Óbuda University Donát Bánki Faculty of Mechanical and Safety Engineering	Institute for Natural Sciences and Basic Subjects

Subject name and code: **Mechanics, BTEME2EBNF** Credits: **4**
Full-time English language course, 2025/2026 spring semester

BSc Programme in Engineering Management

Course coordinator:	Cocchioni Vince	Lecturer(s):	Cocchioni Vince
Course prerequisites:	-		

Weekly hours:	Lecture:2	Seminar: 1	Lab: 0	Consultation:
Requirements (form of assessment):	examination			

Course description

This course provides students with fundamental knowledge of statics, strength of materials, and introductory dynamics. Students will analyse forces in equilibrium, determine internal forces and stresses in structures, learn the basics of structural safety evaluation, and understand the fundamentals of motion and dynamic loading. The course emphasizes practical problem-solving skills and engineering decision-making relevant to managing technical projects. The course aims to help students to read engineering reports, communicate effectively with mechanical and structural engineers, and make informed decisions about structural design and safety.

Schedule

Academic week	Topics
1	Introduction to mechanics, and vector algebra foundations
2	Forces, moments and force couples, axioms of statics
3	Coplanar force systems (concurrent, parallel, and general)
4	Constraints and degrees of freedom, free body diagrams, introduction to reaction forces
5	Statically determinate beams and structures, calculating reaction forces
6	Internal forces and force diagrams - I.
7	Internal forces and force diagrams - II.
8	Centroids and second moment of area (moment of inertia)
9	Introduction to stress: axial tension and compression
10	Shear stress and torsion
11	Bending stress and failure analysis
12	Introduction to dynamics, kinematics
13	Kinetics: Newton's second law and applications
14	Work and energy

Course requirements

Academic week	Midterm exams, homework
8	1st midterm exam (25 points)
12	2nd midterm exam (25 points)
14	1st or 2nd midterm retake exam

Requirements:

- **Attendance:** Active participation in classes is compulsory; a maximum of 30% absence is permitted. Students who exceed the absence limit will be barred from receiving course signature and must retake the course in a future semester.
- **Midterm Exams**: Students must take two midterm exams, each worth a maximum of 25 points. Students must achieve a minimum of 25 points (50%) from the combined total of both midterm exams. Students may retake ONE midterm exam (either the first or the second) during the last week of the semester.
- **Signature Granted**: Students who meet the attendance requirement and achieve at least 25 combined points on the midterm exams (including any retake) are granted signature and may proceed to the final examination.
- **Signature Denied - Retake Exam**: Students who meet the attendance requirement but fail to achieve 25 combined points on the midterm exams (including any midterm retake) are denied signature and must take a comprehensive retake exam during the first 10 days of the exam period. Passing this retake exam (minimum 50%) grants signature and admission to the final examination. Students who fail the retake exam are barred from the final examination and must repeat the course.
- **Final Examination:** The examination is in written form, with a maximum of 50 points. Students must achieve a minimum of 20 points (40%) on the final exam. Students scoring below 20 points automatically receive a failing grade (1). Final grades are calculated from the combined scores of the midterm exams and the final examination (total 100 points):
  - 0-50 points: fail (1)
  - 51-62 points: pass (2)
  - 63-75 points: satisfactory (3)
  - 76-88 points: good (4)
  - 89-100 points: excellent (5)

Literature

Obligatory:

- Students' own lecture notes
- Materials available in Moodle

Suggested:

- Engineering Mechanics: Statics - R.C. Hibbeler
- Vector Mechanics for Engineers: Statics - Beer, Johnston, Mazurek, et al.

Budapest, 2026.01.22.

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Course coordinator