

Mechanics 3 (Dynamics)
Course Code: MSB257AN-EA-00, MSB257AN-
GY-01
Semester: Autumn 2017/2018

Course Syllabus
Location: PTE MIK, A-316 (Lecture)
A-301 (Practice)

General Information

Name of course: **MECHANICS 3 (DYNAMICS)**
Course Code: MSB257AN-EA-00
Semester: MSB257AN-GY-01
Number of Credits: 3rd
Allotment of Hours per Week: 4
Evaluation: 1 lectures + 2 practice / week
Prerequisites: Midterm Exams (Practice) + Final Exam (Theory)
Mechanics 1 (Statics)

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General Course Description

Introduction into the fundamentals of the dynamics - kinematics and kinetics of a particle and of the rigid body, mechanical vibrations.

Learning objectives

The aim of the course is to introduce the students into the following themes: Kinematics and kinetics of a particle. Constrained motion. Kinematics and kinetics of rigid bodies. Mass moments of inertia. Work and power theorems. Kinetic energy. Central and eccentric impact. Analysis of the free and forced vibrations with and without damping.

Methodology:

Lectures: will give the theoretical base knowledge of the dynamics

Practice: through examples the students will learn how to apply the theoretical knowledge to solve exercises

Exam: Accumulated knowledge is tested in three exams: two midterm exams (practice) and a final exam (theory). Both exams have to reach the minimum acceptable level (50% of the maximal point number). Failed or skipped midterm exams can be repeated twice (the second opportunity will be given in the exam period). The final exam can be repeated twice in the exam period.

Schedule:

Week	Topic of the lecture	Topic of the practice
Week 1	Kinematics of a particle, Kinematics of the rigid body	Kinematics of a particle
Week 2		Kinematics of the rigid body
Week 3	Instantaneous and finite motions Rigid body in plane motion	Instantaneous and finite motions
Week 4		Rigid body in plane motion
Week 5	Kinetics of a particle	Kinetics of a particle
Week 6		Kinetics of a particle
Week 7	Kinetics of rigid bodies	Kinetics of rigid bodies

	Collisions	
Week 8		<i>First midterm exam (Practice)</i>
Week 9	<i>Autumn vacation – no classes</i>	<i>Autumn vacation – no classes</i>
Week 10	<i>Retake of the first midterm exam</i>	Collisions
Week 11	Free vibrations without damping Damped free vibrations	Vibrations
Week 12		Vibrations
Week 13	Forced vibrations	Vibrations
Week 14		<i>Second midterm exam (Practice)</i>
Week 15	<i>Final exam (Theory) written during the theoretical class (90 minutes)</i>	<i>Retake of the second midterm exam</i>

Attendance

Attendance is required in the classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence more than 30% of the total number of lesson will be grounds for falling the class. The students are required to be punctual in the class and in case of illness or family urgency present a valid excuse (such as a doctor's note). The continuous following of the subjects and taking notes is mandatory. The subject of the missed class has to be worked out by the student based on the notes of the classmates and reference reading materials.

Grading

10% attendance
30% first midterm exam
30% second midterm exam
30% final exam

Grade	5	4	3	2	1
Evaluation in percent	85% - 100%	74% - 84%	63% - 73%	51% - 62%	0 – 50%

Bibliography

- J.L. Meriam, L.G. Kraige: Engineering Mechanics, Dynamics. John Wiley and Sons. 2003
- Beer, F.P., Johnston, E. R.: Vector Mechanics for Engineers. Dynamics, McGraw-Hill, 2004
- Tongue, B.H., Sheppard, S.D.: Dynamics. Analysis and Design of Systems in Motion, John Wiley and Sons, 2005
- William T. Thomson: Theory of Vibration with application, Chapman & Hall