Deliverable 3.7.3/T2.7.3

E-LEARNING METHODOLOGY AND MATERIALS

Leading partner:

TTK / Tallinna Tehnikakõrgkool /TTK University of Applied Sciences

Project partners:

KRAO / Kouvolan Rautatie ja Aikuiskoulutus OY

TSI/TTI / Transporta un Sakaru Instituts / Transport and Telecommunication Institute

HAMK / Hämeen ammattikorkeakoulu /Häme University of Applied Sciences

RTU / Rigas Tehniska Universitate /Riga Technical University

Content list

1. Introduction

As in the Third Steering Group and Management Meeting of the EDU-RAIL Project in Riga, Latvia (01.11.2017), it was stated that HAMK is starting the development work for EDU-RAIL e-learning platform and e-learning materials principles with cooperation of the HAMK Professional teacher education (AOKK). The focus is to develop an e-learning platform that supports learning facilities and that is easy to use. Another target is to develop an e-learning platform and e-learning materials so that it would be possible for a student to choose and build a customized module from all the EDU-RAIL partners' virtual courses that would be available in a virtual EDU-RAIL e-learning platform. The teaching platform and methods can be piloted within the module HAMK is responsible for. Working period will be from November 2017 until the end of March 2018. It was decided that the regulations for joint use of the above mentioned e-learning platform for students will be discussed and agreed on the final Steering Group Meeting of EDU-RAIL.

The following report has been made by the working group Dr. Jaana Kullaslahti (leader), Tarjaleena Tuukkanen, Dr. Nina Karasmaa and Teppo Sotavalta
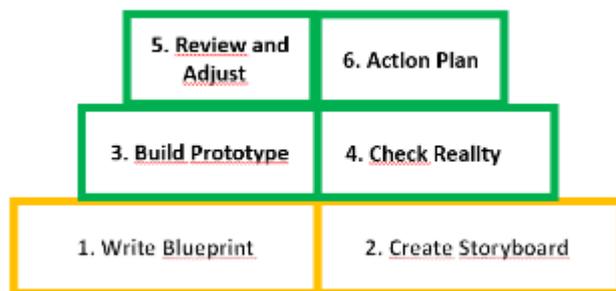
2. Study Environment Development Plan: E-Learning

The focus was on designing an e-learning environment plan for the EDU-RAIL project. The goal of this plan was to develop principles for designing e-learning modules and cross-institutional studies between EDU-RAIL partners. This would enable students to choose special courses from the e-learning modules of all the EDU-RAIL partners.

EDU-RAIL as a whole was worked out by utilising the Carpe Diem model and several workshops. The first workshop involved working out the overall principles and goals. The HAMK module was planned by utilising the results from this workshop and making a HAMK implementation plan from these. Answers to questions that arose as a result of the work done in the workshop were sought by means of an inquiry sent to the partners.

Carpe Diem is an internationally recognised e-learning design model used around the world. It is a team-based approach to learning design, suitable for designing or redesigning courses, modules, units or programs. The idea behind Carpe Diem is competence-based and student-centred learning. The Carpe Diem process can be broken down into six steps: writing a blueprint, making a storyboard, building a prototype, checking reality, reviewing and adjusting, and forming an action plan. (Salmon, G, 2017 http://www.gillysalmon.com/carpe-diem.html)

Carpe Diem learning design methodology

5. Review and Adjust	6. Action Plan
3. Build Prototype	4. Check Reality
1. Write Blueprint	2. Create Storyboard

Gilly Salmon http://www.gillysalmon.com/carpe-diem.html
(CC BY-NC-ND 4.0)

European Union
European Regional
Development Fund

Interreg
Central Baltic

EDU-RAIL

3. Designing E-Learning Modules for the EDU-RAIL Project: Workshop Outcomes

The mission of EDU-RAIL e-learning and modules; essential aspects to achieve:

- student-centred learning;

- students gain a real opportunity to choose courses (15 credits) from the modules of the EDU-RAIL partners;

enhance cross-border cooperation among teachers, students and practitioners in the future;
- supporting the harmonisation process of railway education;

- improving the quality of the workforce and gaining a better understanding of cross-border transportation;

- international module for students:

- gaining competence in intercultural communication and teamwork,

- encouraging international study and work;

- E-Learning enhances the digital competence and networking of teachers and students:

- involving multicultural teams;

- consists of face-to-face learning (starting and/or ending) and e-learning.

