



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Methodology of Science for Engineers

Course

Field of study

Automatic Control and Robotics

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

elective

Number of hours

Lecture

30

Tutorials

Laboratory classes

Projects/seminars

Other (e.g. online)

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr. Radosław Kot

Responsible for the course/lecturer:

email: radoslaw.kot@put.poznan.pl

Prerequisites

The student has basic knowledge of history and culture; can choose the appropriate sources of knowledge and obtain the necessary information from them and provide a critical analysis and evaluation of solutions for complex and unusual engineering problems; is aware of the need of deepening and expanding knowledge to solve newly born technical problems.



Course objective

Obtaining knowledge on scientific methodology, the results and limitations of practicing it.

Course-related learning outcomes

Knowledge

Has basic knowledge necessary to understand social and ethical, economic, legal and other non-technical conditions of engineering activity; understands the impact of social and civilizational changes on the lifestyle of society.

Skills

Is able to perceive the scientific aspects of a proper formulating and solving engineering problems, including environmental, economic and legal ones.

Social competences

Is aware of the level of his knowledge in relation to the conducted research in science and technology; is able to think and act in a creative and entrepreneurial way, taking into account the safety and ergonomics of work and its economic aspects, is aware of the need to initiate action for the public interest and of responsibility for the effects of the team and its participants work; understands and appreciates the importance of intellectual honesty in the actions of its own and other people; is ready to demonstrate reliability, impartiality, professionalism and ethical attitude; is aware of its social role as a graduate of a technical university, is ready to popularize scientific content to the society and to identify, when met, and resolve basic problems related to the field of study.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Forming grade:

By discussions and questions checking the degree of mastery of previously presented issues.

Final grade:

Final essay on an accepted previously topic.

Programme content

- Application of scientific methodology as a requirement for accepting any field of knowledge as a scientific one.
- Methodological basics: methodology of science and methodologies of specific fields.
- Basic concepts: hypothesis, theory, falsification.
- Scientific methodology as a cognitive tool and an engineer's work tool.
- Dynamics of changes in the methodology of science.
- Methodological discipline.



- Innovation and changes in methodology.
- Scientific thinking and colloquial thinking.
- Rules for sharing the results of the scientific work.
- Popularization of the results of scientific work.
- Practical problems of modern science: financing, industrial espionage, etc.
- Prospects for changes in science.

Teaching methods

Lecture, discussion with students and providing materials of educational importance available on the Web.

Bibliography

Basic

1. Apanowicz, J., Metodologia ogólna, Gdynia 2002

Additional

1. Kumar R., Research Methodology London 2011 [http://www.sociology.kpi.ua/wp-content/uploads/2014/06/Ranjit_Kumar-Research_Methodology_A_Step-by-Step_G.pdf]
2. Lem S., Summa Technologiae, Kraków 1996

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for tests) ¹	25	1,0

¹ delete or add other activities as appropriate