

Course Description

Discipline/Course: Optical and lighting devices

The basic specialty of Educational Program: OPTOTECHNICS

The department of laser and lighting engineering

Lecturer: Tatyana V. Grechkina, PhD

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Learning Outcomes:

The discipline focuses on acquisition of practical training the students in the problem solving:

To know: the basic concepts, characteristics and elements of the construction of light devices;

at the level of reproduction: To analyze light devices by the types and principles of the action of optical systems

at the level of understanding: Basic concepts, characteristics and elements of the design of light instruments

Theoretical skills: Theoretical aspects and principles of calculation of optical systems of light devices;

Practical skills: Apply the possibility application software packages for solving problems of engineering technology.

Skills: work with CAD system.

Academic content of the course:

Section 1. Basic characteristics of light devices

Section 2. The main types and principles of the operation of optical systems of light devices

Section 3 Theoretical aspects and principles of calculation of optical systems of light devices

Section 4. Variety of light devices

Section 5. Computer modeling methods and diagnostics of the component parts of a light device

Section 6. Development of project documentation. Formation of the list of settlement documents (DIALux).

Section 7. Prospects and trends in the development of light devices

Lab 1. Nomenclature of lighting products. Fixtures. Searchlights. Light technical characteristics, optical and structural devices

Lab 2. A light device in the DIALux space (the study of computer capabilities for visualizing the basic lighting parameters of a light device, editing and processing data, creating results sheets.)

Lab 3. Analysis of the result of illumination of horizontal surfaces at different heights, created by a luminaire of specified parameters; Assessment of the degree of attenuation of the maximum illumination of glass products.

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Lab 4. Creation of a decorative lamp 3D model (sconce, chandelier, floor, table, etc.).

Lab 5. Lighting devices of searchlight type "Traffic light".

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Lab 6. Industrial and theatrical lights "White Light"

Lab 7. Lighting devices projector type, scenes of lighting with controls "Olympic Rings"

Course Delivery: one semester, 18 weeks

Prerequisites: "Fundamentals of lighting", "Fundamentals of Optics", "Sources and receivers of optical radiation", "Optical materials and technologies".

Co-requisites: «Design of lighting installations», «Calculation and design of light devices»

Final Assessment: pass/fail test

Course Developer: Tatyana V. Grechkina, PhD