

Course Description

Discipline/Course: Optical Materials and Technology

Department of Lasers and Lighting Engineering

Instructor: Vaganov Vitaliy

Contact details: +7 9521841500, email: 21vitas@tpu.ru

Learning Outcomes: Optical materials describe the basic mechanisms that determine the optical behavior of metals, insulators, semiconductors, laser materials and nonlinear materials. It is necessary to learn the basic directions and directions of development of light, optical and laser technologies, optical and lighting technical materials. Be able to use modern equipment to study the optical Materials also to learn the basic directions of discipline and directions of development of light, optical and laser emission.

Course Objectives and Content: The discipline is intended to provide an in-depth treatment of atomic composition and chemical makeup, electronic states, and the band structure and physical microstructure of materials related to their optical behavior. Learning the principles of the luminous flux interaction with matter, the structure and properties of optical materials, the indicators of quality for optical materials, the basics of manufacturing optical components and coating technology.

Course Outline:

Section 1. The polarization and angular distribution of light reflected from various surfaces

Section 2. The study of indicatrices by the scattering reflective and transmissive optical materials

Section 3. The measurement of the spectral and integral coefficients of the lighting materials

Section 4. The investigation of spectra and the luminescence temperature quenching of phosphors

Section 5. The investigation of the electroluminescent capacitor

Section 6. The investigation of LED characteristics

Section 7. The investigation of the damping kinetics of luminescence of crystalline phosphors

Course Delivery: one semester, 18 weeks

Prerequisites: For students it is necessary to obtain preliminary theoretical knowledge for conducting laboratory works

Co-requisites: Disciplines of Optical Materials and Technology

Final Assessment: fail test

Course Developer: Elena Fedorovna Polisadova, PhD