POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Automation, diagnostics and repair of special-purpose vehicles [S1MiBP1>ADiNPS]

Course

Field of study	**Year/Semester**
Mechanical and Automotive Engineering	4/7
Area of study (specialization)	**Profile of study**
–	general academic
Level of study	**Course offered in**
first-cycle	Polish
Form of study	**Requirements**
full-time	elective

Number of hours

Lecture	Laboratory classes	Other
45	15	0

Tutorials	Projects/seminars	
0	0	

Number of credit points

4,00

Coordinators	Lecturers
dr inż. Tomasz Rochatka tomasz.rochatka@put.poznan.pl	

Prerequisites

Knowledge: 1. The student has a basic knowledge of the physics, mechanics and strength of materials machine construction and the theory of machines and mechanisms. Sills: 1. The student is able to obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, as well as create and justify opinions. Social competences: 1. The student is ready to fulfill social obligations and co-organize activities for the social environment. 2. The student is ready to think and act in an entrepreneurial way.

Course objective

Getting to know the automation elements of special-purpsoe vehicles Getting to know the organization and principles of planning service and repair works and the method of restoration the fitness of the special-purpsoe vehicles

Course-related learning outcomes

Knowledge:
1. Has basic knowledge of technical thermodynamics, ie the theory of thermodynamic changes, heat flow, thermal machines and heating, drying and cooling devices.

2. Has elementary knowledge of the basics of computer science, i.e. computer architecture, binary, decimal and hexadecimal counting system, representation of numbers and graphic characters in computer memory, variable types, general knowledge of low, medium and high level languages used in computer programming, operating systems , databases, RAD development environments, and typical engineering applications.
3. Has basic knowledge of the methods of linear measurements, measurements of stresses, strains, velocities, temperatures and fluid streams, including measurements of these quantities by electrical means.
4. Has elementary knowledge of automation systems, microcontrollers, control algorithms, automatic machines and industrial robots, electronic navigation systems used in machines and wired and wireless communication systems in local computer networks used in machines.
5. Has basic knowledge of tribological processes occurring in machines, i.e. friction, lubrication and wear.

Skills:
1. Student can design a technology of exploitation of a selected machine with a high degree of complexity.
2. Student can write user manual and safety manual for designed work machine or vehicle.
3. Can properly use modern equipment for measuring major physical quantities, used in machine research and production control.
4. Has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.

Social competences:
1. Is ready to critically assess his knowledge and received content
2. Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on its own.
3. Is ready to fulfill social obligations and co-organize activities for the benefit of the social environment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Credit based on a test of knowledge of the lectures and current control preparation for laboratory exercises and evaluation of their course and reports.

Programme content

Scientific knowledge. Development of automation, concepts related to automation, automatic systems, methods of regulating refrigeration systems in vehicles, regulation and control of compressors, evaporators and condensers, system controllers.
Methods of organizing repairs. Diagnostic systems. Technological processes of repairing assemblies and elements of specialized vehicles. Methods of repairing specialized vehicles.

Course topics

Teaching methods

1. Wykład z prezentacją multimedialną
2. Laboratorium z wykonywaniem pomiarów

Bibliography

Basic
1. Nosal S. Inżynieria odnowy maszyn, wybrane zagadnienia Politechnika Poznańska 2017
2. Rewolińska A. Ocena możliwosci wykorzystania badań diagnostycznych rurociągu transportującego wysłodziny w celu poprawy jego niezawodności, Postępy Nauki i Techniki nr 13, 2012
3. Chłędowski M., Pieniążek J. Podstawy automatyki : w ćwiczeniach i zadaniach, Oficyna Wydawnicza Politechniki Rzeszowskiej 2019

4. Cypko J., Cypko E. Podstawy technologii i organizacji napraw pojazdów mechanicznych. WkiŁ, Warszawa 1989

5. Klimpel A., Napawanie i natryskiwanie cieplne. Technologie, WNT, Warszawa, 2000

6. Adamiec P., Dziubiński P., Regeneracja i wytwarzanie warstw wierzchnich elementów maszyn transportowych, Wyd. Pol. Śląskiej, Gliwice, 1999

Additional

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Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	60	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	2,00