

Tárgytematika / Course Description **Road and railway construction**

EKNM_KETA037

Tárgyfelelős neve /

Teacher's name: dr. Fischer Szabolcs

Félév / Semester: 2026/27/1

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/1/0

Tárgy féléves óraszám /

Teaching hours(sem.):

OKTATÁS CÉLJA / AIM OF THE COURSE

Goal

Introduction of the recent knowledge of railway track structures. Materials, structural formations and construction technologies. Raw materials and construction technologies of road pavements.

TANTÁRGY TARTALMA / DESCRIPTION

Topics

1. Railway track substructure - General learnings
2. Production of bitumens and bituminous binders. Types, properties and tests of bitumens and bituminous binders. Production of modified bitumens. Types, properties and tests of modified bitumens.
3. Set-up of railway protection layers
4. Production of aggregates for road construction. Types, properties and tests of aggregates. Types, properties, and tests of hydraulically bounded mixtures. Production of hydraulically bounded mixtures.
5. Types, properties and tests of hot bituminous mixes. Mix design of hot bituminous mixes.
6. Railway track superstructure, part 1

7. Laboratory exercise: processing of test data of hot bituminous mixes. Preparation of expertise.
8. Railway track superstructure, part 2
9. Types testing, production and factory production control of hot bituminous mixes.
10. Railway track superstructure, part 3
11. Haulage and paving technology of hot bituminous mixes. Quality testing of bituminous layers.
12. Railway track superstructure, part 4
13. Types, properties and tests of materials for portland cement concrete pavements. Construction technology and quality testing of concrete pavements.

Consultation

At a given time and place.

Student separate work

Studying for the exam: 50 hours.

System.ArgumentException: Érvénytelen paraméter

a következő helyen: **System.Drawing.Bitmap..ctor(Int32 width, Int32 height, PixelFormat format)**

a következő helyen: **FastReport.RichObject.DrawRich(FRPaintEventArgs e)**

a következő helyen: **FastReport.RichObject.Draw(FRPaintEventArgs e)**

Acceptance of semester

Semester of those students will be accepted who

- sufficiently attended the lectures and exercises,
- semester projects shall be performed, accepted projects are rated by teacher,
- two test scripts shall be performed during the semester, the accepted test scripts are rated by teacher.

Exam and evaluation

Exams will be at given time and place in exam period. Enter for an examination by means of NEPTUN-system. Enter for exam is allowed for students with semester acceptance.

Duration of exam 60 minutes, during this time 3 questions should be answered.

Exam questions

1. Planning requirements at set-up of railway track subgrade.
2. Impacts on railway subgrade.
3. Serviceability limit state of subgrade.
4. Set-up of cross section of railway earthwork.
5. Density and load bearing capacity of railway earthwork
6. Functions of protection layer.
7. Coarse-grained soil protection layers for track with velocity $V > 120$ km/h.
8. Geotextiles in the layer structure.
9. Geogrids in the layer structure.
10. Rails (roles, requirements to rails, process of rail production, quality control tests, HSH rails)

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Literature

Learning can be happened with help of different sources as below:

- ppt presentations on web site
- Bernhard Lichtberger: Track Compendium. Formation, Permanent Way, Maintenance, Economics, - Tetzlaff Verlag GMBH & Co. KG, Hamburg, 2005
- Concrete pavements (Betonburkolatok). Szerk. Dr. keleti Imre. MBBE, Budapest, 2012. ISBN 978-963-08-4585-4
- Bituminous mixtures. test methods for hot mix asphalt. MSZ EN 12697-1...50
- MSZ EN Standards. Bituminous mixtures. Material specifications MSZ EN 13108-1...9.
- MSZ EN 13108-20 Bituminous mixtures. Type testing
- MSZ EN 13108-21 Factory production control
- Road technical specifications
- own lecture notes
- given sources from internet sites.

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL