

PROGRAMME OF EDUCATION

FACULTY: ENVIRONMENTAL ENGINEERING

MAIN FIELD OF STUDY: ENVIRONMENTAL ENGINEERING

in area of technical sciences

EDUCATION LEVEL: 2nd level, MSc engineer

FORM OF STUDIES: full-time

PROFILE: general academic

SPECIALIZATION: ENVIRONMENTAL QUALITY MANAGEMENT (EQM)

LANGUAGE OF STUDY: English

Content:

1. Programme of studies – attachment no. 2
2. Plan of studies – attachment no. 3

Faculty Council Resolution of **07.07.2015**

In effect since **01.10.2015**

PROGRAMME OF STUDIES

1. Description

<i>Number of semesters: 3</i>	<i>Number ECTS points necessary to obtain qualifications: 90</i>
<p><i>Prerequisites (particularly for second-level studies):</i></p> <p>Diploma of the I level studies in: Environmental Engineering, Environmental Protection or related. Each application is assessed individually on its merits. If in doubt, please contact the Admission Officer. English: TOEFL - 550 points or IELTS - 6 points.</p>	<p><i>Upon completion of studies graduate obtains</i></p> <p><i>professional degree of: Master Engineer</i></p> <p><i>2nd level qualifications</i></p> <p>In order to receive the Master's degree, the graduates will be required to write a Master's thesis and pass the examination.</p>
<p><i>Possibility of continuing studies:</i></p> <p>Third-degree in Environmental Engineering and related fields.</p>	<p><i>Graduate profile, employability:</i></p> <p>The EQM graduates will obtain knowledge in environmental engineering and experience in environment protection technology. They will be prepared for solving problems in sustainable development and technology. They will be able to play the role of the leader of the team and to organize and run research debates. They will acquire the experience necessary for professional career at research units, industry and at universities or colleges. They will gain substantial international experience and will be acquainted with the circumstances and the environment of the prestigious laboratories. They will possess well above standard skills in communication.</p> <p>Job prospects: The graduate of EQM is able to design, maintain and</p>

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	operate the systems of air, water, wastewater treatment as well as waste management. He may work in the private sector, industry and governmental administration. The profile of the graduate is suitable for work at universities in research and development institutions.
<p><i>Indicate connection with University's mission and its development strategy:</i></p> <p>The mission of our University and our Faculty is to shape the creative and critical personalities of students and define the directions of development in science and technology. The education offered at our institution is strongly linked with scientific research and the needs of economy and is consistent with standards of the European Higher Education Area. The degrees awarded by Wrocław University of Technology and Faculty of Environmental Engineering are a symbol of high quality of education, confirmed by the National Accreditation Committee and the Accreditation Committee of Universities of Technology.</p>	

2. Fields of science and scientific disciplines to which educational effects apply:

Fields of science: technical science; scientific disciplines: environmental engineering.

3. Concise analysis of consistency between assumed educational effects and labour market needs

Graduates of this programme will have modern knowledge in the field of environmental engineering and experience in environment protection technology. They will be prepared to participate in solving one of the most important problems of global economy– sustainable development. Sustainable development is such a way of satisfying the needs of the current generation that the chances of the future generations to satisfy their needs will not be reduced. This is what maintaining the current level of our civilization development depends on. This is why protection of the natural environment is one of the main issues in the European Union politics. According to the report of the Ministry of Science and Higher Education, the largest difference between the need and the supply of technical studies graduates exists in specialisations related to environment protection. The market need for specialists in environment protection and environmental engineering makes 36% of the need for technical programmes.