4. E-Learning Methodology: Pedagogy, Tools and Environments

- project & assignments in multicultural groups;

- mutual interaction, communal working, learning from others and sharing experiences;

- starting and closing face-to-face;

- real-time webinars and meetings (e.g. Skype, WebEx);

- learning platforms (e.g. Moodle);

- open access materials using a CC-license;

- distance learning and classroom learning at the same time with suitable communication tools in the classrooms

5. Storyboards for the Modules and Courses

All the courses and modules should have a storyboard showing the process of teaching, learning and assessment. The storyboard should work out the schedule, bringing a sense of flow and alignment between the various learning activities, outcomes, interaction, guidance and assessment. Moreover, it should take account of digital tools and environments (online or face-to-face). The storyboard is based on a pedagogical approach and solutions.
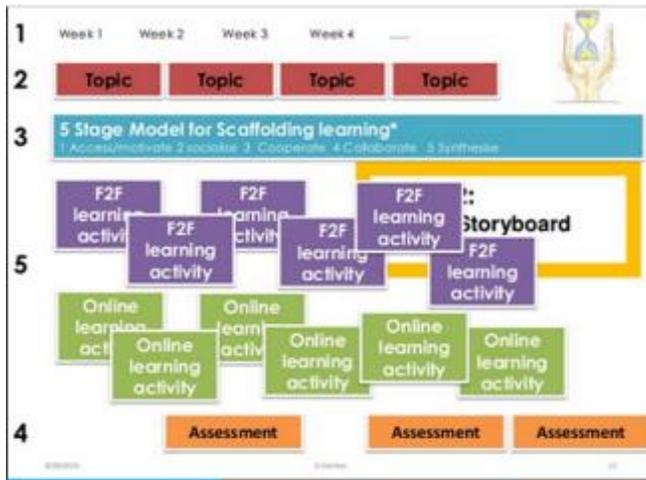
Gilly Salmon http://www.gillysalmon.com/carpe-diem.html (CC BY-NC-ND 4.0)

6. EDU-RAIL Inquiry: Common Principles for Cross-Studying

An EDU-RAIL inquiry was sent to all EDU-RAIL partners. Three educational institutions replied to the inquiry and their answers are summarised in Appendix 1. Based on the answers and the results from the workshops, quality criteria and principles for cross-studying were then formulated. The questions to the inquiry are shown below as follows:

1. Describe the target groups of your EDU-RAIL module.
2. What is the starting level required by the students?
3. The goal is for EDU-RAIL modules to be freely available to the students of the project partners. How will this be enabled by your module?
4. What are the critical issues with regard to making the modules available to students of other partners in the project?
5. What kind of digital tools are you going to use for your module? Specify at least a learning platform (LMS), online materials, web conferencing tools and group work tools. Do you have any other special application that is needed? If so, please name it.
6. How do international students enrol in your module? What kind of information do you need for students to enrol?
7. How do you evaluate the performance of international students in your module?
8. What kind of guidance could you provide for virtual students?

9. What kind of technical support is available if needed?
10. Would you like to raise any other issues? If so, what?

7. Quality Criteria for Online Implementation

The principles for cross-studying are set against the backdrop of electronic university of applied sciences (eAMK) quality criteria, which are recommended for use in the implementation of EDU-RAIL modules. Some of the principles which should be followed in particular are outlined below.

1. Target groups and users:

   Users and their needs are taken into consideration in the planning and the production phase, as well as during the implementation:

   - the starting level requirement for all students will be defined in the course description;
   - if necessary, the starting level can be established. Students participating in a course will have adequate basic information and knowledge for completing the course.

2. Content and materials:

   The content and materials will support the achievement of the learning objectives:

   - the materials will be ascertained reliable and up to date. Any outdated materials will have been updated;
   - the online implementation will utilise materials, which the institution has the right to access. References and copyright information will be marked appropriately;
   - an agreement will have been made regarding saving and utilisation procedures related to the materials produced by students during a course.

3. Tools:

   The online tools will support learning and the learning objectives:

   - the implementation will utilise online tools that support the achievement of the learning objectives, the pedagogical approach used and the work processes of the professional field in question;
   - instructions for accessing the online platform, the applications and tools to be used, as well as the creation of user accounts, will be easy to understand and located on the online platform or linked to it;

- the course description will list the basic equipment required for completing the course, as well as other necessary applications;
- the implementation will involve accessing online tools, which support the achievement of the learning objectives, are pedagogically justified, and are suitable for professional work processes;
- instructions for accessing the online platform and tools, downloading applications and creating a user account will be available on the online platform.

