

## **PROGRAMME OF EDUCATION**

**FACULTY:** Geoengineering, Mining, and Geology

**MAIN FIELD OF STUDY:** mining and geology

in area of technical sciences

**EDUCATION LEVEL:** 1<sup>st</sup> level, inżynier studies

**FORM OF STUDIES:** part-time

**PROFILE:** general academic

**LANGUAGE OF STUDY:** Polish

Content:

1. Assumed educational effects – attachment no. 1
2. Programme of studies – attachment no. 2

Faculty Council Resolution of 05.09.2012

In effect since 01.10.2012

\*delete as applicable

## PROGRAMME OF STUDIES

## 1. Description

<i>Number of semesters: 8</i>	<i>Number of ECTS points necessary to obtain qualifications: 210</i>
<i>Prerequisites (particularly for second-level studies):</i>	<i>Upon completion of studies a graduate obtains professional degree of: inżynier 1<sup>st</sup> level qualifications</i>
<i>Possibility of continuing studies: 2<sup>nd</sup> level studies</i>	<i>Graduate profile, employability:</i>  <i>Graduate profile: A graduate will possess abilities to use knowledge of problems within the domain of general education, basic sciences, main-field-of-study and specialization subjects the programme of studies encompasses. The graduate will be prepared to organize, manage, supervise and design mining operations and geotechnical works in the field of mechanization, electrification and assessment of industry impact on environment. They will be prepared to manage mining processes, to operate and supervise equipment and technological systems. They will have mastered the knowledge of up-to-date techniques and technologies, production management methods, methods for protection against mining and natural hazards, methods of mining safety maintenance and rescue work and mining machinery management. The graduate will know the principles of natural and secondary resources rational management, natural environment protection and post-mining land reclamation and development.</i>

	<p><i>Employability: The graduate will be prepared for engineering work in mines, geological and geotechnical enterprises and in the other branches of economy connected with mining and geology.</i></p>
<p><i>Indicate connection with University's mission and its development strategy:</i></p> <p><i>Faculty of Geoengineering, Mining, and Geology is a leading scientific and educational centre in Poland and a significant one in EU. The faculty is a regional leader in science and education in the field of geotechnology and earth sciences. The profile and quality of education are of international level and fit home and European demand.</i></p> <p><i>The faculty educates in technological fields supported by natural and economic sciences. The faculty aims its educational offer at students with aptitude for exact sciences and simultaneously interested in natural and social sciences.</i></p> <p><i>The faculty stimulates international exchange of students and scientists on a large scale. Part of the educational offer is available in English. The faculty creates ties with selected foreign universities and in reasonable cases collaborates in the process leading to granting a double diploma.</i></p>	

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

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

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

<sup>7</sup> Optional – enter W, obligatory – enter Ob

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

**The field of science: technical sciences**

**Scientific disciplines: geodesy and cartography, mining and engineering geology**

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

**The economic development of the country depends on natural resources, abilities to use them and required adequate technical staff. The assumed educational effects meet economy practice needs in the field of mineral resources management, technologies and techniques of their exploration and prospecting, mining, processing, industrial land reclamation and development, and enterprises (especially mines) management supported by information, environment, and people management with the use of state-of-the-art information and marketing techniques and technologies. Such the integration of economy needs and assumed educational effects makes the labour market favourable for the Faculty graduates.**

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<sup>7</sup> Optional – enter W, obligatory – enter Ob

## 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. 7 ECTS points):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	EKG2201	Introduction to Economics	1				1	K_W07, 10, 35 K_U01, 05, 09 K_K02, 03	20	60	2	2	T	E, Z			KO	Ob
2	EKG7202	Economics in Mining	3		2	1		K_W10, 31, 35 K_U28 K_K04-06	60	150	5	4,5	T	E, Z			KO	Ob
Total			4		2	1	1		80	210	7	6,5						

##### 4.1.1.4 Information technologies module (min. 2 ECTS points):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	INZ0534	Information Technologies	2					K_W09 K_K03	20	60	2	2	T	Z	O		KO	Ob
Total			2						20	60	2	2						

