

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Repair and Regeneration Engineering</b>		Code <b>1010614161010612535</b>
Field of study <b>Mechanical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 6</b>
Elective path/specialty <b>Motor Vehicles and Tractors</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>16</b> Classes: <b>-</b> Laboratory: <b>12</b> Project/seminars: <b>-</b>		No. of credits <b>3</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 67%</b> <b>1 33%</b>
<b>Responsible for subject / lecturer:</b> JOSKO, Marian, Assoc. Prof., PhD (Eng.), DSc email: marian.josko@put.poznan.pl tel. 61 665 22 47 Faculty of Machines and Transport 3 Piotrowo street, 60-965 Poznan, Poland		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge in the range of physics and mechanics as well as a structure and maintenance of motor vehicles, particularly in their servicing
2	<b>Skills</b>	Ability to selection, integration and interpretation of obtained information and skills in conclusion and opinion formulation
3	<b>Social competencies</b>	Consciousness of importance and reality of non-technical aspects and effects of repair activity in the case of motor vehicles
<b>Assumptions and objectives of the course:</b> The study of technological problems of repairing of damaged automotive vehicles and regeneration their worn parts as well as some main elements connected with planning of the objects of technical bases of motorisation.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Knows aims and basic technologies of repair processes of motor vehicles as well as technologies of regeneration of their parts - [K1A_W02]		
2. Has a knowledge involving the kinds, organisational aspects and selection of particular technologies of restoration of damaged assemblies and worn parts of vehicles - [K1A_W05-W11]		
3. Knows a technology of a major repair of the assemblies of motor vehicles in operational arrangement and methods of their parts verification during repair process - [K1A_W14]		
4. Has a knowledge concerning of the necessary equipment needed for the proper carrying out of the repair and regenerative processes - [K1A_W17-W21]		
5. Knows main principles of repair of an important assemblies of engine, chassis, body and equipment of the road vehicles as well as main methods of their parts regeneration - [K1A_W24]		
6. Knows fundamental materials used in repair and renovate processes as well as conditions decided about the quality of repair and renovation. - [-]		
<b>Skills:</b>		

<ol style="list-style-type: none"> <li>1. Is able to carry out the verification of parts and the repair of selected inefficient assemblies of automotive vehicles - [K1A_U04]</li> <li>2. Has the ability to assort adequate method of the repair for restoration of an efficiency of the damaged vehicle and can work out rudiments of the repair technology - [K1A_U15-U17]</li> <li>3. Is able to carry out a repairing (emergency or major) the most important assemblies of an engine and automotive vehicle - [K1A_U20-U27]</li> <li>4. Has the ability to verify a worn vehicle part in the repair and regeneration processes as well as to estimate the quality of repair or renovation carried out - [-]</li> <li>5. Is able to carry out the general overhaul or running repair of important vehicle assembles and the repair of an engine equipment - [-]</li> <li>6. Is able to make a proposal of some object of technical bases of motorisation and their equipment in the range of technological project - [-]</li> <li>7. Has the ability to draw up and to use the technological documentation of repair process of motor vehicle and its assembly as well as to take the industrial safety into account - [-]</li> </ol>
<p><b>Social competencies:</b></p> <ol style="list-style-type: none"> <li>1. Has an awareness of social meaning of vehicle repairing and regeneration as a form of rational utilisation of automotive vehicles to realisation of some various social needs - [K1A_K01]</li> <li>2. Understands the role of repair in the aspect of an assurance of suitable safety level in motor vehicles in both the active and passive safeties - [K1A_K05]</li> <li>3. Understands the sense of regeneration as a way of reduction of maintenance costs of automotive vehicles and its ecological aspect - [K1A_K06]</li> <li>4. Is able to organise and direct of a team carrying out some repair operations in the framework technical infrastructure of motorisation. - [-]</li> </ol>