4. Assessment:

   Assessment will be transparent, continuous and versatile with a focus on developing reflection skills:

   evaluation will be performed throughout the learning process and it will be carried out by versatile methods. The students will participate in self-evaluations and peer reviews using the online platform tools.

5. Interaction:

   Interaction will support the achievement of the learning objectives:

   - the teacher and the students will have opportunities for mutual interaction, communal working, learning from others and sharing experiences online.

6. Guidance and feedback:

   Guidance and feedback will be timely and available for the duration of the course:

   - the arrangement and implementation methods of student guidance will be described on the online platform;
   - the people in charge of student guidance and the channels and schedules related to it will be described on the online platform;
   - the online platform will have a channel for the students' feedback and questions.

7. Support services:

   Support will be available in case of pedagogical or technical challenges:

   - agreements will have been made regarding the response times for support requests and the opening hours of helpdesk services. The times will be listed on the online platform;

- the students will find contact information on the online platform, through which they can receive help regarding any questions they may have about the content and
- completion of their studies or any technical problems. The students will be able to use a variety of tools to submit support requests.

8. Assignments:

The learning assignments will promote the achievement of the learning objectives. They will be working life oriented, enabling each student's individuality to be taken into account. The work methods chosen for the implementation will support communal information building and competence sharing:

- the assignments will be suitable for online learning and can be completed online either individually or in collaboration with other students.

8. Recommendations for the Principles for Cross-Studying to Achieve 15 Credits

The offered courses will appear as a harmonic ensemble to the student. The principles for cross-studying should be confirmed by the partners in cooperation with one another:

1. the partners will agree on which parts of the modules will be offered virtually. Mutually, they will also agree on the courses offered per academic year. Each partner will offer at least one part of a module per semester;
2. the offered courses will be compiled on a joint website to be viewed by the students. The website will display implementation plans and registration instructions, as well as the necessary tools and contact information;
3. students will ascertain the suitability of the studies to their study programmes at their respective universities or educational institutions;
4. students will register at a university or educational institution offering the studies. This will involve filling out a form, available on the website, by the appointed deadline;
5. the implementation will involve a learning platform provided by the university or educational institution and appointed tools will be used for working on the studies;
6. during the implementation, the provider of a module or any part of it will assume responsibility for student guidance in terms of content and technique;

7. the overall assessment of a module or part of it will be completed within one month after the module ends,

8. the university in charge of implementation will forward each student assessment to the student's home university or educational institution within one month after the module or part of it ends,

9. the modules or parts of them implemented in the EDU-RAIL project will be licensed with either the CC BY-NC-ND or the CC BY-SA license, or © All rights reserved (https://creativecommons.org/licenses/)

9. Sources

eAMK. 2017. Verkkototeutusten laatukriteerit. http://www.eamk.fi/fi/opintotarjonta/laatukriteerit/
eAMK. 2017. Quality Criteria for Online Implementations.
http://www.eamk.fi/en/courses-offering/quality-criteria/
The common principles for EDU-RAIL cross-learning:
https://forms.office.com/Pages/ResponsePage.aspx?id=RfDS-0yzc0aVNI8jdDVc7PcTdYz4inJOr6fxwmEKBeRUOTFJQjQ2VDBEWThQWjI5TFFSNzBTWThORC4u
Salmon, G. 2017. Carpe Diem – A team based approach to learning design.
https://www.gillysalmon.com/carpe-diem.html
Creative Commons: https://creativecommons.org/licenses/

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10. Annex 1. EDU-RAIL Inquiry: Questions and Answers

1. Describe the target groups of your EDU-RAIL module		
Answer 1	**Answer 2**	**Answer 3**
Railway operating companies, railway infrastructure companies, railway-related authorities and regulators, consultants and railway vocational education and training (VET) organisations	All driver students	Students of the EDU-RAIL partners; elective studies for students at a university of applied sciences (UAS) in the final stages of their studies oriented towards the railway sector. Suitable for all partners, reflecting the transformation of the operational environment of the railway sector as competition is opened to it. Suitable also for the staff off organisations involved in the competitive tendering of continuing education.
2. What is the starting level required by the students?		
Answer 1	**Answer 2**	**Answer 3**
Basic knowledge of railways and railway systems	At least secondary level studies completed either in high school or vocational school (Finland).	Very suitable for the UAS profiling third-year studies. At the professional level, suitable for people already employed by the sector: e.g. maintenance, rolling stock, operating and infrastructure.
3. The goal is for EDU-RAIL modules to be freely available to the students of the project partners. How will this be enabled by your module?		
Answer 1	**Answer 2**	**Answer 3**
Access will be the same for all EDU-RAIL modules: xx	The structure of the module is easily	At HAMK, the UAS Presidents signed a document in 2017, enabling

