



## COURSE DATASHEET

<b>Semester:</b>	2012/13/2
<b>Course:</b>	Physics I exercises
<b>Code:</b>	VEMKFI1322A
<b>Responsible department:</b>	Institute of Physics and Mechatronics
<b>Department code:</b>	MKFI
<b>Responsible instructor:</b>	dr. István Szalai

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### Course objectives:

The main objectives of this course are: strengthen the understanding of basic physical concepts, laws and methods discussed in the lecture course with solution of problems in the classical mechanics.

### Course content:

1. Vector manipulations. 2. Position vector and its components as the function of time. Velocity and acceleration, calculation by derivative. 3. Tangential and normal acceleration. Circular motion. Calculation of trajectory from acceleration with integrating. 4. Newton's II law at inclined plane, pulley, circular motion. 5. Notion of work. Problems for the work-energy theorem. Problems for simple pendulum and slope with law of conservation of energy. 6. Problems for study of simple harmonic motion in point of kinematics and dynamics. 7. Essay written: 4 problems, 90 minutes. 8. Force fields, movements in gravitational fields. 9. Center of mass, conservation of momentum. 10. Collisions. 11. Rotation of a rigid body about a fix axis. Moment of inertia, torque, angular acceleration. 12. Rolling motion of a rigid body, rotational kinetic energy. 13. Summary and practice. 14. Summary and practice. 15. Essay written: 5 problems, 90 minutes.

### Requirements, evaluation and grading:

Successful problem solving in the essays.

### Required and recommended readings:

Demény-Gergelyi-Gugolya-Kronome-Palágyi-Vonderviszt: Fizika Feladatgyűjtemény I. Veszprémi Egyetemi Kiadó Veszprém, 2002. Vonderviszt-Németh-Szalai: Fizika I., Veszprémi Egyetemi Kiadó 2003. Feynman: Mai fizika 1,2, 4, 10, Műszaki Könyvkiadó, Budapest Baranyi Károly: A fizikai gondolkodás iskolája 1., 3., Akadémiai Kiadó, Budapest Serway, R. A.: Physics for Scientists & Engineers, Saunders College Publishing