**COURSE DESCRIPTION CARD - SYLLABUS**

Course name
   Elements of Optronics
**Course**

Field of study
 Mechanical Engineering, Mechatronics
Area of study (specialization)

Level of study

Form of study

Year/Semester

Profile of study

Course offered in

Requirements

 **Number of hours**

Lecture

Tutorials

Laboratory classes
 10?
Projects/seminars
  5?
Other (e.g. online)

**Number of credit points**   6

**Lecturers**

Responsible for the course/lecturer:
Prof. Ewa Stachowska

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Faculty of Mechanical Engineering

Responsible for the course/lecturer:

 **Prerequisites**
Knowledge: Basic knowledge of physics and engineering acquired during the 1st and 2nd degree studies.

**Course objective**
 Introduction to optoelectronics, laser technology, interferometry, holography and fiberoptics.

**Course-related learning outcomes**Knowledge
To learn the construction, operation and application of optoelectronic elements and to select the appropriate ones to use in a technical application.

Basic knowledge of optical techniques and fiber optics, interferometry, holography and shearography [K\_W02, K-W017]

Knowledge of opto-electronic and opto-mechanical elements and set-ups [K\_W02, K\_W017]

Knowledge of new directions in opto-mechatronics in modern industry [K\_W17]

Skills
1. Ability to test opto-mechanical elements in an experimental set-up [K\_U008]

2. Ability to correctly and savely    use opto-mechatronic devices [K\_U020, K\_U021]

3.  Ability to design complex opto-mechatronic systems for technical applications    [ K\_U020]

Social competences
1. Understanding the need for lifelong learning; ability to inspire and organize the learning process of others - [K\_K01]

2. Being aware of and understanding the validity of non-technical aspects and effects of engineering activities, including the impact on the environment and responsibility for decisions. - [K\_K02]

3. Ability to interact and work in a group, taking up different roles - [K\_K03]

4. Ability to think and act in a creative and enterprising way - [K\_K06]

**Methods for verifying learning outcomes and assessment criteria**Learning outcomes presented above are verified as follows:

**Programme content**

principles of laser radiation properties, optomechanical elements and set-ups, interferometers,  non-destructive optical test methods using laser holographic microscope, vibrometer and shearograph.

**Teaching methods**

Workshop methods of practical excercises

**Bibliography**

Basic
1. E. Hecht, Optics, Fourth Edition, Pearson Education, Inc, 2002

2. K.M. Boot, S.L.Hill, The Essence of Optoelectronics, Prentice Hall UK 1998

Additional
1. P. Hariharan, Optical Holography; Principles, Techniques and Applications, Cambridge University Press, 2nd edition, Cambridge 2008

2. M. Born, E.Wolf, Principles of Optics, Pergamon    Press, 1970

**Breakdown of average student's workload**

|  | Hours | ECTS |
| --- | --- | --- |
| Total workload | 150 | 6 |
| Classes requiring direct contact with the teacher | 15 |   1  |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [[1]](#footnote-1) | 135 | 5,0 |

1. delete or add other activities as appropriate [↑](#footnote-ref-1)