

Course title: Plasma technologies		
Status: elective		
ECTS: 15		
Requirements: Physics of plasma		
Learning objectives Obtaining knowledge about the basic processes in plasma technologies concerning their wide applications.		
Learning outcomes Developed abilities: - General: general knowledge about plasmas application; - Specific: knowledge about specific technologies, which can be transferred in practice.		
Syllabus <i>Theory</i> Basic theory of ionized gases. Equilibrium plasmas. Non-equilibrium plasmas. Models of RF and DC discharges. Plasma interaction with surfaces. Discharges on atmospheric and high pressures. Application of plasma chemistry. Thin layers deposition. Ion implantation. Plasma etching. Production of the integrated circuits. Glow discharges. Inductively coupled plasmas. Gaseous lasers. Plasma polymerization. Sterilization by plasmas. Hardening of tool surfaces. Plasmas in energetics. Fusion. Plasma switches. Deposition of carbon layers. Fullerenes and nanotubes. <i>Practical</i> Plasma interaction with surfaces at atmosphere pressure. Example of MHD generator. Use of plasma switches.		
Literature 1. J. Reece Roth, Vol. 1 Principles, Industrial plasma engineering, Institute of Physics Publishing, Bristol and Philadelphia (1995). 2. J. R. Roth, Industrial Plasma engineering, Vol. 2 IoP, Bristol, 2001. 3. M.A.Lieberman i A.J.Lichtenberg, Principles of Plasma Discharges and Materials Processing, John Wiley and Sons (1999) 4. W. N. G. Hitchon, Plasma Processes for Semiconductor fabrication, Cambridge Univ. Press (1999).		
Weekly teaching load:	Theory: 4	Students research work: 6