

DESCRIPTION OF THE PROGRAM OF STUDIES

Main field of study: **Control Engineering and Robotics** Specialization: **Embedded Robotics (AER)**

profile: **general academic** Level of studies: **2nd level, MS degree studies** Form of studies: **intramural**

1 General description

<p><i>1.1 Number of semesters:</i> 3</p>	<p><i>1.2 Total number of ECTS points necessary to complete studies at a given level:</i> 90</p>
<p><i>1.3 Total number of hours:</i> 1050</p>	<p><i>1.4 Prerequisites (particularly for second-level studies):</i></p> <p>Candidates for master studies in the field of Automation and Robotics may recruit after obtaining at least the title of engineer in admitted fields of study, referred to the document „Conditions and procedure of recruitment for higher education at Wrocław University of Science and Technology” for a given academic year.</p>
<p><i>1.5 Upon completion of studies graduate obtains professional degree of:</i></p> <p>Master of Science in Engineering</p>	<p><i>1.6 Graduate profile, employability:</i></p> <p>Graduates of the second-level studies in Embedded Robotics specialization gain knowledge about the principles, methods and algorithms of computer engineering and robotics. The graduates are prepared to work in the field of analysis, design and construction of control systems and robotics. The specialist knowledge of Embedded Robotics graduates includes control methods and methods of robot motion and action planning. The specialist skills of these graduates concern the design of robots, robotic and robotized systems design, as well as the design of robot controllers, drive systems, environmental perception systems, human-robot interfaces, and various types of electronic systems. Graduates are also prepared for creative engineering activities in the field of industrial and service robotics, as well as for scientific and research work, including third-level (doctoral) studies. The studies in English provide the graduates with additional competences thanks to in-depth knowledge of terminology, literature, and the advantage of a master’s thesis written in English.</p>

<p><i>1.7 Possibility of continuing studies:</i></p> <p>doctoral school or postgraduate studies</p>	<p><i>1.8 Indicate connection with University's mission and its development strategy:</i></p> <p>The program of the studies is in line with the Development Plan of the Electronics Faculty adopted by the Faculty Council on February 22, 2012. The Faculty Development Plan is fully correlated with the mission of the university and its development strategy adopted by the Senate of Wrocław University of Science and Technology in 2011. These relationships are shown, for example, in point 3 of the Development Plan "Mission and Vision of the Faculty" and in point 4 of the Development Plan "Sector Models", where the Model of Education and the Model of Study, as well as the Model of Cooperation with the Environment taking into account the needs of the labor market and of building a network of influences were specified.</p>
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2 Detailed description

2.1 Total number of learning outcomes in the program of study: W (knowledge) = 10, U (skills) =11, K (competences) = 2, W + U + K = 23

2.2 For the main field of study assigned to more than one discipline - the number of learning outcomes assigned to the discipline:

not applicable

2.3 For the main field of study assigned to more than one discipline - percentage share of the number of ECTS points for each discipline:

not applicable

2.4a. For the general academic profile of the main field of study – the number of ECTS points assigned to the classes related to the University's academic activity in the discipline or disciplines to which the main field of study is assigned – DN (must be greater than 50% of the total number of ECTS points from 1.2) 74

2.4b. For the practical profile of the main field of study - the number of ECTS points assigned to the classes shaping practical skills (must be greater than 50% of the total number of ECTS points from 1.2)

not applicable

2.5 Concise analysis of compliance of the assumed learning outcomes with the needs of the labor market

The labor market for graduates of engineering studies in the field of Automation and Robotics covers the entire country, the Lower Silesian Region and Wrocław. The program of studies in this field includes all the most important needs and requirements of the labor market for automation engineers, robotics and IT specialists. The profile of companies that will benefit from the competences of the graduates of this field of study are primarily integrator, service and production companies. In this respect, there is and there will be a significant demand for specialists with the title of engineer, who have the skills to integrate automation devices and systems, create software for PLC, PAC, SCADA systems and robotic systems, carry out commissioning and start-up of control systems, local and remote service and supervision of production control systems. Also, the ability to design widely understood control,

