Course Unit Descriptor

Study Programme: Civil Engineering

Course Unit Title: Railway track superstructure and maintenance

Course Unit Code: GG525A

Name of Lecturer(s): Jovanović Stanislav

Type and Level of Studies: master

Course Status (compulsory/elective): elective

Semester (winter/ summer): summer

Language of instruction: english

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 5

Prerequisites: none

Course Aims:.

Enabling students for the acquisition of basic practical skills within the area of rail track superstructure and maintenance; application of those skills in further practical education; introduction to modern procedures of measuring and controlling railway infrastructure elements quality and condition, as well as maintenance, renewal and reconstruction of railway lines.

Learning Outcomes:

Acquisition of basic skills related to railway track superstructure elements and principles and methods of their calculation and dimensioning. Enabling students for work within the domain of railway track maintenance, renewal and reconstruction. Enabling students to apply acquired skills both in practice and further education.

Syllabus.

Railway track superstructure (RTS) elements; RTS static and dynamic calculation; rail temperature-induced stresses; RTS longitudinal forces; Continuously welded track (CWT) stability against buckling; RTS special structures; expansion devices; switches & crossings (S&C)

Condition-based decision-making basic concepts and its link with railway track diagnostics and maintenance; measuring and analysis of railway infrastructure elements (RIE) condition; basic concepts of track segmentation; RIE condition-parameters; RIE behavior basics; RIE deterioration-modeling; RIE maintenance management systems; RTS maintenance & renewal (M&R); manual and mechanized RTS routine maintenance; railway track substructure maintenance; railway track reconstruction notion, purposes and methodology;

Exercise: curve elements calculation for a given traffic loading; calculation of guiding forces and accelerations during the passage of a vehicle through a curve; RTS forces calculation induced by vehicles; calculation of temperature-induced stresses in CWT and stability control under given temperature regime; calculation of CWT forces on bridges; calculation of expansion devices capacity.

Maintenance: individual exercises; every student receives individually conceived tasks, thematically and chronologically compliant with the lectures.

Required Reading:

Relevant literature in English, tbd

Weekly Contact Hours:2	**Lectures: 2**	**Practical work: 0**

Teaching Methods:

Lectures (auditory, power-point), practice (numerical and graphical), consultations.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			