E – Charakteristika studijního předmětu/Subject Specification

Název studijního předmětu / Subject title	Selected Parts of Physics				
Typ předmětu / Subject type	Obligatory			**dopor. ročník / semester/ recommended year / semester**	1/1
Rozsah studijního předmětu / Study load in hours and credits	4+4	**hod. za týden / weekly load**	8	**Kreditů / Credits**	10
Jiný způsob vyjádření rozsahu / Other expression of study load	14 weeks, each 4 hours of lectures and 4 hours of seminary				
Způsob zakončení / Assessment	Examination			**Forma výuky / Form of teaching**	Lectures lab. seminars
Další požadavky na studenta / Other demands on students					

Vyučující / Lecturer

Aleš Richter Prof. M. Sc., Ph.D., Václav Kopecký, Prof., M. Sc., Ph.D., Milan Hokr, Assoc. Prof., Ing., Ph.D.

Stručná anotace předmětu / Subject annotation

Part 1 – Continuum mechanics
Derivation and application of basic equation of elasticity theory – imaginary cut, Hooke's law, stress and strain tensors, principal stresses. Technical problems – torsion and bending. Formulation of boundary value problems. Introduction to variational methods – virtual work, minimum energy, Castigliano's principle. In exercises, simple engineering problems of tension in trusses, torsion and bending are solved.

Part 2 – Electromagnetics
Lumped versus distributed electrical circuits. Electromagnetic Components. Maxwell's equations. Static electric field. Steady electric currents. Static magnetic field. Time-varying fields and Maxwell's equations. Transient response of transmission lines. Electromagnetic waves.

Part 3 - Optics:
Electromagnetic optics – electromagnetic theory of light, wave equation in homogeneous and inhomogeneous medium, monochromatic electromagnetic waves, plane, spherical a Gaussian electromagnetic waves.
Wave optics – wave optics postulates, wave equation and Helmholtz equation, interference a multiple interference.
Fourier optics – optical Fourier transformation, diffraction, holography.

Informace ke kombinované nebo distanční formě / Information for students in external form of study

Rozsah konzultací (soustředění) / Consultations, study meetings	3	**hodin za týden / hours per week**

Rozsah a obsahové zaměření individuálních prací studentů a způsob kontroly / Individual student work – type, load, content and way of checking

Type: theoretical and experimental work in laboratory
Content: computation exercises and laboratory experiments
Load: approx. 8 hours
Checking: Progress checking and completion checking at the end of the course

Studijní literatura a studijní pomůcky / Reading list and study utilities

Umran, S. I., Avis S. I.: Engineering Electromagnetics, Addison Wesley Longman,1999, USA
Edminister, J. A.: Electromagnetics, Crash course, McGraw-Hill, 2003,USA
Bahaa, E., A., Saleh, Malvin, C., T.: Fundamentals of Photonics, John Wiley & Sons, Inc., (ISBN: 978-0-471-83965-1) New York 1991
L.D. Landau, E.M. Lifshitz, Course of Theoretical Physics: Theory of Elasticity Butterworth-Heinemann, ISBN 0-7506-2633-X
http://en.wikibooks.org/wiki/Solid_Mechanics