telemetry and measurement systems will be very positively received on the labor market. There is also a significant increase in the number of companies that automate buildings and intelligent houses, and then these facilities require constant maintenance by automation engineers. A significant number of small and medium-sized enterprises and production plants operate in the Lower Silesia Region, where the engineering skills have been recognized and will be recognized over the next many years. The job market demand for graduates is also evidenced by the inclusion of automation and robotics on the list of courses ordered by the Ministry of Science and Higher Education

2.6. The total number of ECTS points that a student must obtain in classes requiring direct participation of academic teachers or other persons conducting classes and students (enter the sum of ECTS points for courses / groups of courses marked with the BU code) 59,5 ECTS

2.7. Total number of ECTS points, which student has to obtain from basic sciences classes

Number of ECTS points for obligatory subjects	4
Number of ECTS points for optional subjects	0
Total number of ECTS points	4

2.8. Total number of ECTS points, which student has to obtain from practical classes, including project and laboratory classes (enter total number of ECTS points for courses/group of courses denoted with code P)

Number of ECTS points for obligatory subjects	35,5
Number of ECTS points for optional subjects	15,5
Total number of ECTS points	51

2.9. Minimum number of ECTS points, which student has to obtain doing education blocks offered as part of University-wide classes or other main field of study (enter number of ECTS points for courses/groups of courses denoted with code O) 0 ECTS points

2.10. Total number of ECTS points, which student may obtain doing optional blocks (min. 30% of total number of ECTS points) 54 ECTS points

3 Description of the process leading to learning outcomes acquisition:

The process of reaching the planned learning effects is multi-stage and multi-faceted:

- At the enrollment stage, the aim is to admit only students with a high recruitment rate, i.e., well prepared in secondary schools for university studies.
- During the first year of studies, the curriculum provides for the acquisition of reliable basic knowledge (mathematics, physics, computer science), which will facilitate the achievement of learning outcomes in the following years.
- Basic courses and auxiliary courses are combined into groups of courses (accounting, laboratory, design exercises) that allow to verify students' knowledge in practical applications.
- Thanks to the good equipment of libraries and the provision of teaching materials to students by teachers, there is a possibility of early and systematic preparation for classes.
- The high technical level of equipment in lecture halls and laboratories facilitates the acquisition of knowledge and skills by students.

- The process of achieving learning effects is subject to continuous verification of the acquired knowledge and skills during auxiliary courses, seminars, colloquiums and exams (including the diploma examination).

4 List of education blocks:

4.1 List of obligatory blocks:

4.1.1 List of general education blocks

4.1.1.1. Liberal-managerial subjects block : ECTS points: 5

No.	Course /group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form ² of course /group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN ⁵ classes	BU ¹ classes			Univer-sity-wide ⁴	Concer-ning scien-tific activi-ties ⁵	Practi-cal ⁶	Type ⁷
1	FLEA00002S	Social Comm.					1	K2AIR_K01	15	60	2		1	T	Z	O			KO
2	ZMZO00387W	Entrepreneurship	1					K2AIR_W02	15	30	3		1	T	Z	O			PD
3	ZMZO00387S	Entrepreneurship					1	K2AIR_K02	15	60	0		1	T	Z	O		P(1)	PD
Total			1	0	0	0	2		45	150	5	0	3					P(1)	

4.1.1.2. Foreign languages block: ECTS points: 3

No.	Course /group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form ² of course /group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN ⁵ classes	BU ¹ classes			Univer-sity-wide ⁴	Concer-ning scien-tific activi-ties ⁵	Practi-cal ⁶	Type ⁷
1		Foreign language I		1				K2AIR_U01	15	30	1		1	T	Z	O		P(1)	PD
2		Foreign language (or Polish) II		3				K2AIR_U01	45	60	2		1	T	Z	O		P(1)	PD
Total			0	4	0	0	0		60	90	3	0	2					P(2)	