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4. List of education modules:

4.1. List of obligatory modules:

4.1.1 List of general education modules

4.1.1.1 Liberal-managerial subjects module (min. 5 ECTS points):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	FLH071121W	Ethics of new and emerging technologies	1					K2IS_W03, K2IS_W09, K2IS_K02	15	30	2	1.0	T	Z	O		KO	Ob.
2	ZMZ000155	Strategic management	2					K2IS_W03, S2EQM_W08	30	90	3	1.0	T	Z	O		KO	Ob.
Total			3						45	120	5	2						

4.1.1.2 Foreign languages module (min. 3 ECTS points):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1		Polish language A1 (or English language C1+)		1				T2A_U01	15	30	1	0.5	T	Z	O	P	KO	Ob.
2		Polish language (or another language)		3				T2A_U01	45	60	2	1.5	T	Z	O	P	KO	Ob.
Total				4					60	90	3	2						

4.1.1.3 Sporting classes module (min. 1 ECTS point):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	WFW01000BK	Physical training		1				K2IS_K04	15	30	1	0.5	T	Z	O	P	KO	Ob.
Total				1					15	30	1	0.5						

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Altogether for general education modules

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
3	5				120	240	9	4.5

4.1.2 List of basic sciences modules

4.1.2.1 Mathematics module (min. 3 ECTS points):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ISS005006	Engineering applications of mathematical statistics	1					K2IS_W01	15	60	2	0.5	T	Z			PD	Ob
2	ISS005006	Engineering applications of mathematical statistics		1				K2IS_U01, K2IS_K01	15	30	1	0.5	T	Z		P	PD	Ob.
Total			1	1					30	90	3	1						

4.1.2.2 Chemistry module (min. 5 ECTS points):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ISS105051	Environmental chemistry	2					S2EQM_W01, S2EQM_W02, K2IS_K02	30	90	3	1.0	T	Z			PD	Ob
2	ISS105051	Environmental chemistry			1			S2EQM_U02, S2EQM_U04	15	60	2	0.5	T	Z		P	PD	Ob.
Total			2		1				45	150	5	1.5						

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Altogether for basic sciences modules:

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
3	1	1			75	240	8	2.5

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4.1.3 List of main-field-of-study modules

4.1.3.1 Obligatory main-field-of-study modules

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷	
1	ISS105052	Automation in environmental engineering			1			S2EQM_U03	15	60	2	0.5	T	Z			P	K	Ob
2	ISS005007	Environmental management	2					K2IS_W03, K2IS_W09, K2IS_K02	30	90	3	1	T	Z				K	Ob
3	GPA105723	Spatial planning	1					K2IS_W02, K2IS_W09, K2IS_K01, K2IS_K02	15	60	2	0.5	T	Z				K	Ob
4	ISS105029	Reliability of engineering systems	1					S2EQM_W07	15	60	2	0.5	T	Z				K	Ob
5	ISS105036	Organization of construction works	1					K2IS_W02, K2IS_W08	15	60	2	0.5	T	Z				K	Ob
6	ISS105058	Buildings regulations	2					K2IS_W02	30	60	2	1.0	T	Z				K	Ob
7	ISS105038	Renewable energy systems	1					K2IS_W07, K2IS_W09	15	60	2	0.5	T	Z				K	Ob
Total			8		1				135	450	15	4.5							

Altogether (for main-field-of-study modules):

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
8		1			135	450	15	4.5

4.2 List of optional modules

4.2.1 List of main-field-of-study modules

4.2.1.1 Elective subject module (min. 2 ECTS points)(choice of 1 course):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ISS50007BK	Air pollutants and their sources	1					K2IS_W09, S2EQM_W07	15	30	1	0.5	T	Z			K	W
2	ISS50007BK	Air pollutants and their sources			1			K2IS_U06, S2EQM_U02	15	30	1	0.5	T	Z		P	K	W
3	ISS50007BK	Modeling of water and sewage treatment processes	1					K2IS_W09, S2EQM_W02, K2IS_K01	15	30	1	0.5	T	Z			K	W
4	ISS50007BK	Modeling of water and sewage treatment processes			1			K2IS_U06, S2EQM_U02, K2IS_K01	15	30	1	0.5	T	Z		P	K	W
Total			1		1				30	60	2	1						

Altogether for main-field-of-study modules:

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
1		1			30	60	2	1

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4.2.2 List of specialization modules

