STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Passing Project**		Code **1010614161010614451**
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: **-** Classes: **-** Laboratory: **-** Project/seminars: **2**		No. of credits **6**
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 17%** **5 83%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge from the range of mechanical engineering and vehicle design. Detailed information about the vehicle movement dynamics. Knowledge of the rules on strength and fatigue tests.
2	**Skills**	Understanding the design rules. Ability to choose and use the relationships from the scope of the traction calculations and the strength and fatigue analysis. Usage of the spreadsheet.
3	**Social competencies**	Determining the hierarchy and the schedule of tasks during designing the elements and subassemblies of road vehicles. Ability to identify the problems and decide computational-structural dilemmas. Self-reliance.

Assumptions and objectives of the course:

The self-reliant design of the element or subassembly of a vehicle drive train system (or alternatively, another system), what includes the execution of traction calculations, the decision about principal geometric parameters, and the execution of strength and fatigue calculations.

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

Knowledge:

1. Knows the rules and stages of designing the subassemblies and elements of particular road vehicle systems - [K1A_W05]
2. Understands relations between the vehicle parameters and its power transmission system - [K1A_W05]
3. Knows principles of the parameter selection for vehicle elements and subassemblies, depending on expected operating conditions - [K1A_W24]
4. Knows algorithms for the strength and fatigue computations - [K1A_W24]

Skills:

1. Is able to match the vehicle drive system parameters with the engine and vehicle data - [K1A_U03]
2. Is able to identify the load magnitude affecting a given element or subassembly - [K1A_U04]
3. Is able to select the technical solution of a element or subassembly ensuring proper fulfilment of the tasks - [K1A_U04]
4. Is able to use normative data - [K1A_U08]
5. Is able to make the technical documentation (workshop drawing) of a given element or subassembly - [K1A_U16]

Social competencies:

1. Is able self-reliantly to carry on the traction calculations and strength analyses based on externally provided data - [K1A_K04]
2. Is able to define priorities in the design of elements or subassemblies of a vehicle power transmission system - [K1A_K04]
3. Understands the need of applying the solutions which ensure a road safety and environmental protection - [K1A_K04]

Assessment methods of study outcomes

Passing the class on the basis of a project documentation

Course description

Stage I - the traction calculations

Equilibrium of the forces affecting the road vehicle in rectilinear movement: the total resistance to motion and the driving force. The rolling resistance, the aerodynamic drag and the gradient resistance. The engine power and torque curves - the approximate method for determining. The overall gear ratio in the highest gear: the highest gear ratio and the final drive ratio. The first gear ratio. Selection of the number of gears on the basis of the first and highest gears. Selection of the indirect gear ratios. Final selection of real gear ratios. The traction and dynamic characteristics, the power balance.

Stage II - the geometric and strength computations

Initial guidelines and assumptions for designing a element or subassembly of a powertrain, the selection of parameters and materials. Calculations of basic geometrical quantities. Taking into account the structural conditions and standards. Strength and fatigue computations. The verification tests. Comparison to allowable values of the scope of strength, stability and fatigue. Drafting the technical documentation to pre-determined extent.

Basic bibliography:

1. Arczyński St., Mechanika ruchu samochodu, WNT, Warszawa, 1994
2. Siłka W., Teoria ruchu samochodu, WNT, Warszawa, 2002
3. Jaśkiewicz Zb., Projektowanie układów napędowych pojazdów samochodowych, WKiŁ, Warszawa, 1982
4. Jaśkiewicz Zb., Wąsiewski A., Układy napędowe pojazdów samochodowych: obliczenia projektowe, OWPW, Warszawa, 2002
5. Stańczyk T.L., Lomako D., Komputerowe obliczenia zespołów samochodów i ciągników, WPŚ, Kielce, 2004
6. Dębicki M., Teoria samochodu ? teoria napędu, WNT, Warszawa, 1976

Additional bibliography:

1. Dębicki M., Teoria samochodu ? teoria napędu, WNT, Warszawa, 1976

Result of average student's workload

Activity	Time (working hours)
1. Classes	15
2. Consultations	1
3. Preparation and development of the project documentation	100
4. Admission to the credit	1

Student's workload

Source of workload	hours	ECTS
Total workload	117	6
Contact hours	17	1
Practical activities	100	5