

# PLAN OF REGULAR STUDIES, GRADUATE PROGRAMME

**faculty: PHYSICS, speciality: COMPUTER PHYSICS**

REGULAR DAILY STUDIES – enrolment 2014/2015

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Subject	Summary figures		Curriculum in respective semesters (hours per week)								
	Including:		I		II		III		IV		
	H	pt.	H	pt.	H	pt.	H	pt.	H	pt.	
<b>A. GENERAL SUBJECTS</b>											
1 Physical education*	T	<b>30</b>	<b>1</b>					2	1		
2 Selective subject*		<b>30</b>	<b>2</b>					2	2		
<b>B BASIC SUBJECTS</b>											
3 Physics laboratory II	Lab	<b>105</b>	<b>13</b>	7	13						
<b>C. FIELD SUBJECTS</b>											
4 Theoretical physics	T	<b>60</b>		4	6						
5 Theoretical physics	L	<b>45</b>		<b>3</b>	5						
6 Solid state physics	T	<b>45</b>						3	5		
7 Solid state physics	L	<b>30</b>						<b>2</b>	3		
8 Quantum physics	T	<b>45</b>				3	5				
9 Quantum physics	L	<b>30</b>				<b>2</b>	3				
10 Nuclear and high energy physics	T	<b>30</b>						2	3		
11 Nuclear and high energy physics	L	<b>30</b>						<b>2</b>	3		
12 Introduction to atomic and molecular physics	T	<b>30</b>				2	4				
13 Introduction to atomic and molecular physics	L	<b>30</b>				<b>2</b>	3				
<b>D. SPECIALIZATION SUBJECTS**</b>											
14 Scientific programming in Python / Monte Carlo Methods	Lab	<b>30</b>		2	3						
15 Scientific programming in Python / Monte Carlo Methods	L	<b>30</b>		<b>2</b>	3						
16 Applications of computer simulations	Lab	<b>30</b>				2	3				
17 Applications of computer simulations	L	<b>30</b>				<b>2</b>	3				
18 Unix OS programming	Lab	<b>30</b>		3		2	3				
19 Symbolic programming in physical processes simulations	Lab	<b>30</b>		3		2	3				
20 Scripting languages in data analysis	Lab	<b>30</b>		3		2	3				
21 Internet applications programming	Lab	<b>30</b>		4				2	2		
22 Internet applications programming	L	<b>15</b>						<b>1</b>	2		
23 Quantum systems simulations	Lab	<b>30</b>								2	3
24 Quantum systems simulations	L	<b>30</b>								<b>2</b>	3
<b>ELECTIVE SUBJECTS***</b>											
25 Graduate seminar I	S	<b>30</b>	<b>4</b>					2	4		
26 Graduate seminar II	S	<b>30</b>	<b>4</b>							2	4
27 General seminar	S	<b>30</b>	<b>4</b>							2	4
28 Monographic lecture I	L	<b>30</b>	<b>5</b>					<b>2</b>	5		
29 Monographic lecture II	L	<b>30</b>	<b>4</b>							<b>2</b>	4
30 <b>MASTER'S THESIS</b>			<b>12</b>								<b>12</b>
31 <b>MAGISTER EXAMINATION</b>											<b>E</b>
<b>Sum:</b>		<b>1005</b>	<b>120</b>	<b>18</b>	<b>30</b>	<b>19</b>	<b>30</b>	<b>20</b>	<b>30</b>	<b>10</b>	<b>30</b>
<b>NUMBER OF EXAMINATIONS</b>				<b>2E</b>	<b>3E</b>	<b>4E</b>	<b>2E+</b>	<b>E</b>			

**Legend:** L - lecture, T - Tutorials, Lab - laboratory, Pr -practice, S – seminar  
 The lecture courses are closed with an examination  
 Tutorials, laboratories and seminars — **credit and mark**

Examination is made  
by a bold and underlined figure

H – hours per week  
pt. - ECTS

**Subjects:**

Graduate seminar I, II, General seminar — **credit and mark**.  
 Physical education - **credit without grade**.