4.2.2.1 Specialization subjects (e.g. whole specialization) modules (min. 36 ECTS points):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ISS105014	Water quality management	2					K2IS_W09, S2EQM_W02	30	90	3	1.0	T	E			S	Ob.
2	ISS105024	Raw materials management	1					S2EQM_W03, S2EQM_W05, K2IS_K02	15	30	1	0.5	T	E			S	Ob
3	ISS105024	Raw materials management					1	S2EQM_U01, K2IS_K03, K2IS_K02	15	30	1	0.5	T	Z		P	S	Ob
4	ISS105053	Water treatment technology	2					K2IS_W09, S2EQM_W02	30	60	2	1.0	T	E			S	Ob
5	ISS105053	Water treatment technology			1			K2IS_U06, S2EQM_U02, K2IS_K01	15	30	1	0.5	T	Z		P	S	Ob
6	ISS105054	Sanitary biology	1					K2IS_W09, S2EQM_W05, K2IS_K02	15	30	1	0.5	T	E			S	Ob
7	ISS105054	Sanitary biology			1			K2IS_U06, S2EQM_U02, K2IS_K02	15	30	1	0.5	T	Z		P	S	Ob
8	ISS105055	AutoCad			1			S2EQM_U03, K2IS_K03	15	30	1	0.5	T	Z		P	S	Ob
9	ISS105028	Water supply systems	1					K2IS_W09, S2EQM_W07, K2IS_K02	15	30	1	0.5	T	Z			S	Ob
10	ISS105028	Water supply systems				1		K2IS_K02, K2IS_U02, K2IS_U05, K2IS_U06, S2EQM_U05	15	30	1	0.5	T	Z		P	S	Ob
11	ISS105015	Biodegradable materials	2					K2IS_W09, S2EQM_W03, K2IS_K03	30	60	2	1.0	T	Z			S	Ob
12	ISS105016	Waste water treatment technology	2					K2IS_W09,	30	60	2	1.0	T	E			S	Ob

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							S2EQM_W02										
13	ISS105016	Waste water treatment technology			1		K2IS_U06, S2EQM_U02, K2IS_K01	15	30	1	0.5	T	Z		P	S	Ob
14	ISS105030	Solid waste management	2				S2EQM_W04	30	60	2	1.0	T	E			S	Ob
15	ISS105030	Solid waste management			1		S2EQM_U02, S2EQM_U04, K2IS_K02	15	30	1	0.5	T	Z		P	S	Ob
16	ISS105019	Waste gases purification	2				K2IS_W09, S2EQM_W06	30	60	2	1.0	T	E			S	Ob
17	ISS105019	Waste gases purification		1			S2EQM_U04, K2IS_K01	15	30	1	0.5	T	Z		P	S	Ob
18	ISS105057	Environmental toxicology	1				K2IS_W09, S2EQM_W05, K2IS_K02	15	30	1	0.5	T	Z			S	Ob
19	ISS105057	Environmental toxicology			1		K2IS_U06, S2EQM_U02, K2IS_K02	15	30	1	0.5	T	Z		P	S	Ob
20	ISS105032	Environmental health hazards	2				K2IS_W09, S2EQM_W05	30	60	2	1.0	T	Z			S	Ob
21	ISS105033	Sewage systems	1				K2IS_W09, S2EQM_W07, K2IS_K02	15	60	2	0.5	T	Z			S	Ob.
22	ISS105033	Sewage systems				1	K2IS_U02, K2IS_U05, S2EQM_U03, S2EQM_U05, K2IS_K02	15	30	1	0.5	T	Z		P	S	Ob.
23	ISS105049	Membrane separation processes in environmental protection	1				K2IS_W09, S2EQM_W02	15	60	2	0.5	T	Z			S	Ob.
24	ISS105049	Membrane separation processes in environmental protection			1		K2IS_U06, S2EQM_U02, K2IS_K01	15	30	1	0.5	T	Z		P	S	Ob.
25	ISS105035	Diploma seminar				2	K2IS_U06, S2EQM_U01, S2EQM_U06, K2IS_K01, K2IS_K03	30	60	2	1.0	T	Z		P	S	Ob

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Total	20	1	7	2	3		495	1080	36	16.5					
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4.2.2.2 Diploma project (master thesis) module (min. 20 ECTS points):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational 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	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ISS105034	Diploma project (master thesis)				15		K2IS_U06, S2EQM_U01, S2EQM_U07, K2IS_K01, K2IS_K03	225	600	20	7.5	T	Z		P	S	Ob
		Total				15			225	600	20	7.5						

