



Европейски съюз

ОПЕРАТИВНА ПРОГРАМА
„РАЗВИТИЕ НА ЧОВЕШКИТЕ РЕСУРСИ“ 2007-2013



Европейски социален фонд

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: Quantum physics	Code: MMTN07.2	Semester: 2
Type of teaching: Lectures, seminar and laboratory works	Lessons per week: L-1 h, SW – 1 h, LW-2 h	Number of credits: 5

LECTURER(S):

Assoc. prof. PhD Georgi Angelov (FEET), phone 9653115, email: angelov@ecad.tu-sofia.bg
Department of Microelectronics, Faculty of Electronics, Technical University of Sofia.

COURSE STATUS IN THE CURRICULUM:

Elective for students in "Microtechnology and nanoengineering" for the degree "Master".

AIMS AND OBJECTIVES OF THE COURSE:

The aim of the course "Quantum Physics" is to familiarize students with basic phenomena, processes and theory of quantum mechanics and its applications in the modern nanotechnology. The knowledge and skills will allow them to gain knowledge about the applications of quantum phenomena and effects in electronics.

DESCRIPTION OF THE COURSE:

Students study about the basic aspects of quantum physics: Introduction to quantum physics - a historical aspects; Dimensional quantum mechanics - wave mechanics, potential barriers- δ , function; Operator methods in quantum mechanics; Multidimensional quantum mechanics - angular momentum, central potential; Motion in a magnetic field; Variational methods for computing stationary states - method of Wentzel-Kramers-Brillouin (WKB); Identical particles, quantum statistics; Structure of atoms; Field theory - photons, phonons, quantum electrodynamics; The time-dependent perturbation theory; Radiation transitions; Theory of scattering;

PREREQUISITES:

Basic knowledge in physics and mathematics are needed.

TEACHING METHODS:

Lectures using visual aids. Seminars conducted based on materials given by assistants, during which students have the opportunity to learn about the studied phenomena and theory.

METHOD OF ASSESSMENT:

Exam at the end of the semester.

TEACHING LANGUAGE:

Bulgarian

BIBLIOGRAPHY:

1. М. Д. Матеев и А. Д. Донков, „Квантова механика“, Издателство на СУ, София, 2010.
2. Roger G. Newton, „Quantum Physics. A Text for Graduate Students“, Springer-Verlag, New York, 2002.