\* - selective subjects,  
\*\* - specialty-related elective courses,  
\*\*\* - elective courses within specialty

**Selective subject\*:** Variety in unity in biological sciences, University-wide elective courses or from another field of study (min 30 hours) - **credit without grade**.

Plan studiów zatwierdzono na Radzie Wydziału w dniu 11 marca 2014 r.  
 Zmiany wprowadzono: 15 kwietnia 2014 r., 17.06.2014 r.

## PLAN OF REGULAR STUDIES, GRADUATE PROGRAMME

**faculty: PHYSICS, speciality: ENVIRONMENTAL PHYSICS**

REGULAR DAILY STUDIES – enrolment 2014/2015

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Subject	Summary figures		Curriculum in respective semesters (hours per week)							
	Including:		I		II		III		IV	
	H	pt.	H	pt.	H	pt.	H	pt.	H	pt.
<b>A. GENERAL SUBJECTS</b>										
1 Physical education*	T	30	1					2	1	
2 Selective subject*		30	2					2	2	
<b>B. BASIC SUBJECTS</b>										
3 Physics laboratory II	Lab	105	13	7	13					
<b>C. FIELD SUBJECTS</b>										
4 Theoretical physics	T	60		4	6					
5 Theoretical physics	L	45	11	3	5					
6 Solid state physics	T	45	8					3	5	
7 Solid state physics	L	30						2	3	
8 Quantum physics	T	45	8		3	5				
9 Quantum physics	L	30			2	3				
10 Nuclear and high energy physics	T	30						2	3	
11 Nuclear and high energy physics	L	30						2	3	
12 Introduction to the physics of atoms and particles	T	30			2	4				
13 Introduction to the physics of atoms and particles	L	30			2	3				
<b>D. SPECIALIZATION SUBJECTS**</b>										
14 Modern experimental physics	L	15	2	1	2					
15 Computer assistance for experiments	Lab	30	4	2	4					
16 Computational methods in environmental physics	T	30	3		2	3				
17 Computer simulations	Lab	30			2	4				
18 Computer simulations	L	30	7		2	3				
19 Environmental chemistry	Lab	15			1	2				
20 Environmental chemistry	L	30			2	3				
21 Advanced spectroscopic methods	T	30	4					2	2	
22 Advanced spectroscopic methods	L	15						1	2	
23 Antennas radiation	Lab	30	4							2
24 Antennas radiation	L	30								2
25 Ionizing radiation and radiological protection	L	30	2							2
<b>ELECTIVE SUBJECTS***</b>										
26 Graduate seminar I	S	30	4					2	4	
27 Graduate seminar II	S	30	4							2
28 General seminar	S	30	4							2
29 Monographic lecture I	L	30	5					2	5	
30 Monographic lecture II	L	30	4							2
31 MASTER'S THESIS			12							12
32 MAGISTER EXAMINATION										E
<b>Sum:</b>		<b>1005</b>	<b>120</b>	<b>17</b>	<b>30</b>	<b>18</b>	<b>30</b>	<b>20</b>	<b>30</b>	<b>12</b>
<b>NUMBER OF EXAMINATIONS</b>				<b>2E</b>	<b>4E</b>		<b>4E</b>		<b>2E+</b>	<b>E</b>

Legend: L - lecture, T - Tutorials, Lab - laboratory, Pr - practice, S – seminar  
 The lecture courses are closed with an examination  
 Tutorials, laboratories and seminars — **credit and mark**

**Subjects:**

General seminar, Graduate seminar I, II — **credit and mark**.  
 Ionizing radiation and radiological protection — **credit and mark**.  
**Selective subject\***: Variety in unity in biological sciences, University-wide elective courses or from another field of study (min 30 hours) - **credit without grade**.  
 Physical education - **credit without grade**.

