STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Oils, Fuels and Other Exploitation Materials for Motor Vehicles**		Code **1010614161010610213**
Field of study **Mechanical Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **3 / 6**
Elective path/specialty **Motor Vehicles and Tractors**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	
No. of hours Lecture: **16** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits **2**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **1 50%** **1 50%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Has a basic knowledge of chemistry (including organic chemistry) and physics (including fluid mechanics). Knows the SI units.
2	**Skills**	Is able to make measurements of time, temperature, length, and convert units. Knows the standardization system in Poland and can use standards. Is able to collect the results of measurements.
3	**Social competencies**	Is aware of the need for cooperation with a group of students and perform different roles depending on the needs of the tasks within a specified time. Is aware of the need to preserve the health and safety rules when performing laboratory work.

Assumptions and objectives of the course:

Practical introduction to the methods of measurement of physical and chemical properties of lubricants, fuels and other exploitation materials.

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

Knowledge:

1. Knows the basic methods of measurement of lubricating oils, greases and fuels, is able to assess and compare the quality and the degree of degradation in service - [K1A_W03, K1A_W11]

Skills:

1. Is able to choose the instruments and apparatus, and to realize measurements of selected properties of exploitation materials. Can draw up the results of these measurements and draw conclusions. - [K1A_U17 K1A_U23]

Social competencies:

1. Is aware of the importance of the assessment of the exploitacion materials quality for the operation of transport vehicles. - [K1A_K02]
2. Is aware of the need to avoid environmental contamination associated with the use of lubricants and fuels. - [K1A_K04]

Assessment methods of study outcomes

Assessment based on the current control of the theoretical preparation for each laboratory and made reports.

Course description

Ultrasonic method of determining the shear resistance of lubricating oils.

Kinematic viscosity. Determination of lubricating properties of oils. Measurement of penetration

of lubricating greases. Determination of moisture and particulate matter in luricating oils. Measurement of the temperature of ignition, burning and freezing of lubricating oils and fuels.

Study on the oil viscosity as a function of temperature using a rotational viscometer . Dynamic viscosity. The use of infrared spectroscopy to identify and assess changes in operating motor oils. Determination of fractional composition of gasoline by distillation.

Basic bibliography:

1. Zwierzycki W., Płyny eksploatacyjne do środków transportu drogowego, Wydawnictwo Politechniki Poznańskiej, Poznań ? 2006

2. Podniało A., Paliwa, oleje i smary w ekologicznej eksploatacji, Wyd. NT , Warszawa 2002

3. Czarny R., Smary plastyczne, Wyd. NT, Warszawa 2004

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Preparation for laboratory	8
2. Participation in laboratory exercises	15
3. Storing the content of exercises and report	10
4. Participation in the completion	1

Student's workload

Source of workload	hours	ECTS
Total workload	34	2
Contact hours	17	1
Practical activities	34	1