



COURSE DATASHEET

Semester:	2012/13/1
Course:	Electron and photonphysics
Code:	VEMKFI1214I
Responsible department:	Institute of Physics and Mechatronics
Department code:	MKFI
Responsible instructor:	dr. Péter Gurin

Course objectives:

Teaching basic knowledge about micro-physical processes that have important role in the hardware of informatics, moreover developing skill on modeling of various processes.

Course content:

1. Experimental basis of quantum physics. 2. Bohr's theory. 3. Physical observables in quantum mechanics: operators. Coordinate, momentum, angular momentum. 4. State of a system. Schrödinger's equation. 5. Special problems: particle in a box. 6. Harmonic oscillator, hydrogen atom. 7. Perturbation theory. 8. Relativistic quantum theory. Dirac's equation. 9. Many particle problem in quantum mechanics. 10. Electron in periodic potential. Bands in a solid. 11. Quantum statistics: fermions and bosons. 12. Semiconductor devices. 13. Edison's effect, Schottky's effect. 14. Quantum theory of electromagnetic field. 15. Interaction of atoms with electromagnetic field.

Requirements, evaluation and grading:

exam

Required and recommended readings:

N. Garcia, A. C. Damask: Physics for computer Science students, John Wiley & Sons, New York, 1986. Nagy Károly: Kvantummechanika, Tankönyvkiadó, Budapest, 1986. R. P. Feynman, R. B. Leighton, M. Sands: Mai fizika 7-9, Műszaki Könyvkiadó, Budapest, 1986 S. Brandt, H. D. Dahmen: Quantum Mechanics, Springer-Verlag, Berlin, 1994.