UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester:	2016/17/1
Course:	Optics and Laser Technology
Code:	VEMKFI4212O
Responsible department:	Institute of Physics and Mechatronics
Department code:	MKFI
Responsible instructor:	dr. Zoltán Gugolya

Course objectives:

The main objectives of this course are: presentation of the basic concepts and principles of optics, transfer the basic knowledge about lasers used in the industry and the everyday life, emphasize the possibilities providing by the laser techniques in planning the mechatronics systems and sensors.

Course content:

1. Maxwell's equations. The light is an electromagnetic wave.
2. Geometrical optics. Fermat's principle. Law of reflection. Snell's law.
3. Prism, total reflection of light, optical fiber
4. Mirrors
5. Thin lens
6. Optical aberrations 7
7. Optical instruments
8. Physical optics, interference, diffraction
9. Polarization
10. Black-body radiation, photoelectric effect. Wave–particle duality
11. Atomic models (Bohr, Schrödinger)
12. Light interactions with matter
13. LASER, metastabil nívó, population inversion, metastable excited states, stimulated emission, , optical amplifier
14. Laser pumping energy
15. Specific laser systems

Requirements, evaluation and grading:

exam

Required and recommended readings:

Young, M.: Optics and Lasers. Springer-Verlag, 2000. Demtröder, W.: Laser Spectroscopy . Basic Concepts

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Required and recommended readings:

and Instrumentation. Springer-Verlag 2003. Eichler, J., Eichler, H.J.: Laser . Bauformen, Strahlführung, Anwendungen. Springer-Verlag 2003.