STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Flying robots		**1010331161010339600**

Field of study	Profile of study (general academic, practical)	Year /Semester
Automatic Control and Robotics	**general academic**	**3 / 6**

Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Robotics	**Polish**	**elective**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **30** Classes: **-** Laboratory: **30** Project/seminars: **-**	**5**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
major	**from field**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**100 5%**
Technical sciences	**100 5%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	K1_W05 [P6S_WG]: The graduate knows and understands in advanced level the methods of signal processing in the time and frequency domain. K1_W06 [P6S_WG]: Knows and understands to an advanced level the theory of linear dynamic systems, including selected methods of modelling and stability theory. K1_W17 [P6S_WG]: The graduate knows and understands to an advanced level the basic criteria of synthesis and tuning methods of regulators.
2	**Skills**	K1_U01[P6S_UU]: Is able to obtain information from literature, databases and other sources; has the ability to self-educate in order to improve and update professional competences. K1_U04 [P6S_UK]: Can use a foreign language at B2 level of the Common European Framework of Reference for Languages, sufficient for communication, as well as reading with an understanding of catalogue cards, application notes, user manuals and descriptions of IT tools.
3	**Social competencies**	K1_K02[P6S_KR]: The graduate is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions taken. The graduate is ready to take care of the achievements and traditions of the profession.

Assumptions and objectives of the course:

- The aim of the course is to familiarize students with current solutions in the field of flying robots.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Can read with understanding the technical design documentation and simple technological diagrams of automation and robotics systems - [K_W16 (P6S_WG)]

2. The graduate is familiar with the current state and the latest development trends in the field of automation and robotics. The graduate knows and understands the fundamental dilemmas of modern civilization connected with the development of automation and robotics - [K1_W21 (P6S_WG)]

Skills:

1. The graduate is able to select the type and parameters of the actuator system, measurement system, control unit and peripheral and communication modules for the selected application and to integrate them in the form of the final measurement and control system. - [K1_U17 (P6S_UW)]

2. The graduate is able to determine and use models of simple electromechanical systems and selected industrial processes, as well as to use them for the analysis and design of automation and robotics systems. - [K1_U05 (P6S_UW)]

Social competencies:
1. The graduate is aware of the need for a professional approach to technical issues, meticulous familiarization with the documentation and environmental conditions in which the equipment and its components can operate. The graduate is ready to observe the rules of professional ethics and to demand it from others, to respect the diversity of opinions and cultures. - [K1_K04 (P6S_KR)]

Assessment methods of study outcomes
-Lecture: written exam (verification of theoretical knowledge) in the field of program content. Laboratories: checking practical skills in the implementation of various algorithms for determining the platform's orientation
Course description
-Lecture with multimedia presentation (including: drawings, photos, animations, sound, films) supplemented with examples given on the board. During the lecture initiating the discussion. Program contents: Getting acquainted with the construction, principle of operation of multicopter flying platforms and legal regulations accompanying it

Basic bibliography:

1. Drony-teoria i praktyka, Bartkiewicz Bartosz , Kruszewski Patryk , Szczepkowski Marek, Kabe 2016
2. Drony dla pocz ˛atkuj ˛acych. Konstrukcja i dostosowanie własnego quadcoptera, Ty Audronis, Packt, 2014

Additional bibliography:

1. Drony dla pocz ˛atkuj ˛acych. Konstrukcja i dostosowanie własnego quadcoptera, Kilby Terry, Kilby Belinda, APN Promise, 2008

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Participation in laboratory	30
3. Participation in consultations on the lecture	4
4. Participation in consultations concerning the laboratory	8
5. Exam	2

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	60	2
Practical activities	45	3