DESCRIPTION OF THE COURSE

Name of the course: **Manufacturing in Electronic Industry.**	Code: BIE69-2	Semester**:** 8
Type of teaching: Lectures and laboratory work	Lessons per week: L –2 hours; LW –1,5 hours	Number of credits: 4

COURSE STATUS IN THE CURRICULUM: Optional for the students specialty Industrial Engineering BEng. program of the English Language Faculty of Engineering.

AIMS AND OBJECTIVES OF THE COURSE: To give knowledge about technological processes and sequences used in the contemporary microelectronics, principles of operation, parameters, design requirements and practical application of microelectronic devices and processes. This will give them the possibility to find the right and optimal way for solving of specific constructional or technological problems, and producing of right and proper reaction, corresponding to the situation.

DESCRIPTION OF THE COURSE: The main topics concern: Basic technology materials in electronic manufacturing – conducting, resistive, insulating; Thin film deposition methods; Thick film screen printing technology; Photolithography methods and technological steps; Maskmaking; Dry and wet etching; Printed circuit boards (PCBs); Surface mount technology (SMT); Basic materials in semiconductor technology; Thermal oxidation of Silicon; Diffusion in Silicon; Ion implantation; Epitaxy; Recent mounting and assembly procedures – probing and marking, scribing, breaking, die attachment, wire and tape automated bonding; Encapsulating and housing of electron devices, integrated circuits and PCBs; Bipolar Integrated Circuits (ICs) - basic technological process; Elements of bipolar ICs – the n-p-n transistors, the p-n-p transistors, diodes, passive circuit elements; MOS Integrated Circuits; Basic CMOS process; Elements of CMOS ICs – the NMOS and the PMOS transistors.

PREREQUISITES: Physics, Electronics, Production systems, Operational Research.

TEACHING METHODS: Lectures, using slides, case studies, laboratory work, work in teams, protocols preparation and defence.

METHOD OF ASSESSMENT: A two-hours exam at the end of semester (80%) plus laboratories (20%).

INSTRUCTIONAL LANGUAGE: English.

BIBLIOGRAPHY:

1. W. S. Ruska, “Microelectronic Processing. An introduction to the Manufacture of Integrated Circuits, McGraw Hill Book Company, 1987;
2. W. Maly, Atlas of IC Technologies, Benjamin/Cummins Publishing, 1987;
3. Donnard de Cogan, Design and Technology of Integrated Circuits, John Wiley & Sons, 1990;
4. P. van Zant, Microchip Fabrication, McGraw Hill Book Company, 1990;
5. Sze S. M.; Semiconductor Sensors. New York u.a.; John Wiley & Sons 1994.