

<b>Study program:</b> Industrial Engineering – Mechanical Engineering			
<b>Course title:</b> Engines			
<b>Professor/assistant:</b> Aleksandrović B. Branislav			
<b>Type of course:</b> Elective			
<b>ECTS credits:</b> 6			
<b>Prerequisites:</b> none			
<b>Aims of the course:</b> Acquiring knowledge about engines that propel the vehicles. Learning about basic design characteristics of the engine; the theory of the engine's working process; indicators of cost-effectiveness and efficiency of work cycles; engine combustion theory; work of individual parts and assemblies; engine's thermal balance; propulsion materials; driving characteristics of engine and engine's efficiency.			
<b>Learning outcomes:</b> Students are trained to select and evaluate propulsion materials; propulsion and efficiency of different types of engines. Students are trained to do engineering jobs in engine production and exploitation, work on testing and maintenance.			
<b>Syllabus:</b> <i>Theoretical Classes</i> Vehicle propulsion. Operating principles of engines and electric and hybrid propulsion systems. Basic concepts of piston mechanisms in internal combustion engines. Main parts of the IC engine and principles of operation of gasoline and diesel engines. Thermodynamic, calculated and actual cycles of ICE. The process of changing work materials in four-stroke and two-stroke ICEs. The combustion in ICEs. Indicative and effective engine parameters. Degree of engine utilization. Engine's heat balance. Propulsion characteristics of an engine. Engine's efficiency. The production of toxic components, engine's noise, generated waste and recycling goals. Propulsion materials, lubricants and fuel for ICE. Alternative fuels. Ignition systems for gasoline and diesel engines. Systems for supplying gasoline and diesel engines with fuel. Systems for lubricating ICE. Systems for ICE cooling. Electronic components and systems for diagnostics in engines. <i>Practical Classes</i> Practical exercises, solving practical problems through examples, preparation for term papers.			
<b>Literature:</b> 1. R. Pešić, S. Petković, S. Veinović: MOTORNA VOZILA I MOTORI OPREMA, Mašinski fakultet u Banja Luci i Kragujevcu, 2008. god. 2. M. Tomić, S. Petrović: MOTORI SUS, Mašinski fakultet Beograd, 2004. god. 3. S. Veinović, R. Pešić, S. Petković: POGONSKI MATERIJALI MOTORNIM VOZILA, Mašinski fakultet u Banja Luci i Kragujevcu, 2000. god. 4. A. Grujović: ELEKTRONIKA AUTOMOBILA, Mašinski fakultet Kragujevac, 2008. god.			
<b>Number of active classes:</b> 60		<b>Lectures:</b> 30	<b>Practical classes:</b> 30
<b>Teaching methods:</b> Interactive lectures, auditory exercises, laboratory exercises, independent student work.			
<b>Grading system</b> (maximum 100 points) grading scale from 5 to 10: below 51 points – student fails the exam, grade 6 from 51- 60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91- 100 points.			
<b>Pre-exam obligations:</b>	<b>Points:</b>	<b>Final exam:</b>	<b>Points:</b>
Activity during lectures	max 5	Oral exam	max 50
Practical training	max 5		
Written test(s)	max 20		
Term papers	max 20		
Minimum requirement for the final exam	30		