SUBJECT DETAILS AND SYLLABUS
2019/2020. I. SEMESTER

Subject Name	***Basic laws, equations and models 3.***
Subject code	***IVB290ANVM***
Classes per week (L/P/Lab)	***1,2,0***
Number of Credits	***4***
Division/type	***Electrical Engineering (BSc)***
Program	***full-time***
Requirement	***exam***
Semester	***3rd / 2019-2020. fall***
Preliminary requirements	***-***
Organization name	***Institute of Information and Electrical Technology***
Responsible Lecturer(s)	***Zsolt Kisander, Dr. Gergely Nyitray***

GOAL OF INSTRUCTION

This course gives an introduction to optics. Students will learn how to model and solve optics related problems that are common in the engineering practice.

SUBJECT CONTENT

Lecture:

1. Historical background. Basic properties of light. Principles of ray optics.
2. Reflection and refraction. Huygens's principle. Total internal reflection.
3. Image formed by flat mirrors, spherical mirrors.
4. Image formed by refraction, thin lenses.
5. Spherical and chromatic aberrations of lenses.
6. The human eye as an optical device. Magnifiers, microscopes and telescopes.
7. Wave optics, Young's double-slit experiment. Waves in interference, intensity distribution of the double-slit interference.
8. Change of phase due to reflection, interference in thin films, soap bubble.
9. Diffraction. Diffraction patterns of narrow slits. Diffraction grating. Applications in crystallography.
10. Polarization of light waves, polarizing filters.
11. Quantum mechanical properties of light, black-body radiation. Quantum harmonic oscillator.

EXAMINATION AND EVALUATION SYSTEM

The midterm test consists 4-5 problems from different chapters, which can be proofs or calculations. The exact time of the test will be announced on the 12th week. Students have to pass the midterm test to get the signature. The final grade is the midterm grade.

LITERATURE

- Physics for Scientists and Engineers 9th ed., Serway and Jewett, 2013, ISBN-13: 9781133947271
- Fundamentals of Photonics 2nd ed., Saleh and Teich, 2012, ISBN-13: 9788126537747

SCHEDULE

	STUDY PERIOD, STUDY WEEKS															EXAM PERIOD				
2019/2020. II. SEMESTER	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	1.	2.	3.	4.	5.
Lecture number																				
Practice/Labs number																				
Midterm test														x						
Homework **publishing**																				
Homework **submitting**																				
Signature/Semester rating																				
Exam																				

2020. ……

……

responsible lecturer