Basic Mechanics - BMEEOTMPRE3

I. Subject Specification

1. Basic Data

1.1 Title

Basic Mechanics

1.2 Code

BMEEOTMPRE3

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	5

1.5 Evaluation

Midterm grade

1.6 Credits

0

1.7 Coordinator

name	Dr. Kovács Flórián
academic rank	Associate professor
email	kovacs.florian@emk.bme.hu

1.8 Department

Department of Structural Mechanics

1.9 Website

https://epito.bme.hu/BMEEOTMPRE3
https://fiek2.mywire.org/course/view.php?id=600

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in Civil Engineering (Pre-engineering) programme

1.12 Prerequisites

1.13 Effective date

5 February 2020

2. Objectives and learning outcomes

2.1 Objectives

The aim of the subject is to provide solid basis for the BSc civil engineering courses in the fields of rigid body mechanics, kinematic and kinetic analysis of planar motions of material points and rigid bodies in case of planar motion, the procedure of statical analysis, the method for the calculation of reactions of simple and compound structures.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. knows the methods to determine the resultant of force systems,
2. knows the constraints used in statical models and the associated reaction types,
3. knows the basics of velocity, acceleration, angular velocity, angular acceleration, and the relationships between them,
4. has an overview on Newton's laws of motion and the major theorems based upon them,
5. understands the concepts of linear momentum, angular momentum, kinetic energy in the cases of material points and rigid bodies in case of planar motion,

B. Skills

1. solves the elementary equilibrium problems,
2. formulates and solves the equilibrium equations for the calculation of each reaction force of simple structures,
3. is able to characterize the motion of material points and rigid bodies in case of planar motion, to formulate the relationships between the variables,

C. Attitudes

1. aims at accurate and flawless problem solving,
2. elaborates the solution such that it is clear to understand or possibly to continue,
3. aims at precise and clear use of language,

D. Autonomy and Responsibility

1. is open to criticism,

2. is prepared to recognize and correct errors.

2.3 Methods

Lectures and calculation practices in the lessons, solving home works and practice problems in individual or team work.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Introduction, vectors
2.	Vectors – practice, Concurrent forces
3.	Forces with common point of line, Forces acting on rigid bodies - moment
4.	Forces acting on rigid bodies - practice
5.	Structures, supports, free body diagram
6.	Reaction forces
7.	Reaction forces – practice, Contact forces
8.	Contact forces
9.	Compound structures
10.	Compound structures - practice
11.	Kinematics – rectilinear, circular motion
12.	Kinetics – translational motion
13.	Kinetics – theorems, Kinetics of rigid bodies
14.	Summary, repetition

The above programme is tentative and subject to changes due to calendar variations and other reasons specific to the actual semester. Consult the effective detailed course schedule of the course on the subject website.

2.5 Study materials

Online materials:
Lecture notes: Németh- Kovács: Basic Mechanics (https://edu.epito.bme.hu/pluginfile.php/22468/mod_resource/content/0/LN-current-version.pdf)
Exercises: (https://edu.epito.bme.hu/pluginfile.php/26843/mod_resource/content/1/problems_T2.pdf)

2.6 Other information

- Attendance to lectures is compulsory. The signature and credits from the subject will be refused to students missing more than 30% of the classes.
- Students are evaluated based on their actual individual performance. Students are required to show evidence of their own knowledge and skills. Submitting a work of others, obtaining or giving unauthorized help (e.g. during an exam or test) cheating and plagiarism in any form is unacceptable. Whoever violate the respective Regulations of the University will be given a failing grade (1), without the possibility of retake and repeat, and will be reported to the Dean's Office.

2.7 Consultation

The instructors are available for consultation during their office hours, as advertised on the department website. Special appointments can be requested via e-mail: kovacs.florian@epito.bme.hu.

This Subject Datasheet is valid for:

Inactive courses

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

- Evaluation of learning outcomes described in Section 2.2. is based on two mid-term written checks.
- Mid-term tests below 50% are regarded unsuccessful.
- The dates of the checks can be found in the "Detailed semester schedule" on the website of the subject.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1st mid-term test (summarizing check)	ZH1	A.1-A.2; B.1-B.2; C.1-C.3; D.1-D.2
2nd mid-term test (summarizing check)	ZH2	A.3-A.5; B.3; C.1-C.3; D.1-D.2

The dates of deadlines of assignments/homework can be found in the detailed course schedule on the subject's website.

3.3 Evaluation system

Abbreviation	Score
ZH1	50%
ZH2	50%
Sum	**100%**

3.4 Requirements and validity of signature

There is no signature from the subject.

3.5 Grading system

- In the case of complying with the requirements on attendance the results are determined as follows.
- The semester is accomplished successfully if all mid-term tests are accomplished successfully.
- The final result is computed by the weighted average A of the mid-term tests as in section 3.3.:

Grade	Points (P)
excellent (5)	80%≤A
good (4)	70%≤A<80%
satisfactory (3)	60%≤A<70%
passed (2)	50%≤A<60%
failed (1)	A<50%

3.6 Retake and repeat

- Each mid-term test can be retaken once at dates announced at the beginning of the semester.
- In the case of each test, the better one of the results of ordinary test and its retake is considered.
- At the end of the semester a second retake of one of the tests is available to the students, if only one of the tests has no successful result at that time (i.e. one test is successful after the first retakes).

3.7 Estimated workload

Activity	**Hours/semester**
contact hours	14×5=70
preparation for the lessons	14×4=5
preparation for the checks	2×15=30
home studying of the written material	24
Sum	**180**

3.8 Effective date

5 February 2020

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Inactive courses