POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Drone applications

Course

Field of study	Year/Semester
Aviation	3/6
Area of study (specialization)	Profile of study
Unmanned Aerial Vehicle	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	30	0
Tutorials	Projects/seminars	
0	0	

Number of credit points

6

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Wojciech Giernacki

wojciech.giernacki@put.poznan.pl

tel. 61 665 23 77

Wydział Automatyki, Robotyki i Elektrotechniki

Piotrowo 3a, 60-965 Poznań

Responsible for the course/lecturer:

dr inż. Stanisław Gardecki

Stanislaw.gardecki@put.poznan.pl

tel. 61 665 28 85

Wydział Automatyki, Robotyki i Elektrotechniki

Piotrowo 3a, 60-965 Poznań

Prerequisites

Knowledge: Basic knowledge of mathematical analysis, programming languages.

Skills: Have basic skills in using software supporting design, as well as efficiently obtain additional information from various sources.

Social competence: understands the need to improve one's qualifications and is ready to work in a team.

Course objective

Familiarization with the structure and optimization of applications controlling unmanned flying objects.

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Course-related learning outcomes

Knowledge

1. has ordered, theoretically founded general knowledge covering key issues in the field of technical thermodynamics, fluid mechanics, in particular aerodynamics

2. has an ordered, theoretically founded knowledge in the field of engineering graphics and machine construction: technical drawing, object projection, basic principles of engineering graphics, the use of CAD (Computer Aided Design) graphic programs in the construction of machines

Skills

1. can analyze the strategies of enterprises and interpret their activities, and can use in practice the basic tools of strategic analysis

2. is able to design elements of means of transport with the use of data on environmental protection

3. is able to estimate various types of costs, is able to verify and assess market phenomena, is able to assess the factors of economic growth and the importance of money for its development, is able to decide about economic choices in the field of consumption and production

Social competences

1. is aware of the importance of knowledge in solving engineering problems and knows examples and understands the causes of faulty engineering projects that have led to serious financial and social losses, or to a serious loss of health and even life

2. correctly identifies and resolves dilemmas related to the profession of an aerospace engineer

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture

Assessment of knowledge and skills demonstrated in a written test of a test and accounting nature (the written test sheet contains information necessary to perform accounting tasks). Test passing threshold 50%. Rewarding grades from laboratory classes as well as attendance and activity during the lecture.

Laboratories

Evaluation of reports from individual exercises and final colloquium.

Programme content

1. Control architectures of multi-rotor UAVs

2. Mathematical models of multi-rotor UAVs

3. Selected estimation methods and multi-rotor UAVs

4. Low level control

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5. High-level control - selected methods of synthesis of UAV position and orientation tracking systems

6. Flight control systems for a group of flying robots

Teaching methods

Information lecture (conventional) (transmission of information in a systematic way) - can be of a course (propedeutic) or monographic (specialist) nature.

Laboratory exercises in the form of practical tasks

Bibliography

Basic

1. W. Giernacki: Drony i bezzałogowe statki powietrzne (UAV), Wydawnictwo Politechniki Poznańskiej, 2018.

Additional

1. W. Wyszywacz: Drony, Wydawnictwo Poligraf 2020.

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	60	2,5
Student's own work (literature studies, preparation for classes, preparation for tests,) [1]	90	3,5

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[1] delete or add other activities as appropriate