

Course “CALS strategy in optical engineering”

Field of study: Optical engineering

Course level: Master

Specialization: 200400.68

	Hours						
Semester	Workload	Lectures	Practical work	Lab.	Seminar	Independent studies	Tests
Autumn	144	17	0	51	38	38	Exam

Abstract

Course "CALS strategy in optical engineering" covers a range of issues associated with the basic principles of the organization of the optical devices design process. Basic working methods of the development of optical instruments in modern production are considered. The focus is on Continuous Acquisition and Lifecycle Support and on the documentation development process automation.

Study of the subject produces the following competencies: the ability to maintain a unified information space planning and management of the enterprise at all stages of the product life cycle; the ability to use effectively the specialized software for the automated design and CALS-tech solutions in scientific, technical, design, engineering and technological areas of the optical engineering.

Goals and Objectives of the Course

Knowledge

- basic knowledge of the information support of the product life cycle,
- the principles of organization of the design process of optical devices in the concept of information support of the product life cycle;

Theoretical Skills

- ability to perform the design documentation for the optical device,
- ability to use the modern media-aided design and engineering, and information systems to support the product lifecycle;

Practical Skills

- skills of working in a variety of modern software packages for the design documentation, product data management.

Course prerequisites:

The necessary conditions for studying the discipline are: knowledge of higher mathematics, physics, basic geometric optics, basic engineering, computer science, the ability

to develop algorithms, skills in working with a PC and software products for the computer-aided design of optical systems.

Course structure

Volume of the course: 4.0 ECTS credits, 144 hours

Chapter	Types of activities					Total in hours
	Lectures	Practical work	Laboratory work	Seminar	Independent studies	
Information support of the product life cycle	8	-	21	16	16	61
Analysis of software systems to provide information support to the various stages of the product life cycle	5	-	16	10	10	42
Analysis of software systems and data formats that integrate software systems into a single information space products	4	-	14	12	12	41
Total:	17	-	51	38	38	144

Lectures

Hours	Theme
3	Life cycle of optical products. Features of the design stage of optical products
3	Information support of the product life cycle. Concept, strategy, technology and information systems for the product life cycle support.
2	Architecture and structure of the information support system of the product lifecycle
2	Research activities. Networking technologies in optical engineering. The study of actual problems of optical engineering.
2	Computer-aided design and simulation of optics. CAD/CAE/CAM.
2	Material Requirements Planning (MRP), Enterprise Resource Planning (ERP), Workflow Management (WF)
2	Product Data Management (PDM), Product Lifecycle Management (PLM).
1	Formats for the exchange of product data. Information security.

Laboratory work

Hours	Theme
7	Life cycle of the product. Development of explanatory notes.
7	Life cycle of the product. Design of the optical system of the product.

7	Life cycle of the product. Development of the design documentation in the CAD environment.
6	Support product lifecycle in computer CAD programmes (SolidWorks).
5	Support product lifecycle in computer CAD programmes (TFlex).
5	Support product lifecycle in computer CAD programmes (Autodesk Inventor).
14	Integration of programs into a common information space of the product.

Independent studies

- Preparing for laboratory works
- Writing reports
- Home work

Assessment Methods

- Test;
- Laboratory work;
- Home tasks
- Personal skills of a student are estimated;
- Exam