

## **PLAN OF STUDIES**

**FACULTY:** MECHANICAL AND POWER ENGINEERING

**MAIN FIELD OF STUDY:** POWER ENGINEERING

**EDUCATION LEVEL:** 2nd level, magister inżynier

**FORM OF STUDIES:** part-time

**PROFILE:** general academic

**SPECIALIZATION:** RENEWABLE SOURCES OF ENERGY

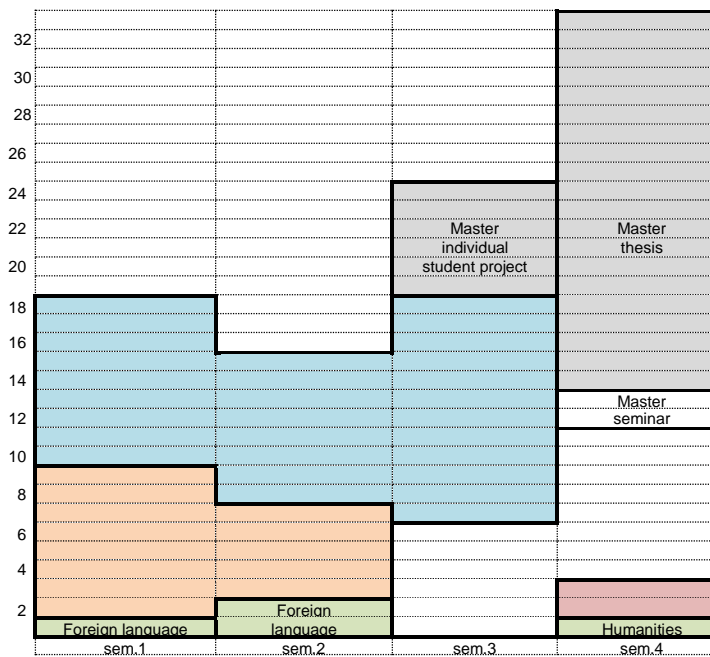
**LANGUAGE OF STUDY:** Polish

Mechanical and Power Engineering Faculty Council Resolution of 26.09.2012

In effect since 01.10.2012

Edited adjustment\_April 2014

## Plan of studies structure in point layout



### Legend

basic obligatory courses
general education optional courses
general education obligatory courses
obligatory field-of-studies courses
optional field-of-studies courses
optional specialization courses

<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

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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

## 1. Set of obligatory and optional courses and groups of courses in semestral arrangement

### Semester 1

#### Obligatory courses number of ECTS points 8

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 <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	ENN0900	Probability theory	2,13					K2ENG_W01	32	90	3	1,5	T	E				PD	Ob
2	ENN0900	Probability theory		1,07				K2ENG_U05	16	60	2	1,5	T	Z		P	PD	Ob	
3	ENN0192	Quantum Physics	4,26	2,13				K2ENG_W03	32	90	3	1,5	T	E			Pd	Ob	
Total			4,26	1,07					80	240	8	4,5							

#### Optional courses (minimum 80 hours in semester, 11 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 <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	JZL100655BK	Foreign Language, B2+ level		0,53				K2ENG_U04	8	30	1	0,75	T	Z	O	P	KO	W
2	ENN0181	Physics of the renewable energy	1,07					S2OZE_W01	16	60	2	1	T	Z			S	W
3	ENN0181	Physics of the renewable energy		1,07				S2OZE_U01	16	60	2	1,5	T	Z		P	S	W
4	ENN0181	Physics of the renewable energy					0,53	S2OZE_U02	8	30	1	0,75	T	Z		P	S	W
5	ENN0173	Water power engineering	1,07					S2OZE_W03	16	60	2	1	T	Z			S	W
6	ENN0173	Water power engineering		0,53				S2OZE_U04	8	30	1	0,75	T	Z		P	S	W

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<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

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7	ENN0173	Water power engineering				0,53		S2OZE_U05	8	60	2	1,5	T	Z		P	S	W
Total			2,14	2,13		0,53	0,53		80	330	11	7,25						

### Altogether in semester

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				
6,40	3,20		0,53	0,53	160	570	19	11,75

## Semester 2

### Obligatory courses number of 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					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	ENN0502	Numerical methods	2,13					K2ENG_W02	32	90	3	1,5	T	E			PD	Ob
2	ENN0502	Numerical methods			2,13			K2ENG_U06	32	60	2	1,5	T	Z		P	PD	Ob
Total			2,13		2,13				64	150	5	3						

### Optional courses (minimum 96 hours in semester, 10 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 <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	JZL100655BK	Foreign Language (second), any level		2,13				K2ENG_U09	32	60	2	1,5	T	Z	O	P	KO	W
2	ENN0194	Photo-thermal energy conversion system	0,53					S2OZE_W09	8	30	1	0,5	T	Z			S	W
3	ENN0194	Photo-thermal energy conversion system				1,07		S2OZE_U12	16	60	2	1,5	T	Z		P	S	W

