



## МИНИСТЕРСТВО НА ОБРАЗОВАНИЕТО И НАУКАТА

Проект BG051PO001-3.1.07-0048 „Актуализиране на учебните планове и програми на специалностите във ФЕТТ, ФТК и МТФ на ТУ-София и създаване на нова съвместна магистърска специалност в съответствие с потребностите на пазара на труда“

**DESCRIPTION OF THE COURSE**

Name of the course: <b>Microelectronic technologies for alternative energy sources</b>	Code: <b>MMTN 11.1</b>	Semester: 2
Type of teaching: <b>Lectures, seminar and laboratory works</b>	Lessons per week: L-1 h, SW – 1 h, LW-2 h	Number of credits: 5

**LECTURER(S):**

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**COURSE STATUS IN THE CURRICULUM:**

This is elective course in specialty "Microtechnology and nanoengineering" for Master of Science degree.

**AIMS AND OBJECTIVES OF THE COURSE:**

Students gain knowledge of the latest approaches and technologies to generate "green energy" to build such elements in a compact form suitable for mobile applications, the properties of the materials used for their fabrication and their main characteristics. The topics in this course cover the design, manufacture and testing of components used to generate electrical energy from lost energy (dissipated scattered in the space as unuseful). Attention is paid to the practical work with these elements.

**DESCRIPTION OF THE COURSE:**

Subjects such as generating energy from movement and vibration, solar energy, temperature gradient and hydrogen cells will be studied.

**PREREQUISITES:** Knowledge in material science, nanomaterials, physics, nanochemistry surface technology for micro-and nanosystems is necessary.

**TEACHING METHODS:** Lectures are held in the hall with multimedia. The laboratory group conduct a topic under the guidance of assistant on specialized technology equipment and instrumentation. Seminar groups are divided into subgroups, to each of which is assigned additional homework regarding more advanced study of specific properties or applications of the microelectronics application for energy harvesting.

**METHOD OF ASSESSMENT:** Assessment (current control) during the semester and ongoing evaluation. Laboratory work's mark is obtained as an average of the working protocols during the semester. The student should prepare a paper on a chosen theme. Two tests are running.

**TEACHING LANGUAGE:** Bulgarian (with possibility for English teaching).

**BIBLIOGRAPHY:**

- 1 Shashank Priya, Daniel J. Inman: Energy Harvesting Technologies, Springer US, 2009.
2. Kong Bing, Tao Li, Waste Energy Harvesting: Mechanical and Thermal Energies, Springer, 2014.