will save all outcomes of the EDU-RAIL partners and process them after the project ends. For access during the third year, it will be necessary to have approval from the leading partner of the module. After that is obtained, xx will open limited time access.	delivered to students, but its content will have to be modified in every country, --> different national rules!	cross-studying. This goes by the name of the "eAMK project". Agreements concerning cross-studying can be made by the same principles with the EDU-RAIL project partners. From the partners, this entails implementation in English along with the provision of access to virtual participation, lectures and group work.
4. What are the critical issues for making the modules available to the student of other partners in the project?		
Answer 1	Answer 2	Answer 3
Functioning of the EDU-RAIL administration outputs after the project ends.	All national rules or those of the operators.	Subject to agreement on the flexible acceptance of a student to study at another institution and a flexible procedure for getting the right to study into the data and data systems of the partner institution. In addition, virtual learning must be enabled. Assessments must be transferred to the student's home university in nearly real time. Crediting the assessments should be flexible at the student's home university (e.g. mutually agreed numbers of credits).
5. What kind of digital tools are you going to use for your module? Specify at least a learning platform (LMS), online materials, web conferencing tools and group work tools. Do you have any other special application that is needed? If so, please		

name it.		
Answer 1	**Answer 2**	**Answer 3**
The Centre for Occupational Safety (TTK) has access to Moodle and related tools. Skype is also available.	Optima.	Moodle, Skype or WebEx, materials planned for online learning: brief lecture-like spots, which articulate activating tasks, authentically real-time group work between groups. Classrooms need access to real-time virtual studies: e.g. through microphones placed in the classroom so that the distance learning student can hear the discussion and be a virtual part of the class.

6. **How do international students enrol in your module? What kind of information do you need for students to enrol?**

Answer 1	**Answer 2**	**Answer 3**
Students have to do the following: 1. Verify their home university, 2. Indicate which courses they wish to register for, 3. Agree to the terms of use for output that is classified under intellectual property.	Only by participating in our courses. Most of our module content is specialised in the operations of our national operator	Students are accepted in the same way as students of the open UAS are accepted. For the partner universities, studies are free of charge. Students must give notice of each course or module they wish to apply for, along with the name of the degree programme offering the course or module. In addition, the students fill out a registration form indicating their name, personal identification number, and contact

		information, as well as their nationality, native language, educational background and completed degree/degrees.
7. How do you evaluate the performance of international students in your module?		
Answer 1	**Answer 2**	**Answer 3**
It is necessary to develop this issue. Questionnaires may have to be developed for future users. One question that is still open is this: "Who will follow?"	By exam; not ready yet.	The studies are assessed on a scale of 1–5. Students get a document in English about the completion of a course or module and with this they can apply to get credits for their degrees at their respective universities. Flexible, real-time progression of study attainments should be agreed with the partner universities.
8. What kind of guidance could you provide for virtual students?		
Answer 1	**Answer 2**	**Answer 3**
The Institute of Logistics may be able to provide support. However, it is problematic again, so the project is closed. Partly, the outputs are in need of upgrading. Both the legislation and the normative rules are in dynamic change.	Don't know; haven't discussed this yet	Tutoring in studies and questions related to applying for such. The questions of how the modules will be carried out and how the students will participate in the studies in practice should be covered at the beginning of the studies. Group work can be offered distance guidance at appointed times. Both interim feedback and final feedback can be

		given on the tasks.
9. What kind of technical support is available if needed?		
Answer 1	**Answer 2**	**Answer 3**
Theoretically, the Institute of Logistics of the TTK might give some technical support	Optima system.	The students will be made familiar with the HAMK data systems and, for instance, Moodle, Skype and WebEx access. At the beginning of the studies, students will get electronic data processing (EDP) user names and passwords. IT guidance for accessing the systems will be available to students. Challenges may be encountered if the students have different kinds of computers (e.g. Mac). During office hours, case-specific support will be available for IT challenges. Students will be personally responsible for ensuring that the speeds of their internet connections are sufficient. The groups will agree amongst themselves on the working methods of group work and the tools to be used therein.
10. Would you like to raise any other issues? If so, what?		
Answer 1	**Answer 2**	**Answer 3**
It will be necessary to approve the tools of access at both the beginning and	No issues.	The partner universities should agree amongst themselves on registration procedures, which

the end.		should preferably be of the same type at the various universities. In addition, they should agree on flexible and rapid transfer procedures between universities following the courses. Registration should not entail, for example, passport data. The personal identification number should be sufficient identifying data. One issue that could be brought up is the question of whether the universities should have common pages and instructions about the courses or whether the universities should offer these studies independently.

