PHYS1.1: MECHANICS & THERMODYNAMICS

I. Course description:

1. **Credit points**: 3 ECTS
2. **Time commitment:**

Items	Lecture	Tutorial	Practical	**Total**
No. of hours	20	10	--	**30**

3. **Prerequisites:** Mathematic Analysis
4. **Recommended background knowledge:** Basic knowledge in high school level
5. **Subject description:**

   The course consists of the following topics: linear motion and force, Newton's laws, balance of forces, energy and work, conservation law, momentum, rotational motion.

6. **Objectives & Outcome:**
   - *Understanding of fundamental concepts and mechanisms* involving motion, force, energy, momentum, heat, entropy that are needed for further studies in physics, engineering and technology.
   - *Build skills in formulating and solving problems*: improve thinking process and intuition through understanding fundamentals and applying that to solving practical problems.
   - *Increase mathematical and computational ability*: develop capability to find analytical solutions for some problems, while in others where such solutions are difficult or impossible to find, develop numerical/computational methods. These are the "hard" skills to prepare for any future science and technology career.
7. **Assessment/ Evaluation**

Component	Attendance	Class exercise	Midterm	Final
Percentage %	10	20	20	50

8. **Prescribed Textbook(s):**

   [1] Halliday and Resnick,Fundamentals of PHYSICS 10th Edition, Jearl Walker.

   [2] Young and Freedman, Sears and Zemansky's UNIVERSITY PHYSICS with Modern Physics, 13th Edition, Pearson-Addison Wesley.

   [3] Serway and Jewett, PHYSICS for Scientists and Engineers with Modern Physics,6th Edition, Thomson-Brooks/Cole.

II. Course content & schedule:

1. Force and Motion I
2. Force and Motion II
3. Energy, work and energy conversation law
4. Momentum, collision and momentum conversation law
5. Rotational motion, torque, rotational kinetic energy, angular momentum
6. Temperature, heat, and the First Law of Thermodynamics
7. The Kinetic Theory of Gases
8. Irreversible processes, entropy and the Second Law of Thermodynamics

III. Reference Literature:

[1] Halliday and Resnick,Fundamentals of PHYSICS 10th Edition, Jearl Walker