



## 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>Modeling and control of thermal effects in microsystems</b>	Code: <b>MMTN 10.1</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 an optional course of specialty "Microtechnology and nanoengineering" for Master of Science degree.

**AIMS AND OBJECTIVES OF THE COURSE:**

The aim of the course is to provide students with knowledge of the fundamental problems of heat transfer, thermal modeling in the design to ensure reliable performance and affordable price of microsystems. It gradually examines the issues at the level of materials, components, modules and systems.

**DESCRIPTION OF THE COURSE:**

At the end of the course students will: develop skills to assess the influence of external heat and power dissipation in the system, and knowledge of using thermal analysis and simulation tool for the evaluation and management of the heat distribution in the design; can assess the impact of the size of nanomaterials, methods of calculation, thermal routes, the use of software for modeling and simulation of components, heat removal, application of thermal management; knows the need for thermal management, heat, thermal design, mechanisms and modes of heat transfer and thermal properties of materials.

**PREREQUISITES:**

Basic knowledge in technology for micro-and nanosystems, nanomaterials, basic principles and application of micro-and nanosystems, nanocommunicational devices and networks, are necessary.

**TEACHING METHODS:**

Lectures are held in the hall with multimedia. The laboratory group perform a topic under the guidance of the supervisor.

**METHOD OF ASSESSMENT:** Current estimation**TEACHING LANGUAGE:**

Bulgarian

**BIBLIOGRAPHY:**

1. M. Stanisavljevic, • A. Schmid, •Y. Leblebici, Reliability of Nanoscale Circuits and Systems. Methodologies and Circuit Architectures, Springer, 2011.
2. Nanoelectronics and information technologies, Reiner Waser (Ed.), WILEY-VCH, 2012.