Annex 2. Daily Programme for Module 3 and Summary Tables for Modules 1,2,4,5

Module 3 related material for daily programme

Passenger Rail Transport Opens to Competition

Theme 1, Market

The Opening Railway Market

The passenger traffic market is changing through a tendering process in the big Helsinki area by year 2021. The long distance train market will be open for the competition in 2024. What kind of changes can we expect? The freight market opened to competition in 2007. What kind of changes have we seen because of that? What is the situation today? How are the changes reflected in the traditional railway professions in the labour market?

Lecture 1   12:00–16:00

Theme   The General Framework

Learning objective

By means of a lecture + discussion, to go through the essence of the legislative transformation brought about by the EU Railway Packages. The objective is for all who attend the lecture to gain an understanding of what opening the markets to competition means and what is at stake.

Learning environments and teaching materials

A classroom/virtual classroom, a projector, PowerPoint (PP) material, small group discussions, a flip chart.

Teaching and guidance methods

With the help of a projector, show in appropriate bits the background of competitive tendering and its progress through time, interspersed with group discussion and learning the issues at hand together.

Learning assessment and feedback

Observe the small group discussions in progress and how the topic is absorbed.

Task between lectures

As a self-learning task, everyone watches a video (from minutes xx:xx to minutes yy:yy) of the press conference held by the Ministry for Transport and Communication on 9 August 2017.

https://www.youtube.com/watch?v=fHUW9z_jbFg&feature=youtu.be

Learning objective

Through self-learning, to acquire the underlying information for an exercise in plans for launching competitive tendering, the roles of the various parties, the envisaged schedules and the main concepts.

Lecture 2   12:00–16:00

Theme   On Competition and Tendering. Experiences of other Countries. /Honkatukia

Learning objective

To gain a general understanding about the differences between the tendering models presented in the lecture and how these tendering models have been used in different countries.

Learning environments and teaching materials

A classroom/virtual classroom, small group work, a projector, PowerPoint (PP) material.

Teaching and guidance methods

As graphically as possible, go through the theory of competitive tendering and the experiences of other countries. Open discussion with some questions as follows: What is the difference between the various tendering models? Which tendering models have been used in other countries?

Learning assessment and feedback

Observe the small group discussions in progress and how the topic is absorbed. Observe how group members participate in the small group discussions as well.

Lecture 3   12:00–16:00

Theme   Some conditions for the introduction of competition (MTC working group 2009–2010), conclusions and recommendations (MTC 21/2012), and recommendations (Honkatukia)

Learning objective

To gain a practical perception of the tendering environment and how long the Ministry was involved in sustained background work that progressed in stages. To compare the report by the working group of the Ministry and account given by Honkatukia. To make personal observations on the sustained preparatory work, the measures taken and the implementations. To arrive at some personal conclusions about the preparatory work of competitive tendering.

Learning environments and teaching materials

A classroom/virtual classroom, small group work, a projector, PowerPoint (PP) material.

Teaching and guidance methods

Stimulate discussion and coach/guide observations and notes.

Learning assessment and feedback

Observe the small group discussions in progress and how the topic is absorbed. Observe how group members participate in the small group discussions as well.

Exercise

Form groups and give the groups the topics of the exercises.

Lecture 4   12:00–16:00

Theme   Tendering postponed by new contracts. Passenger rail transport opens to competition: Press release, 09.08.2017 (short). Press release, 09.08.2017 (long). Fact sheet 73/2017 (published 9.8.2017). Fact sheet 74/2017 (published 9.8.2017). Fact sheet 77/2017 (published 17.8.2017).

Learning objective

> To become familiar with the material of the press conference held on 9 August 2017 and, through the material, with the phasing and the objectives of competitive tendering.

Learning environments and teaching materials

> A classroom/virtual classroom, small group work, a projector, PowerPoint (PP) material.

Teaching and guidance methods

> Stimulate discussion and coach/guide observations and notes.

Learning assessment and feedback

> Observe the small group discussions in progress and how the topic is absorbed.
> Observe how group members participate in the small group discussions as well.