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

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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 <sup>1</sup>
lec	cl	lab	pr	sem				
<b>6</b>		<b>2</b>	<b>1</b>	<b>1</b>	<b>100</b>	<b>270</b>	<b>9</b>	<b>8,5</b>

### 4.1.2 List of basic sciences modules

#### 4.1.2.1 Mathematics module

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MAP9945	Mathematical Statistics	1	1				K_W03 K_U04 K_K07	20	90	3	1,5	T	Z	O		PD	Ob
Total			1	1					20	90	3	1,5						

#### 4.1.2.3 Chemistry module

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	CHG2101	Chemistry	2		2			K_W05 K_U07 K_K07	40	120	4	3,5	T	E, Z			PD	Ob
Total			2		2				40	120	4	3,5						

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

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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 <sup>1</sup>
lec	cl	lab	pr	sem				
3	1	2			60	210	7	5

## 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 <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses				
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>	
1	MMG1201	Descriptive Geometry and Technical Drawing	1				3		40	180	6	4	T	Z				PD	Ob
2	GGG1201	Fundamentals of Mining	2						20	60	2	2	T	E				K	Ob
3	OSG1201	Introduction to ecology and Environment Protection	2						20	60	2	2	T	Z				KO	Ob
4	MMG2201	Technical Mechanics	2	2					40	150	5	4	T	E, Z				K	Ob
5	GKG2204	Engineering Surveys	2		2				40	120	4	3	T	Z				K	Ob
6	GEG2101	Fundamentals of Geology (GK)	1				2		30	120	4	3	T	E (lec), Z				K	Ob
7	GEG3202	Hydrogeology	2		1				30	90	3	3	T	E, Z				K	Ob
8	GGG4202	Drilling Technology	2						20	60	2	1	T	Z				K	Ob

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

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9	GGG3201	Soil Mechanics	2		1			K_W18 K_U16 K_K01	30	120	4	2,5	T	E, Z			K	Ob
10	MMG3202	Strength of Materials	2	2				K_W15 K_U13 K_K07	40	150	5	4	T	E, Z			K	Ob
11	GEG3104	Mineralogy and Petrology (GK)	1		2			K_W05, 16 12	30	90	3	4	T	E (lec), Z			K	Ob
23	ELG4804	Electrotechnics	2		1			K_W25 K_U22 K_K01	30	120	4	1,25	T	E, Z			K	Ob
13	GEG4202	Mineral Deposit and Mining Geology	2		1	1		K_W20 K_U18	40	150	5	4	T	E, Z			K	Ob
13	ING3201	Computer Science			2			K_U05 K_K01	20	60	2	1	T	Z			PD	Ob
17	GGG4203	Rock Mass Mechanics	2		1	1		K_W23 K_U20 K_K04	40	180	6	4,5	T	E, Z			K	Ob
14	GGG4108	Applied Geophysics	1			1		K_W20 K_U18 K_K02, 07	20	60	2	1,5	T	E, Z			K	Ob
16	GGG5201	Mineral Processing I	2					K_W22 K_U19 K_K07	20	90	3	3	T	Z			K	Ob
12	GGG5204	Surface Mining Technology	3			2		K_W07, 08, 19 K_U05, 17 K_K01, 02	50	180	6	5	T	E, Z			K	Ob
22	GKG5201	Mining Surveying	2		2	1		K_W12, 27 K_U10, 24 K_K04, 07	50	150	5	4	T	Z			K	Ob
18	GGG4110	Blasting Technique I	2					K-W19, 26, 35	20	60	2	2	T	Z			K	Ob
24	MMG5201	Introduction to Machine Construction (GK)	2			1		K_W24 K_U21 K_K07	30	120	4	3	T	Z (lec)			K	Ob
25	GGG6105	Mine Dewatering	2			1		K_W28 K_U25 K_K02	30	90	3	2	T	E, Z			K	Ob