Grand total for general education blocks

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes ⁵	Number of ECTS points for BU classes ¹
lec	cl	lab	pr	sem					
1	4	0	0	2	105	240	8	0	5

¹BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

⁶Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁷KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

4.1.2 List of basic sciences blocks

4.1.2.1. Mathematics block

ECTS points: 3

No.	Course /group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form ² of course /group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN ⁵ classes	BU ¹ classes			Univer-sity-wide ⁴	Concer-ning scientific activities ⁵	Practi-cal ⁶	Type ⁷
1	AREA00006W	Applied Logic (GK)	1					K2AIR.W01	15	30	3		3	T	Z				S
2	AREA00006C	Applied Logic (GK)		1				K2AIR.U01	15	60	0		0	T	Z			P(1)	S
Total			1	1	0	0	0		30	90	3	0	3					P(1)	

4.1.2.2. Physics block

ECTS points: 1

No.	Course /group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form ² of course /group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN ⁵ classes	BU ¹ classes			Univer-sity-wide ⁴	Concer-ning scientific activities ⁵	Practi-cal ⁶	Type ⁷
1	FZP004901W	Physics	1					K2AIR.W01	15	30	1		0,5	T	Z	O			PD
Total			1	0	0	0	0		15	30	1	0	0,5					P(0)	

Grand total for basic sciences blocks:

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes ⁵	Number of ECTS points for BU classes ¹
lec	cl	lab	pr	sem					
2	1	0	0	0	45	120	4	0	3,5

¹BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

⁶Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁷KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

4.1.3 List of the main field of study blocks

4.1.3.1. Obligatory main field of study blocks

ECTS points: 19

No.	Course /group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form ² of course /group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN ⁵ classes	BU ¹ classes			University-wide ⁴	Concerning scientific activities ⁵	Practical ⁶	Type ⁷
1	AREA00007W	Control Theory (GK)	2					K2AIR_W03	30	60	6	6	2	T	E(w)		DN		K
2	AREA00007C	Control Theory (GK)		2				K2AIR_U03	30	60	0		2	T	Z			P(2)	K
3	AREA00007L	Control Theory (GK)			1			K2AIR_U03	15	60	0		1	T	Z			P(2)	K
4	AREA17002W	Mathematical Methods of Automation and Robotics (GK)	2					K2AIR_W05	30	60	5	5	2	T	E(w)		DN		K
5	AREA17002C	Mathematical Methods of Automation and Robotics (GK)		2				K2AIR_U05	30	90			3	T	Z			P(3)	K
6	AREA15004W	Modeling and Identification (GK)	2					K2AIR_W04	30	75	5	5	1	T	Z		DN		K
7	AREA15004L	Modeling and Identification (GK)			2			K2AIR_U04	30	75	0		2	T	Z			P(2)	K
8	AREA00118W	Theory and Methods of Optimization (GK)	1					K2AIR_W03	15	45	3	3	1	T	Z		DN		S
9	AREA00118C	Theory and Methods of Optimization (GK)		1				K2AIR_U03	15	45	0		1	T	Z			P(1)	S
Total			7	5	3	0	0		225	570	19	19	15					P(10)	

Grand total (for main field of study blocks):

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes ⁵	Number of ECTS points for BU classes ¹
lec	cl	lab	pr	sem					
7	5	3	0	0	225	570	19	19	15

¹BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

⁶Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁷KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

4.2 List of optional blocks

4.2.1 List of general education blocks

4.2.1.1. Foreign languages block (min. *BD* pkt ECTS):

ECTS points: 3

No.	Course /group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form ² of course /group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN ⁵ classes	BU ¹ classes			Univer-sity-wide ⁴	Concer-ning scien-tific activi-ties ⁵	Practi-cal ⁶	Type ⁷
1		Foreign language I		1				K2AIR_U01	15	30	1		1	T	Z	O		P(1)	PD
2		Foreign language (or Polish) II		3				K2AIR_U01	45	60	2		1	T	Z	O		P(1)	PD
Total			0	4	0	0	0		60	90	3	0	2					P(2)	

