UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester:	2013/14/2
Course:	Physics III.
Code:	VEMKFIM112F
Responsible department:	Institute of Physics and Mechatronics
Department code:	MKFI
Responsible instructor:	dr. Csaba Németh

Course objectives:

To deepen and broaden of the knowledge of students, reviewing of a few selected subjects of modern physics.

Course content:

1. Statistical physical description of many-body systems. Phase transitions and critical phenomena. 2. Dielectric, optical and magnetic properties of condensed matters. 3. Transport properties. Electronic and heat transport. 4. All is not well with classical physics: experimental basis of quantum physics. 5. Physical observables in quantum mechanics: operators. Coordinate, momentum, angular momentum. Stern--Gerlach experiment. NMR. 6. Quantum statistics. Degenerated quantum gases. Specific heat of metals. 7. Theory of chemical bonding. Ionic, covalent, metallic and van der Vaals bonds. 8. Quantum mechanical explanation of magnetism. 9. Superconductivity. 10. Quantum system's interaction with radiation, transitions between quantum states. Laser. Holography. 11. Internal structure of atoms and the periodic table. 12. Internal structure of nucleus. Nuclear models. 13. Nuclear radiations, nuclear fission and fusion. 14. Basis of the particle physics. 15. Astrology. Cosmology. The large scale structure of the universe.

Requirements, evaluation and grading:

exam

Required and recommended readings:

Budó-Mátrai: Kísérleti fizika III., Tankönyvkiadó, 1977. Feynman-Leighton-Sands: Mai fizika 7-9. kötetek, Műszaki Könyvkiadó, 1986. Kittel: Bevezetés a szilárdtestfizikába, Műszaki Könyvkiadó, 1981. Muhin: Kísérleti magfizika, Tankönyvkiadó, Bp., 1985.