

## DESCRIPTION OF THE COURSES

- Course code: ARR1204
- Course title: FUNDAMENTALS OF ELECTROTECHNOLOGY PROCESSES
- Language of the lecturer: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	2		1		
<i>Number of hours/semester*</i>	30		15		
<i>Form of the course completion</i>	<i>w r i t t e n test</i>		<i>reports</i>		
<i>ECTS credits</i>	2		1		
<i>Total Student's Workload</i>	60		30		

- Level of the course (basic/advanced): basic
- Prerequisites: Fundamental physics.
- Name, first name and degree of the lecturer/supervisor: Bolesław Mazurek, prof., DSC., Ph.D.,
- Names, first names and degrees of the team's members:
  1. Jan Ziaja, Ph.D.
  2. Leszek Woźny, Ph.D.
  3. Zbigniew Zubel, Ph.D
- Year:.....III..... Semester:.....6.....
- Type of the course (obligatory/optional): optional
- Aims of the course (effects of the course):  
Acquaintance with basic industrial processes of manufacturing various materials and methods of modification of their properties. Ability to application of this knowledge to obtainig of thin film materials.
- Form of the teaching (traditional/e-learning): traditional
- Course description:  
Physical and chemical basics of technological processes. Methods of superconductors, semiconductor, conductors and dielectric materials production. Technology of thin films ( vacuum evaporation, electron-beam, plasma process, plasma polymerization, laser ablation).
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Introducing to lecture, program, requirements.	1
2. Direct and non direct resistance and infra-red heating.	3
3. Arc heating.	2
4. Dielectric furnaces.	2
5. Operation principle and application of induction furnace.	2
6. Physical principles of vacuum evaporation.	3
7. Physical basics of magnetron sputtering DC, AC, RF, and impulse	4

evaporation.	
8. Plasma reactors.	2
9. Plasma polymerization.	2
10. Electrolytic and chemical polishing.	2
11. Laser ablation. Ion-beam sputtering	2
12. Galvanopasty process. Conversion coating.	2
13. Fundamentals of diffusion process and ceramic technologies.	2
14. Written test	2

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
  1. Vacuum evaporation.
  2. Ion-beam sputtering.
  3. Magnetron DC and AC sputtering.
  4. Impulse magnetron sputtering.
  5. Plasma polymerization.
- Project – the contents:
- Basic literature:
  1. Mieczysław Hering, Podstawy elektrotermii, WNT, Warszawa 1992
  2. Janusz Groszkowski, Technika wysokiej próżni, WNT, Warszawa 1983
- Additional literature:
  1. Conrad Krampitz, Elktrotechnologie, VEB Verlag Technik, Berlin 1978
  2. Alfred Grill, Cold plasma in materials fabrication, IEEE Press, New York 1993
- Conditions of the course acceptance/creditation: Written test passed.
- - depending on a system of studies