STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Maintenance and Technology of Railroad Works	**1010102111010121025**

Field of study	Profile of study (general academic, practical)	Year /Semester
Civil Engineering Second-cycle Studies	**general academic**	**1 / 1**
Elective path/specialty: **Railways**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time): **full-time**	
No. of hours: Lecture: **45** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits: **7**
Status of the course in the study program (Basic, major, other): **major**	(university-wide, from another field): **from field**	
Education areas and fields of science and art: **technical sciences**		ECTS distribution (number and %): **7 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Has knowledge of managing business in the construction sector, knows standards and guidelines for design of linear structures; knows and applies acts of law, standards and guidelines
2	**Skills**	Uses specialized tools in order to find useful information, software supporting work of a designer and of construction process organiser; knows how to prepare a schedule of construction works and manage a construction process; is able to analyse risks during the performance of projects and operation of building
3	**Social competencies**	pCan work individually and in a group on a given task or eventually manage a team; Takes responsibility for solidity of own and team work?s results; complements and enhances knowledge about railway construction; Takes responsibility for own and team?s safety; Consciousness about a need to improve professional skills and personal competence

Assumptions and objectives of the course:

Getting to know the technologies in the repair and maintenance works of railway superstructure and subgrade. The influence of a rolling stock and temperature on the work of continuous welded track

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

Knowledge:

1. Student knows maintenance and repair works of the railway superstructure and subgrade - [K_W11]
2. Student knows machineries and processes using in the maintenance and repair works of the railway superstructure and subgrade - [K_W14]
3. Student knows the technologies used for the maintenance of the railway line - [K_W17]

Skills:

1. Student is able to choose an appropriate technology for subgrade and superstructure repairs - [K_U05]
2. Student is able to choose an appropriate method of rail stressing process - [K_U10]
3. Student is able to analyze creep of rails and their impact on the work of continuous welded track - [K_U12]

Social competencies:

1. Student is responsible for solidity of own work?s results - [K_K02]
2. Student alone complements and enhances knowledge about railway construction - [K_K03]
3. Student in conscious about a need to improve professional skills and personal competence - [K_K06]

Assessment methods of study outcomes

Verification of knowledge: class participation and colloquium at the end of semester. Getting points for: active participation in the classes, knowledge presented at the colloquium. Verification of skills: active participation in the projects; completing 3 projects, oral defense of the projects and studies; discussion of the solutions used in projects. Getting points for: activity in the classroom, knowledge of the issues presented in the projects, substantive quality of the projects.

Course description

1. Shaping of a railroad.
2. Selection of machines for railway works ? capacity of machines.
3. Strengthening of subgrade.
4. Modernization and maintenance of a railway line.
5. Technology of subgrade and superstructure repair works.
6. Machinery for track works.
7. Elements of health and safety at railway works

Basic bibliography:

1. Maszyny i urządzenia do robót torowych, tom I, Koktysz, M. Bernaś, WKiŁ, Warszawa, 1990
2. Budowa i utrzymanie dróg kolejowych, M. Batko, WKiŁ, Warszawa, 1985
3. Budowa i utrzymanie dróg kolejowych, tom II, Semrau, H. Zamięcki, WKiŁ, Warszawa, 1975
4. Budowa, modernizacja i naprawy dróg kolejowych, Bogdaniuk B., Towpik K., KOW, Warszawa 2010
5. Praca zbiorowa pod red. J. Sysak: Drogi Kolejowe. PWN, Warszawa 1986
6. Podstawy dróg kolejowych, J. Sysak, WKiŁ, Warszawa 1982
7. Kolejowe budowle ziemne, Skrzyński E., Sikora R., Tom II. WKiŁ, Warszawa 1987
8. Utrzymanie nawierzchni kolejowej, K. Towpik,WKiŁ, Warszawa, 1990
9. Wpływ temperatury na pracę toru kolejowego, Łoś M, WKiŁ, Warszawa 1974

Additional bibliography:

1. Modern Railway Track, C. Esveld, Delft, 2001
2. Stability of continuous welded rail track, M. A. Van, Delft, 1995
3. Dziennik Ustaw Rzeczypospolitej Polskiej, Warszawa, dnia 15 grudnia 1998 r., Nr 151, Poz. 987: Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 10 września 1998 r. w sprawie warunków technicznych, jakim powinny odpowiadać budowle kolejowe i ich usytuowanie
4. Przepisy Id-1 (D-1) Warunki techniczne utrzymania nawierzchni na liniach kolejowych, Warszawa, 2005
5. Przepisy Id-3 (D-4), Warunki techniczne utrzymania podtorza kolejowego, Warszawa, 2004

Result of average student's workload

Activity	Time (working hours)
1. Student?s attendance to lectures	30
2. Current preparation to lectures	30
3. Preparation to final exam and student?s attendance to exam	40

Student's workload

Source of workload	hours	ECTS
Total workload	175	7
Contact hours	55	2
Practical activities	125	5