

Course Unit Descriptor

Study Programme: Physics			
Course Unit Title: Plasma technologies			
Course Unit Code: FD18PT			
Name of Lecturer(s): Full Professor Zoran Mijatović			
Type and Level of Studies: PhD			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Summer			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face			
Number of ECTS Allocated: 15			
Prerequisites: Physics of plasma			
Course Aims: 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.			
Required Reading: 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 Contact Hours:	Lectures: 4	Practical work: 6	
Teaching Methods: Lectures and students group work			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Active class participation		written exam	
Test I and Test II		oral exam	60
Preliminary exam(s)		
Seminar(s)	40		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.