Course code: Course item:

1. INFORMATION ABOUT THE COURSE

A. Basic information

Course title	Basics of machine diagnostic
Field of study	Mechanical engineering
Cycle	First cycle
Study profile	Academic
Study mode	Full-time
Specialisation	Cars and tractors
Unit responsible for the field of study	Faculty of Mechanical Engineering
Lecturer	PhD. Marcin ŁUKASIEWICZ, PhD. Michał LISS
Introductory courses	Fundamentals of machine construction, applied mechanics
Prerequisites	no prerequisites

B. Semester/ weekly timetable

Semester	Lectures	Classes	Laboratories	Project classes	Seminars	Fieldwork	ECTS credits
winter /summer	15^E	-	30	-	-	-	4

C. Assumed outcomes and aims - aims bind the course programme with the study programme and are referred to in learning outcomes point 2

2. LEARNING OUTCOMES (acc. to National Qualifications Framework)

No.	Description of learning outcomes	Reference to learning outcomes for the field of study	Reference to learning outcomes for the area of study
KNOWLEDGE			
K1	has knowledge of the role of diagnostics in the life of machines	MBM1_W51	T1A_W01 T1A_W03 T1A_W06
K2	has knowledge of the possibilities of information techniques in machine condition analysis	MBM1_W52	T1A_W03 T1A_W07
SKILLS			
S1	can define machine diagnostics tasks	MBM1_U51	T1A_U01 T1A_U04 T1A_U08
S2	has the ability to use information techniques for analysis	MBM1_U52	T1A_U08

	condition of machines		
SOCIAL COMPETENCES			
SC1	can use the acquired knowledge in a practical way	MBM1_K51	T1A_K01 T1A_K05 T1A_K06
SC2	can make a synthetic analysis of methods and results	MBM1_K55	T1A_K05

3. TEACHING METHODS

multimedia lecture, laboratory classes

4. METHODS OF EXAMINATION

Oral/written exam, colloquium, short paper – every laboratory classes

5. COURSE CONTENT

Specify the content separately for each type of classes in accordance with point I.B.	**Lecture** Subject, tasks and basic concepts of diagnostics. The place of diagnostics in the life of the vehicle. Physical aspects of technical diagnostics. Generation of diagnostic signals. Modeling in technical diagnostics of vehicles. Construction of diagnostic procedures. Experiments in machine diagnostics. Control algorithms condition and location of damage. Information technologies in vehicle diagnostics. Artificial intelligence in machine diagnostics. Experiments and simulation. New methods for assessing the dynamic state of vehicles. **Laboratories** Introduction to classes, health and safety regulations. Diesel engine diagnostics. Drive system diagnostics. Diagnostics of spark ignition engines. Suspension system diagnostics. Vehicle body diagnostics. Vehicle lighting system diagnostics. Brake system diagnostics. Air conditioning system diagnostics. Vehicle steering diagnostics. Electrical system diagnostics. Diagnosis of actress and sensorics in cars and tractors.

6. VALIDATION OF LEARNING OUTCOMES

Learning outcome	Form of assessment					
	Oral examination	Written examination	Colloquium	Project	Report	…………
K1	x					
K2	x					
S1			x			
S2			x			
SC1			x			
SC2					x	

7. LITERATURE

Basic literature	1. Żółtowski B.: Fundamentals of machine diagnostics. Wyd. UTP, Bydgoszcz, 2011.
Supplementary	1. Żółtowski B., Cempel C.: Engineering of machine diagnostics. ITE Radom 2004.

literature	2. Żółtowski B., Łukasiewicz M., Kałaczyński T.: Information technology in the study of machine condition. Wyd.UTP, Bygoszcz 2012.

8. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE EXPECTED LEARNING OUTCOMES EXPRESSED IN TIME AND ECTS CREDITS

Student's activity		Student workload– number of hours
Classes conducted under a direct supervision of an academic teacher or other persons responsible for classes	Participation in classes indicated in point 1B	45
	Supervision hours	10
Student's own work	Preparation for classes	25
	Reading assignments	5
	Other (preparation for exams, tests, carrying out a project etc)	10
Total student workload		95
Final number of ECTS credits		4