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20	GGG6206	Underground Mining Technology	3			2		K_W07, 26, 30, 32 K_U05, 23, 32 K_K01, 02	50	180	6	5	T	E, Z			K	Ob
27	MMG6202	Machinery Systems	3		1	1	1	K_W24 K_U29	60	150	5	4	T	E, Z			K	Ob
21	GGG6207	Blasting Technique II				2		K_U23, 32 K_K04	20	60	2	1	T	Z			K	Ob
19	GGG6208	Mineral Processing II	2		2			K_W22 K_U19 K_K07	40	90	3	3	T	E, Z			K	Ob
29	GGG6209	Rock Extraction and Processing	1		1			K_W19, 22 K_U04, 19 K_K01	20	60	2	1,5	T	Z			K	Ob
26	GGG7202	Occupational Safety and Health and Rescue Work I	2	1	1			K_W33 K_U33, 34 K_K04	40	120	4	3,5	T	E, Z			K	Ob
28	GGG7204	Mine Ventilation and Fires I	2		1			K_W30 K_U27 K_K04	30	180	6	5	T	E, Z			K	Ob
33	OSG7204	Postmining Land Reclamation and Development (GK)	1			1	1	K_W29 K_U01, 05, 26, 32, 34	30	120	4	2,5	T	Z (lec)			K	Ob
31	GGG8204	Occupational Safety and Health and Rescue Work II	2	1				K_W33 K_U30 K_K02, 03	30	90	3	3	T	E, Z			K	Ob
32	GGG8206	Mine Ventilation and Fires II	2		1	1		K_W30 K_U27 K_K01	40	120	4	3,5	T	E, Z			K	Ob
30	PRG8201	Geological and Mining Law	1				1	K_W34 K_U31 K_K02	20	60	2	1,5	T	Z			K	Ob
34	GGG8203	Mineral Deposit and Production Management (GK)	1			2		K_W35 K_U32 K_K07	30	120	4	3	T	Z (lec)			K	Ob
Total			59	6	20	22	3		1100	3810	127	100,25						

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**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 <sup>1</sup>
lec	cl	lab	pr	sem				
<b>59</b>	<b>6</b>	<b>20</b>	<b>22</b>	<b>3</b>	<b>1100</b>	<b>3810</b>	<b>127</b>	<b>100,25</b>

## 4.2 List of optional modules

### 4.2.1 List of general education modules

#### 4.2.1.1 Liberal-managerial subjects modules (*min. 3 ECTS points*):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	FLG108846	Liberal-Managerial Subjects	2					K_W06 K_K03	20	60	2	1	T	Z	O		KO	W
2	PKG108847	Liberal-Managerial Subjects	1					K_W06	10	30	1	0,5	T	Z	O		KO	W
Total			3						30	90	3	1,5						

#### 4.2.1.2 Foreign languages module (*min. 5 ECTS points*):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	JZL100611	Foreign Language		4				K_U01	40	60	2	2	T	Z	O		KO	W
2	JZL100611	Foreign Language		4				K_U01	40	90	3	3	T	Z	O		KO	W
Total				8					80	150	5	5						

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

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

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<sup>7</sup> Optional – enter W, obligatory – enter Ob

### 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 <sup>1</sup>
lec	cl	lab	pr	sem				
<b>3</b>	<b>8</b>				<b>110</b>	<b>240</b>	<b>8</b>	<b>6,5</b>

## 4.2.2 List of basic sciences modules

### 4.2.2.1 Mathematics module (min. 20 ECTS points):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MAP9947	Mathematical Analysis I	2	2				K_W01 K_U02 K_K07	40	240	8	4	T	E, Z	O		PD	W
2	MAP9943	Algebra and Analytical Geometry	2	1				K_W02 K_U03 K-K07	30	120	4	2,5	Z	E, Z	O		PD	W
3	MAP009944	Mathematical Analysis II	3	2				K_W01 K_U02 K_K01, 07	50	240	8	4	T	E, Z	O		PD	W
Total			7	5					120	600	20	10,5						

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

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

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#### 4.2.2.2 Physics module (min. 11 ECTS points):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	FZP1014	Physics I	2	2				K_W04 K_U06 K_K01	40	180	6	6	T	E, Z	O		PD	W
2	FZP1015	Physics II	2		1			K_W04 K_U06	30	150	5	5	T	E, Z	O		PD	W
Total			4	2	1				70	330	11	11						

