and solve complex civil engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.				X	
3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.					
4	Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in civil engineering practice; ability to employ information technologies and to use at least one computer programming language effectively.					
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex civil engineering problems or discipline specific research questions.					
6	Ability to work efficiently in intra-disciplinary and multi-disciplinary teams.					
7	Ability to work individually.					X
8	Ability to communicate effectively in Turkish, both orally and in writing; ability to write effective reports and comprehend written reports.					
9	Knowledge of English of B1 level according to Common European Framework of Reference.				X	
10	Prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.					
11	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.					
12	Consciousness to behave according to ethical principles and professional and ethical responsibility.					
13	Knowledge on standards used in civil engineering practice.					
14	Knowledge about business life practices such as project management, risk management, and change management.					
15	Awareness in entrepreneurship, innovation; knowledge about sustainable development.					
16	Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering.					
17	Awareness of the legal consequences of engineering solutions.					

Name of lecturer(s) and contact information	Prof. Dr. Tekin GÜLTOP, tgultop@gazi.edu.tr, Prof. Dr. Kurtuluş SOYLUK,ksoyluk@gazi.edu.tr Assoc. Dr. Bahadır ALYAVUZ, balyavuz@gazi.edu.tr