STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Railway vehicles - maintenance infrastructure/ organization**		Code **1010624251010623431**
Field of study **Transport**	Profile of study (general academic, practical) **(brak)**	Year /Semester **3 / 5**
Elective path/specialty **Railway Transport**	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: **16** Classes: **8** Laboratory: **-** Project/seminars: **-**		No. of credits **2**
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**		ECTS distribution (number and %) **100 2%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	The student has some basic knowledge about the vehicles.
2	**Skills**	The student can use the acquired knowledge for the analysis of specific phenomena and processes occurring in the motion of objects.
3	**Social competencies**	Student showing independence in solving problems, acquisition and improvement of acquired knowledge and skills.

Assumptions and objectives of the course:

The aim of the course is acquaintance of students with the construction of vehicles. Students receive General knowledge and skills in the field of rail vehicles and their construction and construction teams rail vehicles.

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

Knowledge:

1. knowledge in the field of transport vehicles, parameters of technical performance, the basic mechanisms and units, sources of the drive, chassis, types, construction of railway transport - [K1A_W14]
2. knows basic technical parameters and operational transport - [K1A_W12]
3. have the knowledge necessary to understand the engineering, transport, rail transport - [K1A_W21]

Skills:

1. can receive information from the literature, Internet, databases and other sources and foreign, can of information, draw conclusions and develop and justify reviews - [K1A_U01]
2. can be attributed to the professional environment using formal record of design, technical drawings, concepts and definitions of the field studiowanego specialty - [K1A_U02]

Social competencies:

1. understands the need and knows opportunities for continuous professional development in the field, knows the need to acquire new knowledge for professional development - [K1A_K01]
2. is consciousness transfer the acquired knowledge to the society, making efforts to this information were clear - [K1A _K08]
3. can identify and solve problems associated with the implementation of the profession, in particular, the problems on the plane technology - environment - [K1A _K06]

Assessment methods of study outcomes

A written exam, a Colloquium loans

Course description

Development of historic automobiles and motor vehicles, trains and railway transport. The organization of a single project construction vehicles. The division of vehicles. Kinds of traction, types of currents in electric traction. The width and the geometry of the path.

Geometry and holding the wheel in the Torah, the stability of rail vehicles. Specifics of individual wheels.

Standards of safety, quality course, calibration, comfort and noise, and their influence on the construction of vehicles.

Cars and motor vehicles: the skeleton, the protector (frame), awning. Structural aluminum components from plastic and tools. The loads acting on the car and durability of vehicles, safety of driver and passengers. Chassis types of vehicles. Trolleys for rail vehicles, their tasks. Non-standard decisions of the chassis. A General overview of the chassis components, wheels, wheel sets, gently, keeping the pair of wheels, suspension springs, features vast, air suspension, navigation hangers. The elements of the transfer of axial forces and porzecznych from the body. Clutch międzywózkowy. The use of rubber, rubber and plastic items chassis. Parts międzywagonowe: niesamoczynne and machine device type standard and from different manufacturers. Construction bumpers międzywagonowych, the problem of longitudinal forces in the train and timing cars

The locomotives division, General construction locomotives internal combustion and electric equipment. Body of the locomotive driver's cab. Types and design of internal combustion engines for locomotives. The type and design of the gear motor, construction transmissions, gearboxes przyosiowe. The drive system of electric locomotives and electric drive locomotives internal combustion: types of currents and control systems (generators, main), the species and the construction of traction engines. The drive control traction of the car, pulling characteristics of diesel locomotives.

Machines, equipment and accessories in rail vehicles. Computer network rail vehicles and in the train.

Discussion of the examples of locomotives.

Types of brakes of Railways, General information, and construction.

Discussion of construction of locomotives: their types, principle of operation, the scheme of the boiler system.

The construction of passenger cars, equipment parts passenger cars, wagons with przechylnym pudłem.

Freight cars: species, structure, Types and structure of wagons samowyładowczych.

High-speed trains, units of traction vehicles, trains, buses scales

Trams: species, structure. Overview of modern design solutions. Railway jednoszynowe: types, system of the bearing and motor

Railway magnetic: types, construction of the highway, lifting system. The transmission.

Special vehicles: cars bimodalne, vehicles, road-rail, cranes, hunter stalking of wild animals.

Railway gear.

Basic bibliography:

1. Krawczyński F., Nieliwodzki J.: Zaplecze techniczne służby trakcji PKP. WKŁ, Warszawa.
2. Baranowski E., Kosciuk K., Maciszewski Z: Naprawa taboru kolejowego. WKŁ, Warszawa 1977.
3. Gruszyński J.: Eksploatacja taboru kolejowego. WKŁ, Warszawa 1984.

Additional bibliography:

1. Gronowicz J, Kasprzak B.: Lokomotywy spalinowe. WKŁ, Warszawa 1989.
2. Instrukcje i Przepisy PKP z zakresu obsługiwania taboru szynowego.

Result of average student's workload

Activity	Time (working hours)
1. Preparation for the performance	5
2. Preparing for exercises	7
3. Participation in lectures	60
4. Part in the exercises	15
5. Securing the content of lessons	10
6. Consultations in lectures	2
7. Consultations for physical exercises	2
8. Exam preparation	30
9. Preparation of set-off	8
10. Participation in the exam	2
11. Participation in success	2

Student's workload

Source of workload	hours	ECTS
Total workload	143	2

Contact hours	83	0
Practical activities	0	0