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<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

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4	ENN0355	Refrigeration heating systems	0,53				S2OZE_W05	8	30	1	0,5	T	Z			S	W
5	ENN0355	Refrigeration heating systems			0,53		S2OZE_U07	8	30	1	0,75	T	Z		P	S	W
6	ENN0130	Wind power plants	0,53				S2OZE_W06	8	30	1	0,5	T	Z			S	W
7	ENN0130	Wind power plants			1,07		S2OZE_U08	16	60	2	1,5	T	Z		P	S	W
Total			1,59	2,13	2,67			96	300	10	6,75						

### Altogether in semester

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				
3,72	2,13	2,13	2,67		160	450	15	9,75

### Semester 3

#### Obligatory courses number of ECTS points 6

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 <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	ENN0553	Mathematical modelling of energy generation installations	1,6					K2ENG_W05	24	60	2	1	T	E			K	Ob
2	ENN0553	Mathematical modelling of energy generation installations			2,67			K2ENG_U07	40	120	4	3	T	Z		P	K	Ob
Total			1,6		2,67				64	180	6	4						

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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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### Optional courses (minimum 156 hours in semester, 17 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 <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	ENN1363	Master individual student project				4,00		K2ENG_U01 K2ENG_U03 K2ENG_K01 K2ENG_K04	60	150	5	2	T	Z		P	K	W
2	ENN0140	Geothermal power engineering	0,53					S2OZE_W07	8	30	1	0,5	T	Z			S	W
3	ENN0140	Geothermal power engineering		0,53				S2OZE_U09	8	30	1	0,75	T	Z		P	S	W
4	ENN0570	Fuel cell and technology of hydrogen production	1,07					S2OZE_W02	16	60	2	1	T	Z			S	W
5	ENN0570	Fuel cell and technology of hydrogen production			0,53			S2OZE_U03	8	30	1	0,75	T	Z		P	S	W
6	ENN0301	Pollutants emission control	1,07					S2OZE_W04	16	60	2	1	T	Z			S	W
7	ENN0301	Pollutants emission control			1,07			S2OZE_U06	16	60	2	1,5	T	Z		P	S	W
8	ENN1122	Power production systems and technology from biomass	1,07					S2OZE_W08	16	60	2	1	T	Z			S	W
9	ENN1122	Power production systems and technology from biomass		0,53				S2OZE_U10	8	30	1	0,75	T	Z		P	S	W
Total			3,74	1,06	1,60	4,00			156	510	17	9,25						

### Altogether in semester

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				
5,34	1,06	4,27	4,00		220	690	23	13,25

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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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## Semester 4

### Obligatory courses number of ECTS points 12

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 <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	ENN1380	Master seminar					1,07	K2ENG_U01 K2ENG_U02 K2ENG_K01 K2ENG_K03 K2ENG_K04 K2ENG_K05	16	60	2	1,5	T	Z		P	K	Ob
2	ENN1062	Energy systems	1,07					K2ENG_W07	16	60	2	1	T	Z			K	Ob
3	ENN1062	Energy systems		0,53				K2ENG_U08	8	30	1	0,75	T	Z		P	K	Ob
4	ENN1112	New generation energy technologies	1,07					K2ENG_W04	16	90	3	1,5	T	E			K	Ob
5	ENN1300	Environmental management	1,07					K2ENG_W06	16	60	2	1	T	Z			K	Ob
6	ENN0701	Marketing and management	1,07					K2ENG_W06	16	60	2	1	T	Z	O		KO	Ob
Total			4,28	0,53			1,07		88	360	12	6,75						

### Optional courses (minimum 8 hours in semester, 21 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 <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	HNN100200BK	Humanities	0,53					K2ENG_W06 K2ENG_K02	8	30	1	0,5	T	Z	O		KO	W
2	ENN1430	Master thesis						K2ENG_U01 K2ENG_U02 K2ENG_U03 K2ENG_K01 K2ENG_K04 K2ENG_K05		600	20	4	T	Z		P	K	W
Total			0,53						8	630	21	4,5						

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## Altogether in semester

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				
4,81	0,53			1,07	96	990	33	11,25

## 2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
ENN0900 ENN0192	1. Rachunek prawdopodobieństwa 2. Fizyka kwantowa	1
ENN0502	1. Metody numeryczne	2
ENN0553	1. Modelowanie matematyczne instalacji energetycznych	3
ENN1112	1. Technologie energetyczne nowej generacji	4

## 3. Numbers of allowable deficit of ECTS points after particular semesters

Semester	Allowable deficit of ECTS points after semester
1	8
2	13
3	0

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