Altogether for specialization modules:

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
20	1	7	17	3	720	1680	56	24.0

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4.3 Diploma dissertation module

Type of diploma dissertation	Magisterska/Master Thesis	
Number of diploma dissertation semesters	Number of ECTS points	Code
1	20	ISS105034
Character of diploma dissertation		
<p>Master Thesis (literature survey and/or project and/or computer program and/or assessment-diagnosis) Master thesis should include computational, investigational or experimental solution of the posted scientific or technical problem using the knowledge acquired during the second degree studies. The thesis should include:</p> <ol style="list-style-type: none"> 1) definition of thesis problem, 2) an extension of the problem, 3) method of particular solutions, 4) the use of appropriate analytical tools, 5) formulation of research proposals on the basis of analysis, deposition of the research problem in broadly citing literature review. 		
Number of BK ¹ ECTS points	7.5	

5. Ways of verifying assumed educational effects

Type of classes	Ways of verifying assumed educational effects
lecture	exam, test
class	test, colloquium, participation in the discussion of problems, activity
laboratory	test, entrance test, lab report
project	project defence
seminar	participation in discussion, presentation of the topic, the essay
training	practice report
diploma dissertation	thesis preparation

6. Total number of ECTS points, which student has to obtain from classes requiring direct academic teacher-student contact (enter total of ECTS points for courses/groups of courses denoted with code BK¹)

36.5 ECTS

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

Number of ECTS points for obligatory subjects	8
Number of ECTS points for optional subjects	0
Total number of ECTS points	8

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

Number of ECTS points for obligatory subjects	42
Number of ECTS points for optional subjects	1
Total number of ECTS points	43

9. Minimum number of ECTS points, which student has to obtain doing education modules 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 OG)

9 ECTS points

10. Total number of ECTS points, which student may obtain doing optional modules (min. 30% of total number of ECTS points)

57 ECTS points

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11. Range of diploma dissertation

Questions related to water and wastewater treatment.

Questions related to water supply and sewage systems.

Questions related to solid waste management.

Questions related to sanitary biology and environmental health hazards.

Questions related to air pollutants and their sources

12. Requirements concerning deadlines for crediting courses/groups of courses for all courses in particular modules

<i>No.</i>	<i>Course code</i>	<i>Name of course</i>	<i>Crediting by deadline of... (number of semester)</i>
1	ZMZ000155	Strategic management	1
2	FLH071121W	Ethics of new and emerging technologies	1
3	ISS005006	Engineering applications of mathematical statistics	1
4	ISS105051	Environmental chemistry	1
5	ISS105052	Automation in environmental engineering	1
6	ISS005007	Environmental management	2
7	GPA105723	Spatial planning	2
8	ISS105029	Reliability of engineering systems	2
9	ISS105036	Organization of construction works	3
10	ISS105037	Buildings regulations	3
11	ISS105038	Renewable energy systems	3
12	ISS105014	Water quality management	1
13	ISS105024	Raw materials management	1
14	ISS105053	Water treatment technology	1
15	ISS105054	Sanitary biology	1
16	ISS105055	AutoCad	1
17	ISS105028	Water supply systems	1

¹BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students

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

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁶ KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷ Optional – enter W, obligatory – enter Ob

18	ISS105015	Biodegradable materials	2
19	ISS105016	Waste water treatment technology	2
20	ISS105030	Solid waste management	2
21	ISS105019	Waste gases purification	2
22	ISS105057	Environmental toxicology	2
23	ISS105032	Environmental health hazards	2
24	ISS105033	Sewage systems	2
25	ISS105049	Membrane separation processes in environmental protection	2
26	ISS105035	Diploma seminar	3
27	ISS105034	Diploma project (Master Thesis)	3

13. Plan of studies (attachment no. 3)

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⁶ KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷ Optional – enter W, obligatory – enter Ob

Approved by faculty student government legislative body:

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

.....
Date, Dean's signature

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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)

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