Examination is made  
by a bold and underlined figure

H – hours per week  
pt. - ECTS

\* - selective subjects,  
\*\* - specialty-related elective courses,  
\*\*\* - elective courses within specialty

Plan studiów zatwierdzono na Radzie Wydziału w dniu 11 marca 2014 r.  
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## PLAN OF REGULAR STUDIES, GRADUATE PROGRAMME

faculty: PHYSICS, speciality: THEORETICAL PHYSICS

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REGULAR DAILY STUDIES – enrolment 2014/2015

Subject	Summary figures	Curriculum in respective semesters (hours per week)									
		Including:		I		II		III		IV	
		H	pt.	H	pt.	H	pt.	H	pt.	H	pt.
<b>A. GENERAL SUBJECTS</b>											
1 Physical education*		30	1					2	1		
2 Selective subject*		30	2					2	2		
<b>B. BASIC SUBJECTS</b>											
3 Physics laboratory II	Lab	105	13	7	13						
<b>C. FIELD SUBJECTS</b>											
4 Theoretical physics	T	60		4	6						
5 Theoretical physics	L	45	11	<u>3</u>	5						
6 Solid state physics	T	45						3	5		
7 Solid state physics	L	30	8					<u>2</u>	3		
8 Quantum physics I	T	45			3	5					
9 Quantum physics I	L	30	8		<u>2</u>	3					
10 Nuclear and high energy physics	T	30						2	3		
11 Nuclear and high energy physics	L	30	6					<u>2</u>	3		
12 Introduction to the physics of atoms and particles	T	30			2	4					
13 Introduction to the physics of atoms and particles	L	30	7		<u>2</u>	3					
<b>D. SPECIALIZATION SUBJECTS*</b>											
14 Mathematical methods in physics	Lab	30		2	4						
15 Mathematical methods in physics	L	15	6	<u>1</u>	2						
16 Packages for symbolic computations	Lab	30	3		2	3					
17 Computer simulations	Lab	30			2	4					
18 Computer simulations	L	30	7		<u>2</u>	3					
19 Statistical physics	T	30			2	3					
20 Statistical physics	L	15	5		1	2					
21 Quantum physics II	T	30						2	2		
22 Quantum physics II	L	15	4					<u>1</u>	2		
23 Field theory	T	30								2	2
24 Field theory	L	30	4							<u>2</u>	2
25 Elementary particle physics	L	30	2							2	2
<b>ELECTIVE SUBJECTS**</b>											
26 Graduate seminar I	S	30	4					2	4		
27 Graduate seminar II	S	30	4							2	4
28 General seminar	S	30	4							2	4
29 Monographic lecture I	L	30	5					<u>2</u>	5		
30 Monographic lecture II	L	30	4							<u>2</u>	4
31 MASTER'S THESIS			12								12
32 MAGISTER EXAMINATION											E
<b>Sum:</b>		<b>1005</b>	<b>120</b>	<b>17</b>	<b>30</b>	<b>18</b>	<b>30</b>	<b>20</b>	<b>30</b>	<b>12</b>	<b>30</b>
<b>NUMBER OF EXAMINATIONS</b>				<b>2E</b>		<b>3E</b>		<b>4E</b>		<b>2E+</b>	<b>E</b>

**Legend:** L - lecture, T - Tutorials, Lab - laboratory, Pr -practice, S – seminar

The lecture courses are closed with an **examination**

Tutorials, laboratories and seminars — **credit and mark**

**Subjects:**

General seminar, Graduate seminar I, II — **credit and mark.**

**Lectures:** Statistical physics, Elementary particle physics - **credit and mark**

**Selective subject\*:** Variety in unity in biological sciences, University-wide elective courses or from another field of study (min 30 hours) - **credit without grade.**

Physical education - **credit without grade.**

Examination is made by a bold and underlined figure

H – hours per week

pt. - ECTS

\* - selective subjects,  
\*\* - specialty-related elective courses,  
\*\*\* - elective courses within specialty

Plan studiów zatwierdzono na Radzie Wydziału w dniu 11 marca 2014 r.

Zmiany wprowadzono: 15 kwietnia 2014 r., 17.06.2014 r.