Task between lectures

> **As a self-learning task, everyone watches a video (from minutes xx:xx to minutes yy:yy) of the press conference held by the Ministry for Transport and Communication on 9 August 2017.**

https://www.youtube.com/watch?v=fHUW9z_jbFg&feature=youtu.be

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Lecture 5   **12:00–16:00**

Theme   **The MTC notification regarding the upcoming tendering of commuter transport (Tenders Electronic Daily (TED) (15.09.2017). VR aims for a strong position in competitively tendered passenger services. Carnegie report no. 1 and Carnegie report no. 2**

Learning objective

> To become familiar with the notification of the competitive tendering of regional rail transport in southern Finland, given by the Ministry in compliance with the TED notification procedure, and the bulletin by VR Group Ltd, on the basis of which VR Group Ltd is aiming for a strong market position in tendered transport. The lecture focuses on becoming familiar with the Carnegie reports 1 and 2, which were provided for the Ministry as preparatory studies.

Learning environments and teaching materials

> A classroom/virtual classroom, small group work, a projector, PowerPoint (PP) material.

Teaching and guidance methods

> Stimulate discussion and coach/guide observations and notes.

Learning assessment and feedback

Observe the small group discussions in progress and how the topic is absorbed. Observe how group members participate in the small group discussions as well.

Lecture 6   **12:00–16:00**

Theme   **Regional reviews of passenger rail transport (Preparatory studies for the preparation of the introduction of competition to passenger rail transport, Ramboll/Strafica). Experiences in the introduction of competition (VR Group Ltd).**

Learning objective

> To become familiar with the competitive tendering background material made by the Ramboll/Strafica consulting group, as well as the experiences of tendering processes already carried out in different European countries, compiled by VR Group Ltd.

Learning environments and teaching materials

>A classroom/virtual classroom, small group work, a projector, PowerPoint (PP) material.

Teaching and guidance methods

>Stimulate discussion and coach/guide observations and notes; listen.

Learning assessment and feedback

>Observe the small group discussions in progress and how the topic is absorbed.

>Observe how group members participate in the small group discussions as well.

Task between lectures

>**As a self-learning task, everyone watches a video (from minutes xx:xx to minutes yy:yy) of the press conference held by the Ministry for Transport and Communication and the Helsinki Regional Transport Authority (HSL) on 4 October 2017.**

>**https://www.lvm.fi/passenger-rail-transport-opens-to-competition**
>**https://www.youtube.com/watch?v=9J-HJ-**

jJsEI&feature=youtu.be Information event on competitive tendering of the regional train services in southern Finland

Learning objective

>To reflect on everything learned by writing 2–3 pages (.doc/.docx). The next lecture will begin by discussing the topic of the task between lectures together.

Lecture 7   12:00–16:00

Theme   The summary lecture, "The Opening Railway Market", and Sirpa Pietikäinen's interview (National Coalition Party (KOK)), a Member of the European Parliament, on the subject, "The EU may not necessarily obligate Finland to tender rail transport".

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Learning objective

To go over the main parts in summary. To measure learning.

Learning environments and teaching materials

A classroom/virtual classroom, small group work, a projector, PowerPoint (PP) material.

Teaching and guidance methods

Stimulate discussion and coach/guide observations and notes; listen.

Learning assessment and feedback

Observe the small group discussions in progress and how the topic is absorbed.

Observe how group members participate in the small group discussions as well.

Lecture 8   12:00–16:00

Theme   Exam

Learning objective

To provide a written presentation in the exam of the competency acquired during the course.

Learning environments and teaching materials

A classroom/virtual classroom

Teaching and guidance methods

Supervision

Learning assessment and feedback

Exam assessment on a scale of 1–5 + peer assessments of the assignments (group

work) = total course assessment

Collect student feedback + development ideas about the course

MODULE 1 Single European Railway Area	
Total volume of the module	15 credit points
General objective of the module	- to acquire the skills of applying the main documents of the sphere of the EU transport policy according to the tasks of development of the particular transport organizations; - to introduce students to the key principles of transport policymaking in an international context; - to provide students with an understanding of the fundamentals of rail transport planning in the context of wider policy making; - to equip students with a conceptual and practical understanding of rail transport appraisal
E-learning subjects,	e-learning materials

Introduction. Content of EDU-RAIL project	
EDU-RAIL project. Brief description.	Text
Structure of training programme	Text
Website of project	Hyperlink
General objective and outcomes of the module "Single European Railway Area"	Text

