STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Passing Project		**1010622121010624451**

Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanical Engineering	**(brak)**	**1 / 2**
Elective path/specialty	**Subject offered in:**	**Course (compulsory, elective)**
Internal Combustion Engines	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **-**	Classes: **-**	Laboratory: **-**	Project/seminars: **4**	**6**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**6 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student possesses a knowledge on engineer level in mechanics, construction of machines, machine engineering, strength of materials, thermodynamics
2	**Skills**	Student can combine acquired information, accomplish interpretation, conclude, associate theory and practice
3	**Social competencies**	Student is conscious of the role of combustion engine and simultaneously understands its unfavorable effect on environment and consequences

Assumptions and objectives of the course:

Completion of the Project II requires the knowledge of theory as well as planning and performance of experiment in the field of combustion engines. Students carrying out the efforts relative to the Project II actively participate in tests and experiments of essential and practical nature carried out at the moment in the Institute of IC Engines

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has a deepen knowledge in thermodynamics and fluid mechanics within the scope necessary for understanding the principle and calculations of thermal and flow processes occurring on work machines . - [-]

2. He knows modern methods of computer graphics - [-]

3. He has a broad knowledge on modern constructional materials such as carbon fibres, composites, ceramics, as well as their form, processing and applications - [-]

4. Student has a broaden knowledge on machines life-cycle, principles of work machine operation and destructive processes that occur in during machines run - [-]

5. He possesses a general knowledge on types of tests and test methods applied to work machines using modern measurement methods and data acquisition. - [-]

Skills:

1. Student knows how to use the acquire and accumulated knowledge in the field of heat technology and flow mechanics to simulate thermodynamic processes in technological systems of machines using the dedicated computer programs. - [-]

2. Student is able to plan and carry out experimental tests of specific processes taking place in machines as well as standard test procedures of work machine or vehicle as representatives of certain group.. - [-]

Social competencies:

1. Student is conscious of importance and understands non-technical aspects and results of engineer?s activity as well as effect of this activity on environment, and responsibility for taken decisions. - [-]
2. Student is conscious of importance and understands non-technical aspects and results of engineer?s activity as well as effect of this activity on environment, and responsibility for taken decisions. - [-]

Assessment methods of study outcomes

Assessment of presented project or paper

Course description

Parts and subassemblies of combustion engine as well as their operation.

Engine operational indexes and characteristics, specification of combustion process, engine actual cycles.

Construction and operation of basic engine systems: crank system, fuel supply system, lubrication system, cooling system, exhaust system.

Characteristic features of engine subassemblies, their work, modifications introduced in order to improve the operational indexes.

Carrying out the measurements on engine test stand. Measurements of toxic exhaust compounds.

Environmental hazard caused by combustion engine run: toxic exhaust compounds, their sources, methods of emission reduction and removal, measuring methods.

Basic bibliography:

1. S. Brandt, Analiza danych, PWN, 1998

2. M. Korzyński: Metodyka eksperymentu. Planowanie, realizacja i statystyczne opracowanie wyników eksperymentów, WNT, 2006

3. K. Mańczak: Technika planowania eksperymentu. WNT, 1976.

4. W. Serdecki (red.): Badania silników spalinowych, Poznań 2012.

Additional bibliography:

1. Z. Kneba, S. Makowski: Zasilanie i sterowanie silników, WKiŁ, 2004

2. J. Mysłowski: Doładowanie silników, WKiŁ, 2002

3. T. Rychter, A. Teodorczyk: Teoria silników tłokowych, WKiŁ, 2006

Result of average student's workload

Activity	Time (working hours)
1. Preparations for classes	0
2. Participation in classes (according to schedule)	15
3. Revision of content of classes / report	5
4. Consultations	15
5. Preparations for examination / credit hour	115
6. Participation in examination / credit hour	0

Student’s workload

Source of workload	hours	ECTS
Total workload	150	6
Contact hours	30	0
Practical activities	150	0