COURSE DESCRIPTION CARD - SYLLABUS

Course name

Obtaining financing for research and research and development activities

Course

Field of study

automatic control and robotics

Year/Semester

1/1

Area of study (specialization)

intelligent control systems

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

15

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

Knowledge: Students starting this subject should have knowledge of automation and robotics corresponding to level 6 of the Polish Qualifications Framework.

Skills: The student should have the ability to solve basic problems in the field of automation and robotics as well as the ability to obtain information from specified sources. Student should also understand the need to expand his competences and be ready to cooperate in a team.

Social competences: In addition, in the area of social competences, the student must exhibit such qualities as honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

Course objective

1. To provide students with knowledge regarding the understanding of the economic, legal and social aspects of conducting and financing research and development activities.

2. Developing students' skills in obtaining funding for research and R&D, which is available through intermediary institutions (including NCN, NCBR).

3. Developing the importance of knowledge of standards and recommendations related to conducting and obtaining financing for R&D in students.

Course-related learning outcomes

Knowledge

1. The student has the knowledge necessary to understand the economic, legal and social aspects of engineering activities and the possibilities of their application in practice; [K2_W14]

2. has knowledge of running a business, engineering project management and quality management; [K2_W15]

3. knows the rules and procedures for creating individual entrepreneurship in automation and robotics; [K2_W17]

Skills

1. Student is able to analyze and interpret project technical documentation and use scientific literature related to a given problem; [K2_U2]

2. is able to communicate using various techniques in a professional environment and in other environments, including in a foreign language; [K2_U3]

3. is able to identify non-technical aspects, including environmental, economic and legal, when formulating and solving tasks involving the design of automation and robotics systems; [K2_U14]

4. is able to make a preliminary economic analysis of engineering activities undertaken; [K2_U18]

5. is able to manage the work of the team, can lead the team and is able to estimate the time needed to complete the task; can develop a work schedule and complete tasks ensuring deadlines are met; [K2_U24]

Social competences

1. The student is aware of the responsibility for their own work and readiness to comply with the principles of teamwork and taking responsibility for jointly implemented tasks; is able to lead a team, set goals and set priorities leading to the task; [K2_K3]

2. is ready to think and act in an entrepreneurial manner; [K2_K5]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:

a) in the scope of lectures:

based on homework assignments and answers to questions about the material discussed in previous lectures,

b) in the scope of the project:

based on assessment of knowledge and understanding of current issues presented in the course of the subject.

Summative rating:

a) in the scope of lectures, verification of assumed learning outcomes is carried out by:

i. assessment of knowledge and skills demonstrated at the written test in the form of a test

ii. discussion of passing results.

b) within the scope of the project, verification of assumed learning outcomes is carried out by:

i. assessment of student's preparation for individual tasks,

ii. continuous assessment, at every stage of project implementation - rewarding the increase in the ability to use known principles and methods,

iii. final evaluation of a project partly prepared during classes and also after their completion.

Obtaining additional points for activity during classes, in particular for:

i. independent preparation and submission of an application in a competition not provided for in the subject program,

ii. effectiveness of applying the acquired knowledge while solving a given problem,

iii. comments related to the improvement of teaching materials.

Programme content

The lecture program includes the following topics:

1. Institutions intermediating in financing science in Poland (NCN, NCBR, NAWA). Legal basis and amount of funding. Examples of projects that received support. Types of R&D works related to levels of technological readiness (basic research, industrial research, development works, pre-implementation works).

2. Project selection criteria - Purpose and adequacy of the scientific / technological problem - project result, conceptual and operational risk, novelty of project results.

3. Planning and stages of preparation of the grant application, taking into account university regulations.

4. Project selection criteria - R&D work plan and milestones, R&D team, technical resources as well as intangible and legal property.

5. Project selection criteria - cost eligibility and adequacy, types of costs.

6. Project selection criteria - market demand and implementation profitability, how to implement project results.

7. Formal criteria and access criteria (National Smart Specializations, management and project management, impact on the principle of sustainable development, intellectual property protection plan).

The design class program includes:

1. Analysis of open competitions. Preparation of the application in the current competition.

2. Determining the scientific / technological problem, its significance, determining the level of conceptual risk. Analysis of publication and patent databases.

3. Characteristics of the potential target market, characterization of direct and substitute competition. Outlining the features of the new solution and measurable advantages included in the technical parameters.

4. Preparation of the schedule and work plan aimed at developing the product / service in accordance with the technological readiness levels. Determination of milestones and their measurable parameters.

5. Selection of R&D staff, technical resources and intangible assets necessary for the proper implementation of the project.

6. Preparation of the project cost estimate. Eligibility and cost adequacy analysis.

7. Developing the implementation plan and analyzing the profitability of implementing project results.

Teaching methods

1. Lecture: presentation and discussion of source data, multimedia presentation illustrated with literature data

2. Project classes: familiarizing with the requirements of the current competition of the selected intermediate body, iterative preparation of the application for funding in the current competition, taking into account the requirements of the competition

Bibliography

Basic

1. Podręcznik Frascati, Pomiar działalności naukowo-technicznej i innowacyjnej, OECD, 2015 (online) https://doi.org/10.1787/9788388718977-pl

2. Poradnik wnioskodawcy, NCBR, 2019 (online) https://www.ncbr.gov.pl/fileadmin/user_upload/Poradniki/NCB_188_Poradnik_wnioskodawcy_publikacja_PL_v4.pdf [2020-04]

3. Competition documentation of the selected open competition NCN, NCBR (online)

4. Ustawa z dnia 30 kwietnia 2010 r. o Narodowym Centrum Badań i Rozwoju (online in Internetowym Systemie Aktów Prawnych)

5. Ustawa z dnia 30 kwietnia 2010 r. o Narodowym Centrum Nauki (online in Internetowym Systemie Aktów Prawnych)

6. Ustawa z dnia 20 lipca 2018 r. - Prawo o szkolnictwie wyższym i nauce (online in Internetowym Systemie Aktów Prawnych)

7. Poznań University of Technology regulations regarding R&D works

Additional

1. Badania-rozwój-innowacje, NCBR, 2017 (dostęp online) https://www.ncbr.gov.pl/fileadmin/user_upload/bri_publikacja.pdf [2020-04]

2. Komercjalizacja B+R dla praktyków, NCBR, 2016 (dostęp online) https://www.ncbr.gov.pl/fileadmin/user_upload/import/tt_content/files/komercjalizacja_2016.pdf [2020-04]

3. Guidebooks of intermediate bodies (online). Example https://www.ncbr.gov.pl/o-centrum/publikacje/poradniki/ [2020-04]

4. Information brochures of intermediate bodies.

5. Łuczak D., Janik T., patent nr PAT.225406, „Termoanemometr jednokierunkowy wyznaczający zwrot", o udzieleniu patentu ogłoszono: 28.04.2017 WUP 04/17.

6. Łuczak D., Janik T., patent nr PAT.224740, „Termoanemometr", o udzieleniu patentu ogłoszono: 31.01.2017 WUP 01/17

7. Brock S., Łuczak D., Pajchrowski T., „Zespół mechaniczny zwłaszcza do testowania napędów bezpośrednich w szczególności odpornych układów sterowania napędów bezpośrednich", patent nr PAT.222240, o udzieleniu patentu ogłoszono: 29.07.2016 WUP 07/16.

8. Łuczak D., projekt preludium NCN pt. Control of electric drives with complex mechanical structure, 2016

Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for project classes, preparation for tests, project preparation) [1]	60	2,0

[1] delete or add other activities as appropriate