<p><b>Assessment methods of study outcomes</b></p>
<p>Attestation of the laboratories, confirmed the ability to application of principles and operations of repair and regeneration, obtained during lectures and needed for repairing of an engine assemblies and chassis of car as well as manual mastery of repair for chosen elements of engine or a chassis of an automotive vehicle.</p> <p>Credit with the course by method of written check the basic knowledge connected with repairing of automotive vehicles, with the knowledge of regeneration and repair systems, kinds, general principles of repair and ranges repair actions concerning main assemblies of engine and the vehicles, with consideration of contemporary construction and requirements.</p>
<p><b>Course description</b></p>
<p>Topic / problem: Description / Scope</p> <p>Introduction and organization of the subject ? basic notions connected with repair of automotive vehicles and regeneration their parts; an explanations of the need of the repair of unserviceable vehicles, determined by failures, damages of their elements and faults, extremely wear and degradation of parts and materials as well as by the assuring of the maintenance of a fleet of vehicles. Economical and ecological aspects of regeneration. Technological processes of repair and regeneration ? technological documentations. Technology of washing and cleaning of vehicle assemblies and their parts. Verification of parts. The quality of repair and regeneration. An industrial safety during the repair and regeneration processes. Classification and characteristics of regenerative methods of the parts. Materials technology and regenerative materials. Technologies of regeneration. Repair of main assemblies of automotive vehicles. Post accidental repairs of car bodies ? purposes and tasks such repairs; technologies applied in car body repair; sheet-metal and paint shops and their specific equipment; the technology of car body renovating in varnish manufacture; renovate materials. Technological calculations and the planning of an objects of motorisation background. Repairs versus active and passive safeties of motor vehicles. Problems of an industrial safety during vehicle repairs ? requirements concerning condition and an equipment in the bases of vehicle fleets; functions of vehicle depots, station and car workshops in the range of the repair services. An identification of treats during vehicle repairs realisation and some ways of limitation of their effects; main principles of an industrial safety on repair work-stands.</p>
<p><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Kozłowski M. (Ed.): Structure and Maintenance of Vehicles, Part 2 ? Service, Diagnosis and Repair Assemblies and Subassemblies, Vogel Business Media, Wrocław, 2006 (in Polish).</li> <li>2. Kostrzewa St., Nowak B.: Fundamentals of the parts regeneration of automotive vehicles. WKiL, Warsaw, 1986 (in Polish).</li> <li>3. Adamiec P., Dziubiński J., Filipczyk J.: Repair technology of automotive vehicles. WPSI, Gliwice, 2002.</li> <li>4. Uzdowski M., Abramek K., Garczyński K.: Motor Vehicles. Technical Problems of Maintenance and Repair. WKiL, Warsaw, 2009 (in Polish).</li> <li>5. Trzeciak K.: Equipment of Car Shops. Auto, Warsaw, 2005 (in Polish).</li> <li>6. Livesey W.A., Robinson A.: The repair of vehicle bodies. Elsevier, London, New York, Tokyo, 2005.</li> </ol>

<b>Additional bibliography:</b>		
1. Orzelowski S.: Repair and Service of Motor Vehicles. WSzIP, Warsaw, 2011 (in Polish).		
2. Lewicki J.: Selected Problems of Service and Repair Technology. Printing House of Szczecin's Polytechnic, Szczecin, 1990 (in Polish).		
3. Sobieszynska G., Neuman Zb.: Varnish Manufacture for Automotive Vehicles. OR SIMP, Szczecin, 2012 (in Polish)		
4. Rychter T.: An Engineer of Automotive Vehicles. WSzIP, Warsaw, 2012 (in Polish).		
5. Stepinski D.: Labour Safety in Car Repair Workshop. WKiL, Warsaw, 2010 (in Polish).		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Lectures	30	
2. Consultations	1	
3. Preparation for examination	10	
4. Activity in examination	2	
5. Preparation for laboratory	7	
6. Activity in laboratories	15	
7. Consolidation of laboratory's knowledge / reports	7	
8. Attendance in the attestation of laboratory	1	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	79	3
Contact hours	49	2
Practical activities	30	1