General Information:

Name of Course: # ENGINEERING FLUID MECHANICS1

Course Code: MSB281ANEP
Semester: **1**
Number of Credits: 3
Allotment of Hours per Week: 2 Lectures /Week
Evaluation: Signature (with grade and) exam
Prerequisites: **None**

Instructor: **Dr. Gergely Nyitray**
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Introduction, General Course Description:

The aim of this course is to present the basic concepts of physics that students need to know for later courses and future careers. To emphasize that physics is a tool for understanding the real world. To teach transferable problem solving skills. Physics is the branch of science that describes matter, energy, space, and time in the most fundamental level. Physicists look patterns in the physical phenomena that occur in the universe. The goal is to find the most basic laws that govern the universe and to formulate those laws in the most precise way possible. The topics are the following:
Newtonian Mechanics, Thermodynamics, Electrodynamics.

Learning Objectives:

Problem-solving skills are central to an introductory physics course, these include:

- Thinking logically and analitically,
- Making simplifying assumptions,
- Constructing mathematical models,
- Using valid approximations,
- Understanding the basic laws of the universe.

Methodology:

- **Lectures**: will give an introduction to the Newtonian Mechanics, Thermal Physics, Electrodynamics.
- **Homework:** The students will receive homework to be prepared.
- **Exams:** Accumulated knowledge is tested in only one exam: a final exam (or Project Work). The feature of the exam computational for finding solution for physical problems. In case the exam fails or the student disagree with the grade of the final exam an examination comitte will be organized and the student can take a retake examination.

Schedule:

Week	Topic of lecture
Week 1	Course description. Orientation. Kinematics: Position, Displacement, Velocity
Week 2	Acceleration, Free Fall, Circular Motion, Projectiles Motion, Newton's Laws
Week 3	Work Done, Power, Work-Kinetic Energy Theorem
Week 4	Conservation of Energy, Gravitational Force, Simple Harmonic Motion,

Week 5	Pendulum, Damped Oscillations, Sound Waves, the Speed of Sound Waves
Week 6	Thermal Physics: Temperature, temperature Scales, Kinetic Theory of the Ideal Gases
Week 7	Heat, Heat Capacity, Specific Heat, The first laws of Thermodynamics, Thermodynamic processes, Heat engines, The second law of Thermodynamics
Week 8	Statistical Interpretation of Entropy, The Third Law of Thermodynamics,
Week 9	*Break – no class*
Week 10	Electrodynamics: Electric Charge, Electric Field, Field Lines, Electric Potential Energy, Electric Potential
Week 11	Electric Current, Electric Current Density, Direct Current, Alternating Current, Thermo-electricity, Electrolysis, Magnetic Fields.
Week 12	Optics: Speed of Light, the Laws of Reflection and Refraction, Optical Fibers, Optical Imaging, Plane Mirrors, Spherical Mirrors, Lenses, Aberrations, Optical Instruments, Cameras,
Week 13	Electromagnetic Radiations: Types of Luminescence, Black Body Radiation, Light Sources, Fundamentals of Photometry, Beer-Lambert Law
Week 14	**Final exam**
Week 15	**Second exam** (only if required).

Attendance:

To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Grading:

Final Exam (or Project Work)

Grade:	5	4	3	2	1
Evaluation in percents:	89%-100%	77%-88%	66%-76%	46%-65%	0-45%

Students with Special Needs:

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:

Gambiattista, Richardson, Richardson: “College Physics” McGraw-Hill International Edition 2007
ISBN-13 978-0-07-110608-5

Gergely Nyitray: “Fundamental Laws, Equations and Models I”
ISBN:978-963-429-347-7