## PLAN OF REGULAR STUDIES, GRADUATE PROGRAMME

**faculty: PHYSICS, speciality: COMPUTER ASTROPHYSICS**

REGULAR DAILY STUDIES – enrolment 2014/2015

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Subject		figures		(hours per week)							
		Including:		I		II		III		IV	
		H	pt.	H	pt.	H	pt.	H	pt.	H	pt.
<b>A. GENERAL SUBJECTS</b>											
1	Physical education*	<b>30</b>	<b>1</b>					2	1		
2	Selective subject*	<b>30</b>	<b>2</b>					2	2		
<b>B. BASIC SUBJECTS</b>											
3	Physics laboratory II	<b>105</b>	<b>13</b>	7	13						
<b>C. FIELD SUBJECTS</b>											
4	Theoretical physics	<b>60</b>		4	6						
5	Theoretical physics	<b>45</b>	<b>11</b>	<b>3</b>	5						
6	Solid state physics	<b>45</b>						3	5		
7	Solid state physics	<b>30</b>	<b>8</b>					<u>2</u>	3		
8	Quantum physics	<b>45</b>				3	5				
9	Quantum physics	<b>30</b>	<b>8</b>			<u>2</u>	3				
10	Nuclear and high energy physics	<b>30</b>						2	3		
11	Nuclear and high energy physics	<b>30</b>						<u>2</u>	3		
12	Introduction to the physics of atoms and particles	<b>30</b>				2	4				
13	Introduction to the physics of atoms and particles	<b>30</b>				<u>2</u>	3				
<b>D. SPECIALIZATION SUBJECTS**</b>											
14	Astrophysics I	<b>30</b>		2	4						
15	Astrophysics I	<b>15</b>		<u>1</u>	2						
16	Astrophysics II	<b>30</b>				2	3				
17	Astrophysics II	<b>30</b>				<u>2</u>	3				
18	Extragalactic astronomy and cosmology	<b>15</b>				1	2				
19	Extragalactic astronomy and cosmology	<b>15</b>				1	2				
20	Astrophysics of compact objects	<b>30</b>								2	4
21	Astrophysics of compact objects	<b>15</b>								<u>1</u>	2
22	Modern radio astronomy	<b>30</b>		2				2	2		
23	High-energy astrophysics	<b>30</b>		2				<u>2</u>	2		
24	Radiative processes in astrophysics	<b>45</b>				3	3				
25	Radiative processes in astrophysics	<b>30</b>				<u>2</u>	2				
<b>ELECTIVE SUBJECTS***</b>											
26	Graduate seminar I	<b>30</b>		4				2	4		
27	Graduate seminar II	<b>30</b>		4						2	4
28	General seminar	<b>30</b>		4						2	4
29	Monographic lecture I	<b>30</b>		5				<u>2</u>	5		
30	Monographic lecture II	<b>30</b>		4						<u>2</u>	4
31	<b>MASTER'S THESIS</b>		<b>12</b>								12
32	<b>MAGISTER EXAMINATION</b>									<b>E</b>	
<b>Sum:</b>		<b>1005</b>	<b>120</b>	<b>17</b>	<b>30</b>	<b>20</b>	<b>30</b>	<b>21</b>	<b>30</b>	<b>9</b>	<b>30</b>
<b>NUMBER OF EXAMINATIONS</b>				<b>2E</b>	<b>4E</b>	<b>4E</b>	<b>4E</b>	<b>2E+</b>	<b>E</b>		

**Legend:** L - lecture, T - Tutorials, Lab - laboratory, Pr -practice, S – seminar  
 The lecture courses are closed with an examination  
 Tutorials, laboratories and seminars — **credit and mark**

**Subjects:**

General seminar, Graduate seminar I, II — **credit and mark**.  
 Extragalactic astronomy and cosmology, Modern radio astronomy — **credit and mark**.

**Selective subject\*:** Variety in unity in biological sciences, University-wide elective courses or from another field of study (min 30 hours) - **credit without grade**.  
 Physical education - **credit without grade**.

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