Grand total for general education blocks:

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes ⁵	Number of ECTS points for BU classes ¹
lec	cl	lab	pr	sem					
0	4	0	0	0	60	90	3	0	2

¹BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

⁶Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁷KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

4.2.2 List of basic sciences blocks

4.2.3 List of main field of study blocks

¹BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

⁶Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁷KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

4.2.4 List of specialization blocks

4.2.4.1. Specialization subjects (e.g. whole specialization) blocks (min. *BD* pkt ECTS):

ECTS points: 44

No.	Course /group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form ² of course /group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN ⁵ classes	BU ¹ classes			Univer- sity- wide ⁴	Concer- ning scientific activities ⁵	Practi- cal ⁶	Type ⁷
1	AREA00116W	Embedded Systems (GK)	2					S2AER.W02	30	60	5	5	1	T	Z		DN		S
2	AREA00116L	Embedded Systems (GK)			2			S2AER.U02	30	60	0		1	T	Z			P (1,5)	S
3	AREA00106W	Artificial Intelligence and Machine Learning (GK)	2					S2AER.W03	30	60	5	5	2	T	Z		DN		S
4	AREA00106P	Artificial Intelligence and Machine Learning (GK)				2		S2AER.U03	30	60	0		3	T	Z			P(3)	S
5	AREA00103W	Robotic Programming Environments (GK)	1					S2AER.W05	15	30	4		0,5	T	Z				S
6	AREA00103L	Robotic Programming Environments (GK)			2			S2AER.U05	30	60	0		2	T	Z			P(2)	S
7	AREA17105W	Event-based control (GK)	2					S2AER.W05	30	60	5	5	1	T	E(w)		DN		S
8	AREA17105P	Event-based control (GK)				2		S2AER.U05	30	60	0		2	T	Z			P(2)	S
9	AREA00117W	Sensors and Actuators (GK)	1					S2AER.W02	15	30	3	3	1	T	Z		DN		S
10	AREA00117L	Sensors and Actuators (GK)			1			S2AER.U02	15	30	0		2	T	Z			P(2)	S
11	AREA00121W	Control Theory for Embedded Systems (GK)	1					S2AER.W01	15	30	3	3	1	T	E(w)		DN		S
12	AREA00121L	Control Theory for Embedded Systems (GK)			1			S2AER.U01	15	30	0		1	T	Z			P(1,5)	S
13	AREA00122W	Mobile Robotics 1 (GK)	1					S2AER.W04	15	30	2	2	1	T	Z		DN		S
14	AREA00122L	Mobile Robotics 1 (GK)			1			S2AER.U04	15	30	0		1	T	Z			P (1)	S
15	AREA17107P	Intermediate Project				2		S2AER.U01	30	60	3	3	1,5	T	Z		DN	P(2)	S
16	AREA00108S	Specialization Seminar					2	K2AIR.U06	30	60	2	2	1	T	Z		DN	P (2)	S
17	AREA00123L	Mobile Robotics 2 (GK)			1			S2AER.U04	15	30	1	1	1	T	Z		DN	P (1)	S
18	AREA00124W	Advanced Robot Control (GK)	1					S2AER.W01	15	30	2	2	1	T	Z		DN		S
19	AREA00124L	Advanced Robot Control (GK)			1			S2AER.U01	15	30	0		1	T	Z			P (1)	S
20	AREA00113W	Task and Motion Planning (GK)	2					S2AER.W04	30	60	3	3	1	T	Z		DN		S
21	AREA00113S	Task and Motion Planning (GK)				1		S2AER.U04	15	30	0		0,5	T	Z			P (1)	S
22	AREA00120W	Social Robots (GK)	1					S2AER.W03	15	30	3	3	0,5	T	Z		DN		S
23	AREA00120L	Social Robots (GK)			1			S2AER.U03	15	30	0		1,5	T	Z			P(2)	S
24	AREA00109S	Diploma seminar				2		K2AIR.U06	30	60	3	3	1,5	T	Z		DN	P (3)	S
Total			14	0	10	6	5		525	1050	44	40	30					P(25)	