#### 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 <sup>1</sup>
lec	cl	lab	pr	sem				
<b>11</b>	<b>7</b>	<b>1</b>			<b>190</b>	<b>930</b>	<b>31</b>	<b>21,5</b>

### 4.2.3 List of main-field-of-study modules

#### 4.2.3.1 Main-field-of-study courses module (min. 28 ECTS points):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
2	GGG106012	Training		30					120	180	6		Z			P	K	W
4	GGG7106	Diploma Seminar					2		20	60	2	2	T	Z			K	W
5	GGG7114	Diploma Dissertation		8					80	420	14	5						
1	GGG010001	Optional Course	4						40	180	6		T	Z			K	W
Total			4	8			2		260	840	28	7						

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

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

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

<sup>7</sup> Optional – enter W, obligatory – enter Ob

**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 <sup>1</sup>
lec	cl	lab	pr	sem				
4	8			2	260	840	28	7

**4.3 Training module (Faculty Council resolution on principles of crediting training – attachment no. 2)**

Name of training		Field-of-Study Training	
Number of ECTS points	Number of ECTS points for BK classes <sup>1</sup>	Training crediting mode	Code
6	3	The training is crediting by the Proxy of the Dean on the basis of student's daily notes documenting realization of assumed the training programme. The final mark for the training is an arithmetic average of the mark for the quality of notes and the mark given by the plant's training tutor. The plant's tutor sends a certificate confirming realization of the training programme.	GGG106012
Training duration		Training objective	
4 weeks (20 days)		The objective of the field-of-study training realized at the Faculty of Geoengineering, Mining, and Geology is to instruct students in underground and surface mining technology of mineral deposits. In order to achieve that objective the students are obliged to participate in two fortnight's trainings, one in an underground mine and another in a surface mine.	

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

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

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<sup>7</sup> Optional – enter W, obligatory – enter Ob

#### 4.4 Diploma dissertation module

Type of diploma dissertation	inżynierska	
Number of diploma dissertation semesters	Number of ECTS points	Code
1	14	GGG8207
<b>Character of diploma dissertation</b>		
Literature survey, project, computer program, research		
Number of BK <sup>1</sup> ECTS points	5	

#### 5. Ways of verifying assumed educational effects

Type of classes	Ways of verifying assumed educational effects
lecture	examination, progress/final test
class	progress/final test
laboratory	pre-test, report on laboratory
project	project defence
seminar	participation in discussion, topic presentation, essay
training	report on training
diploma dissertation	prepared diploma dissertation

**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 BK<sup>1</sup>)**

152,5 ECTS

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

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

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

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<sup>7</sup> Optional – enter W, obligatory – enter Ob

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

Number of ECTS points for obligatory subjects	7
Number of ECTS points for optional subjects	31
Total number of ECTS points	38

**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 (lab, pr)	47
Number of ECTS points for optional subjects (lab, pr)	1
Total number of ECTS points	48

**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 O)

44 ECTS points

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

67 ECTS points

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

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

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<sup>7</sup> Optional – enter W, obligatory – enter Ob

## 11. Range of diploma examination

1. Classification of winning technologies and methods of dumping in surface mining.
2. Basic ways of operation of bucket-wheel excavators.
3. Prognosis of operating efficiency of bucket-wheel excavators.
4. Basic ways of operation of chain-and bucket caterpillar excavators.
5. Prognosis of operating efficiency of chain-and bucket caterpillar excavators.
6. Basic ways of operation of belt conveyor spreaders.
7. Kinds and types of dumps in open pits.
8. Mining systems and types of excavations in rock mining.
9. Methods for excavation of large blocks of rock minerals.
10. Nomenclature, types and functions of headings in underground mines.
11. Room workings in underground mines.
12. Mining systems for bedded deposits.
13. Support of underground mining workings.
14. Dynamic phenomena in underground mining.
15. Classification of mining explosives.
16. Classification of mining electrical fuses.
17. Non-electric initiation systems.
18. Mine atmosphere, thermodynamic parameters and properties of basic components of mine air.
19. Methods of calculation of airflow within ventilation networks.
20. Ventilation of blind drifts.
21. Principles of air distribution within ventilation networks.
22. Combustion processes, fire gases, fire depression (drop of ventilation pressure).
23. Methods for early detection of open and spontaneous fires.
24. Disturbances within ventilation network during underground mine fires and mine protection procedures.
25. Active and passive fire suppression.
26. Protection of staff during underground fires.