1. European Transport Policy	
Transport Policy Formulation and Implementation	Text. Presentation. Transport policy. Basic principles. Presentation. European policy on intermodal transport Textbook. Transport Policy Formulation and Implementation
White paper 2011. Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system	Text White Paper 2011. Official documents of European Commission. White Paper 2011. Presentation.
TEN-T and transport policy	Text TEN-T core network corridors. Official documents of European Commission. TEN-T European Core Network Corridors. Map TEN-T European Core Network Corridors (Video)
2. Legislation of Single European Railway Area	
Railway packages	Text Towards Single European Railway Area. Presentation Digital Single European Railway Area. Presentation
First railway package	Text First railway package. Official documents of European

	Commission.
Second railway package	Text Second railway package. Official documents of European Commission. Second railway package. Hyperlink.
Third railway package	Text Third railway package. Official documents of European Commission. Third railway package. Hyperlink.
Fourth railway package	Text Fourth railway package. Official documents of European Commission. Fourth railway package. Hyperlink. Directive 2012-34-EU -- Establishing a Single European Railway Area Single European Railway Area (Video)
3. Single European Railway Area content	
E-learning material (title) 1	Text The Future of Rail in Europe (video) European Railway System. Part-1. Textbook European Railway System. Part-2. Textbook

	European Railway System. Part-3. Textbook
	Digital Single European Railway Area-1. Textbook
	Digital Single European Railway Area-2. Textbook

4. European Railway Governance	
European Railway Agency	Text European Railway Agency. Hyperlink
The European Rail Network for Competitive Freight	Text Regulation EU 913/2010 - European Rail Network for Competitive Freight. Official documents of European Commission.
E-learning material (title) n	Type of e-learning material (Presentation, Text book, Official documents of European Commission, Hyperlinks to websites, Multimedia)

5. Rail Research and Innovation in Europe	
Shift2Rail	Text Shift2Rail. Hyperlink Shift2Rail. Video
Rail Research and Shift2Rail	Text

	Council Regulation No 642/2014 of 16 June 2014 establishing the Shift2Rail Joint Undertaking Файл
	Shift2Rail: driving innovation on railways. Textbook
	European Transport Research and Innovation. Textbook
	Research for a Smart and Competitive Railway System. Textbook

Assessment Centre	

Additional information	
*Module 2. General professional knowledge and requirements regarding the license	Text Hyperlink to e-learning materials of Module 2.
*Module 3. Service Oriented and Intelligent Transport System in the Context of Opening Markets	Text Hyperlink to e-learning materials of Module 3.
*Module 4. Control and Command Systems of Rail Traffic	Text Hyperlink to e-learning materials of Module 4.

*Module 5. Logistic Management and Operating of Rail Transport	Text Hyperlink to e-learning materials of Module 5.

*the sections describing the related parts of other modules

MODULE 2 General Professional Knowledge and Requirements	
General objective of the module	The objective of the "general training" is to provide "general" competence on all aspects that are relevant to the train driver's profession and other railway safety related aspects. The general training in this respect will focus on basic knowledge and principles that are applicable independently of the type and nature of rolling stock or infrastructure.
Subjects of the module	1. Professional Knowledge of Safety Principles 2. Professional Knowledge of Trains and Rolling Stock 3. Professional Knowledge of Railway Technologies 4. Dangerous Goods 5. Dangerous Goods
Selected E-learning subject: The General Training objectives and e-learning	
Covered ECTS	*The course is expected to provide 3 ECTS, comprising 16 academic hours of face-to-face instruction and 62 academic hours of independent study.*

Type of learning material -learning material (Presentation, Text book, Official documents of European Commission, Hyperlinks to websites, Multimedia)	Text book
Learning objectives	**General objective:** acquiring the knowledge and procedures regarding of railway technologies, including safety principles and the philosophy behind operational regulations; - acquiring knowledge and procedures regarding the risks related to railway operation and the various means to be used to combat them; - acquiring knowledge and procedures regarding the principles guiding one or more railway operating modes; - acquiring knowledge and procedures regarding trains, their composition and technical requirements on traction units, wagons, coaches and other rolling stock.
Learning outcomes	**Learning outcomes** Student can: - understand the specific requirements for working in the professio of driver, its importance, and the professional and person demands (long periods of work, being away from home, etc.); - apply staff safety rules identify rolling stock know and apply