Grand total for specialization blocks:

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes ⁵	Number of ECTS points for BU classes ¹
lec	cl	lab	pr	sem					
14	0	10	6	5	525	1050	44	40	30

¹BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

⁶Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁷KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

4.3 Training block - concerning principles of training crediting

not applicable

4.4 „Diploma dissertation” block (if it is foreseen at first level studies)

Type of diploma dissertation: Master of Science		
Number of diploma dissertation semesters	Number of ECTS points	Code
1	15 P(10)	AREA15110
Character of diploma dissertation: research and development		
Number of BU ¹ ECTS points	7	

5 Ways of verifying assumed learning outcomes

Type of classes	Ways of verifying assumed learning outcomes
lecture	oral or written test, final test, choice test, examination, written examination, oral questioning, quiz, active participation in lectures, final written examination, general test
exercise	cumulative grade for control papers, cumulative grade for homework assignments, evaluation of class work, final test grade
laboratory	evaluation of preparation for laboratory classes and their execution, reports on laboratory exercises, activity in laboratory classes, evaluation of the written reports from the laboratory, observation based assessment of activity and performance on the exercise, assessment of the degree of execution of laboratory exercises, e-learning tests, oral answers
project	analysis of the project task implementation, written documentation of the project, presentation of assumptions and final solution, presentation of the results of project implementation along with their discussion and conclusions, evaluation of project preparation, project defense, participation in problem discussions, evaluation of completed project tasks, evaluation of the written report on the project, evaluation of the presentation of the subsequent stages of the project, compliance with the schedule, team activity, creative attitude, assessment of the quality of the documentation prepared, assessment of the components of the project and its final form, oral answers
seminar	evaluation of seminar presentation, active participation in discussion, evaluation of presentation preparation, participation in problem discussions, activity in seminar classes, evaluation of the quality of multimedia presentations, adherence to the schedule, evaluation of summary presentations and a written study
diploma thesis	acceptance of the diploma thesis

6 Range of diploma examination

Zagadnienia specjalnościowe

1. Robotic programming frameworks - distributed system design.
2. Formalisms for modeling Discrete Event Systems.
3. Event-driven control. Concept, problems, application examples.
4. Programming environments, debugging tools and techniques used for embedded systems.
5. Describe microcontroller peripherals useful in embedded systems for robots.
6. Methods for mobile robot localization and mapping.
7. Present two selected methods of motion planning usable in low and high dimensional state spaces.
8. Design issues unique to socially interactive robots.
9. Probabilistic knowledge representation and methods for making decisions.
10. Inductive machine learning algorithms.
11. Accelerometers and gyroscopes: types and principles of operation.
12. Robustness of adaptive control systems, deployment of formally described control strategies to embedded controllers through automatic code generation

Zagadnienia kierunkowe

1. Computer modeling of random variables.
2. Parametric and non-parametric approach to system identification.
3. Goals, tasks, and methods of optimization.
4. Use of modal logic (LTL) and Büchi automata in automatic verification.
5. Normal forms of representations of dynamic systems and control systems.
6. The feedback in linear and nonlinear systems.
7. Pole placement, linear quadratic and H-infinity control problems.
8. Discuss the tools and methods of solving the problem of optimal control.

7 Requirements concerning deadlines for crediting courses/groups of courses for all courses in particular blocks

no requirements

8 Plan of studies (attachment no. 3)

Approved by faculty student government legislative body:

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Date

.....
name and surname, signature of student representative

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Date

.....
Dean's signature