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<sup>7</sup> Optional – enter W, obligatory – enter Ob



27. Factors influencing climatic conditions within mine workings.
28. Principle of operation of air conditioning machine.
29. Methods for air conditioning of development and winning operations.
30. General principles of mine rescue establishment in mines.
31. Organization of mine rescue in mines.
32. Tasks, constitution and equipment of mine rescue unit.
33. General principles of mine rescue work.
34. Rescue plan, rescue operation plan.
35. Organization of work protection in Poland.
36. Employers tasks related to Occupational Safety and Health regulations.
37. Employees tasks related to Occupational Safety and Health regulations.
38. National Labour Inspectorate.
39. National Sanitary Inspection.
40. What are geotechnical classifications of rock mass used to?
41. How and why are stress-strain characteristics tested?
42. How and why are full stress-strain characteristics tested?
43. Environmental impact assessment.
44. Present and describe the mine operation cycle.
45. Law system in environmental protection.
46. Preliminary treatment of rock blocks-processes, machinery, and equipment.
47. Precise treatment of stone elements-processes, machinery, and equipment.
48. Treatment of stone element surface-processes, machinery, and equipment.
49. Specify base minerals, their properties and use in processing.
50. Grain-size analysis: grain-size distribution and methods for its determination.
51. Principles of drawing samples for analyses.
52. Types of processing operations.
53. Describe technologies and machinery used for processing.
54. Flotation.
55. Magnetic separation.

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56. Mechanized longwall mining systems in hard coal winning (components).
57. Machines for continuous mining (examples and co-operating means of transport).
58. Machines for cyclic mining (examples and co-operating means of transport).
59. Machinery and equipment used for overburden direct throw over an open cast.
60. Classification of transportation equipment applied to mining.
61. Transportation systems used in hard coal and copper ore mines.
62. Transportation systems used in lignite surface mining.
63. Transportation systems used in rock mining.
64. Conveyor belts.
65. Resistance to motion of belt conveyors.
66. Stretching equipment in belt conveyors.
67. Describe rock-forming minerals of igneous rocks.
68. Describe rock-forming minerals of sedimentary rocks.
69. Describe deposit-forming minerals of metallic mineral resource deposits.
70. Describe deposit-forming minerals of chemical mineral resource deposits.
71. Present selected rock-forming processes.
72. Describe selected igneous rocks being mined.
73. Describe selected sedimentary rocks being mined.
74. Describe selected metamorphic rocks being mined.
75. Depict connection between climate and periods of deposit formation of fossil fuels and evaporates in the Earth history.
76. Basic deposit forms and their examples.
77. Genetic classification of minerals and their examples.
78. Coal resources of Poland.
79. Bituminous mineral resources of Poland.
80. Metallic mineral resources of Poland.
81. Copper ore deposits in Poland.
82. Rock mineral resources of Poland.
83. Chemical mineral resources of Poland.
84. Basic geological and mining conditions of mineral resources exploitation.

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- 85. Categories of recognition of geological-deposit features of mineral resource deposits.
- 86. Geophysical prospecting (exploration) methods.
- 87. Prospecting (exploration) well geophysics.
- 88. Description of mine dewatering system.
- 89. Description of well dewatering system.
- 90. Water mining damages.
- 91. The influence of mine closure on water and ground environment.
- 92. Hydrogeological properties of rocks.
- 93. Base chemical components of groundwaters.
- 94. Physical properties of groundwaters.

**13. Plan of studies (attachment no. 1)**

Approved by faculty student government legislative body:

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

.....  
Date, Dean's signature

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