	working method in a precise manner; - identify the reference and applications documents (manual procedures and manual of lines as defined the 'Operations' TSI driver's manual, breakdown manual, etc.); - learn behaviours which are compatible with safety-critical responsibilities; - identify the procedures applicable to accidents; - involving persons distinguish the hazards involved in railway operations in general; - know the principles governing traffic safety; - know the principles of electric technology
E-learning environment e.g. Moodle or other	- Activity braking curves - Rolling stock monitoring instruments in Finland - 8 scenarios are presented in special folders. For every scenario is defined what competence the trainee has to acquire, the purpose and content of the scenario, what does the trainee to learn, procedures the trainee has to implement, communication before driving, evaluation of the trainees problem solving capability during this exercise.
Links to study materials	https://edukouvola.sharepoint.com/sites/krao-extranet/Sivut/default.aspx NB: must have KRAO permission to pages
Assessment of achieved	KRAO has its own generated assessment process. It is based on continuous observations from instructors and progress checks during

knowledge	training. All theoretical tasks have its own exam after study learning process.
	Practical learning starts after theoretical studies are over. Assessment continues in daily works, based by EU driver directive. KRAO has created electrical monitoring system for observation.
	In the end of the driver course, trainee must proof his/her knowledge and driving skills to inspector.

MODULE 4: Control and Command Systems of Rail Traffic	
General objective of the module	The aim of the course is to provide students with fundamental knowledge of Control and Command Systems of Rail Traffic. Consider different types of traffic management systems, to analyse their structure and basic safety solutions.
Subjects of the module	Subject 2. Policy and regulations in the Rail Transport
Selected E-learning subject: Policy and regulations in the Rail Transport	
Covered ECTS	*The course is expected to provide 4 ECTS, comprising 8 academic hours of face-to-face instruction and 56 academic hours of independent study.*
Type of learning material - learning material (Presentation, Text book, Official documents of European Commission,	Text book Official documents of European Commission Hyperlinks to websites

Hyperlinks to websites, Multimedia)	
Learning objectives	The aim of the course is to provide students with fundamental knowledge of control and command systems of rail traffic. Consider different types of traffic management systems, to analyse their structure and basic safety solutions.
Learning outcomes	For a passing grade, a student must: – know basic international treaties in the field of international passenger transportations (СМПС, КОТИФ/ЦИВ); – know basic parameters for the following subsystems: infrastructure (track and track facilities), rolling stock (locomotives and passenger wagons, motor wagon rolling stock) Competences and skills For a passing grade, a student must: – know interoperability policy bases and technical specifications structure, it application features on the bases of contact group ОСЖД/ЕЖДА work in the interaction of railway system track 1520mm/1435mm; – be able to navigate in the international organizations normative-technical documentation in the field of railway (ОСЖД, ОТИФ, МСЖД) and know basic tendencies of development
E-learning environment e.g. Moodle	Moodle Platform

Links to study materials	Intranet network of RTU
Assessment of achieved knowledge	Exam test

MODULE 5: Logistics Management and Operating of Rail Transport	
General objective of the module	This module provides a common understanding of the railway system, management and technology required for sustainable and intelligent rail freight system operation and design. The developed module within the learning material is used for formal and continuing education for all partners of this project
Subjects of the module	The following themes have been highlighted: - Role of the Rail Transport in the Supply Chain - Policy and Regulations in the Rail Transport - Railway Freight Operations and Management - Railway Asset Management and Pricing - Rail Environment and Crew Management
Selected E-learning subject: Railway Asset Management and Pricing	
Covered ECTS	*The course is expected to provide 3 ECTS, comprising 16 academic hours of face-to-face instruction and 62 academic hours of independent study.*
Type of learning material - learning material (Presentation,	E –learning course

European Union
European Regional
Development Fund

Interreg
Central Baltic

EDU-RAIL

Text book, Official documents of European Commission, Hyperlinks to websites, Multimedia)	
Learning objectives	Railway Asset Management and Pricing is a submodule of project module 5, Logistics Management and Operating of Rail Transport. The learning objective of this submodule is the acquisition of knowledge of railway management and pricing at a level corresponding to EQF level 6 for railway engineers, in particular, knowledge of asset management, price formation and calculation, and railway administration
Learning outcomes	Upon successful completion of the course, students will: • understand the asset-centric business model for railways, knowing how to acquire and use resources taking into account life-cycle costs, service quality and safety, and environmental impacts; • be familiar with price formation and calculation methods and be able to relate railway enterprise costs and revenue to assets and sources of financing; • have an overview of the legislative environment for the railway sector, including cross-border contracts, which they will then be able to use in the scope of their professional and occupational activities
E-learning environment e.g. Moodle	Moodle

Links to study materials	http://ekool.tktk.ee
Assessment of achieved knowledge	The results of achieved learning outcomes are given on the scale from 0 to 5. 5 - excellent 4 - very good 3 - good 2 - satisfactory 1 - sufficient 0 - insufficient