

SEMESTER 2 (summer), total 300 hours = 225 O^{*)} + 75 F^{**)}, ECTS: 30 (22 O + 8 F)

^{*)} O – Obligatory courses (in yellow)

^{**) F – Facultative courses (in pink)}

no.	courses	type	hours	ECTS	credit
1	Nanostructures – properties and formation <ul style="list-style-type: none"> Electronic properties of 2-D, 1-D and 0-D dimensional systems Surface and interface as a 2-D structures Thin films formation, lithography and analysis Tunneling effect and tunneling diode Magnetic interface - GMR and TMR effects Charge transport in 1-D systems 0-D structures as a Single Electron Transistors Potential application of fullerenes and carbon nanotubes in electronics Molecular electronics 	lecture&classes	45 O (30l+15c)	5	exam
2	Scanning probe microscopies – imaging and touching of the nanoworld <ul style="list-style-type: none"> The fundamental interactions in nature Friction - from macro to nanoscale Principles of operation of scanning probe microscopies Scanning Tunneling Microscopy – a tool for the imaging and characterization of nanostructures' electronic properties Atomic Force Microscopy –based methods of material characterization down to atomic scale Principles of operation of electron microscopies Focused Ion Beam - sculpture in the nanoworld 	lecture	30 O	4	exam
3	Organic electronics <ul style="list-style-type: none"> Electronic properties of conjugated molecules Charge transport in organic materials Materials and technology for organic electronics Organic Field Effect Transistors (OFET) Organic Light Emitting Diodes (OLED) Organic Photovoltaic Devices (OPV) Biosensors Laboratory Fabrication and characterization of OFET and OPV 	lecture	30 O	4	exam
4	Advanced methods of material characterization	laboratory	90 O	7	assessment
5	English language II	classes	30 O	2	exam
6	Molecular modelling by quantum chemistry methods	lecture&classes	45 F (15l+30c)	5	exam
7	Molecular modelling of materials	lecture&classes	45 F (15l+30c)	5	exam
8	Molecular electronics	seminar	30 F	3	assessment
9	Semiconductors	seminar	30 F	3	assessment