COURSE DESCRIPTION CARD - SYLLABUS

Course name
Preparation for carrying out scientific research [S1MiBP1>PdPBN]

Course

Field of study
Mechanical and Automotive Engineering

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

KNOWLEDGE: The student knows the basics of mathematics and statistics. SKILLS: The student knows how to use basic computer techniques. SOCIAL COMPETENCES: The student distinguishes between scientific and colloquial language.

Course objective

The aim of teaching the subject is to familiarize students with the basic concepts and assumptions of scientific research and to provide knowledge enabling participation in the planning and implementation of scientific research projects.

Course-related learning outcomes

Knowledge:
Has knowledge in the field of mathematics, including algebra, analysis, theory of differential equations, probability, analytical geometry necessary to: describe the operation of discrete mechanical systems, understand computer graphics methods, describe the operation of electrical and mechatronic systems. Can use integrated with the packages for spatial modeling, programs for the calculation of mechanical structures by the finite element method and correctly interpret their results.

Can use learned mathematical theories to create and analyze simple mathematical models of machines and their elements, and simple technical systems.

Skills:
Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.
Has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.
Can prepare and present a short verbal and multimedia presentation devoted to the results of an engineering task.

Social competences:
Is ready to critically assess his knowledge and received content
Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on its own.
Is willing to think and act in an entrepreneurial manner.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Assessment of activity in the classroom and a test.

Programme content

Classes include an overview of basic research methods and tools. During the course, the student becomes familiar with the research process, starting from the correct formulation of the research problem and hypotheses, through the creation of a research plan, appropriate sample selection, data collection, ending with data analysis, correct inference and compliance with copyright. The main thematic blocks are:
1. Methodology of scientific work. Basic definitions. Stages of scientific work. Scientific problem. Formulating and verifying scientific hypotheses.
2. Methods and techniques of scientific research.
3. Planning the experiment. Population and statistical sample.
4. Descriptive statistics. Location measures. Measures of volatility. Measures of asymmetry. Measures of interdependence. Point and interval estimation.
5. Data mining methods in technical sciences. Creating models based on research results. Cross-Industry Standard Process for Data Mining.

Course topics

none

Teaching methods

Wykład informacyjny i problemowy z prezentacją multimedialną oraz dyskusja dydaktyczna.

Bibliography

Basic
Kłos Z., Małdziński L., Wisłocki K.: Rozprawy naukowe. WPP, Poznań 2011
Leszek W., Wojciechowicz B.: Teorie, prawa i prawidłowości w nauce o eksploatacji obiektów technicznych. Wydawnictwo Instytutu Technologii Eksploatacji, Poznań-Radom 2006
Additional
Hajduk Z.: Ogólna metodologia nauk, Redakcja Wyd.KUL, Lublin 2005
Pabis S.: Metodologia i metody empirycznych. PWN, Warszawa 1985
Szymanek K.: Sztuka argumentacji. Słownik terminologiczny. Wydawnictwo Naukowe PWN, Warszawa 2001.

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50