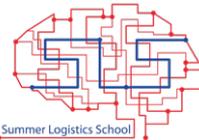


VET Level 4 in Logistics and Transport – A Training Handbook

- MARITIME AND INTERMODAL MANAGEMENT
- SUPPLY CHAIN MANAGEMENT OF COLD PRODUCTS
- WAREHOUSE ANALYSIS
- TRANSPORT ORGANISATION
- KEY SOFT SKILLS



Erasmus+



Developed as a part of the Summer Logistics School (SLS) project.
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1. Introduction

In their conclusions on a strategic framework for European cooperation and training (ET 2020), the Council of the European Union emphasise that "education and training have a crucial role to play in meeting the many socio-economic, demographic, environmental and technological challenges facing Europe and its citizens today and in the years ahead" and that "efficient investment in human capital through education and training systems is an essential component of Europe's strategy to deliver the high levels of sustainable, knowledge-based growth and jobs that lie at the heart of the Lisbon strategy, at the same time as promoting personal fulfilment, social cohesion and active citizenship." (EU 2009).

Education and training have already made a substantial contribution towards achieving the above long-term goals. However, efforts should be maintained to ensure that education and training remain flexible enough to respond to both current and future challenges in this global environment. Accordingly, the Council of the European Union (2009) defined the following objectives:

1. making lifelong learning and mobility a reality,
2. improving the quality and efficiency of education and training, and
3. enhancing creativity and innovation at all levels of education and training.

The need to **update and develop skills** in line with changing economic, social, and global circumstances calls for education and training systems which are **more responsive to change** and more open to the world. Further efforts are also required to make learning more attractive through the development of **new forms of learning** and **the use of new teaching and learning technologies**.

Greater attention needs to be paid **to increasing the level of computer and soft skills** and **to strengthening language competences**. At the same time, there is a need to supply **high quality teaching**

(through comprehensive teacher education and continuous professional development opportunities for teachers and trainers) and to focus on the skills and competences required in the labour market. Creativity and innovation are crucial to enterprise development and, consequently, to Europe's competitiveness (EU, 2009).

Many European and other projects were designed to bridge these gaps. So far, many goals have already been achieved in various fields of education. However, there are still many education areas that need to be improved. One of them is vocational education and training (VET) in logistics and transport.

The supply chain and its management are extremely important to the success of businesses operating in today's local and global markets. Moreover, the success of any supply chain greatly depends on the performance of logistics activities (transport, warehousing, added value services, inventory management, etc.) supplied by different providers. Efficient performance depends on many factors, including quality and competent human resources.

To update skills and to raise the level of competences in the field of VET in logistics and transport, the Summer Logistics School (SLS) project has pooled ten partners (two faculties, six secondary schools, and two institutes) from four different countries (Slovenia, Italy, France, and Croatia) with the aim to:

- promote the modernisation of VET in logistics in the partner countries (modernisation of curricula),
- upgrade and develop new competences of students of secondary logistics and transport schools (EQF Level 4), and
- foster the quality of teachers at secondary logistics and transport schools (EQF Level 4).

To reach these goals, a four-step approach was used. In the first step, a SWOT analysis of the current curricula and training methods of VET in logistics and transport in the project countries was made. Then, the satisfaction of the transport and logistics industry with students who graduate from VET in logistics and transport was analysed, and the current and future needs of the transport and logistics industry were identified. Based on the results of the first two steps, a training programme was developed for students and teachers of VET in logistics and transport in order to reduce or minimise the identified weaknesses of the analysed curricula.

The training programme consists of five relevant training modules (TMs):

1. **MARITIME AND INTERMODAL TRANSPORT**
2. **SUPPLY CHAIN MANAGEMENT OF COLD PRODUCTS**
3. **WAREHOUSE ANALYSIS**
4. **TRANSPORT ORGANISATION**
5. **KEY SOFT SKILLS**

In the last step of the project these TMs were tested through a six-day summer logistics school.

Therefore, the purpose of this **VET Level 4 in Logistics and Transport – a Training Handbook** is to help education and training institutions to prepare analogous summer schools in the future or to integrate some among the TMs or learning outcome units into their VET programme in logistics and transport. This Training Handbook is primarily designed for VET teachers in logistics and transport, for ministries and other governing bodies covering VET in logistics and transport, or for any other organisation that offers training in logistics and transport. It could serve as a guide for efficient preparation of curricula and may help achieve the desired goals in this field.

VET Level 4 in Logistics and Transport – a Training Handbook is divided into six sections. The Introduction is followed by the second chapter that presents the European Credit System for Vocational Education and Training (ECVET). A description of the SLS project with information about the project, the project priorities, aims, and activities, and the project consortium is given in the third chapter. Next, the fourth chapter brings the intellectual outputs of the first project activity: the analysis of secondary school curricula, and the analysis of semi-structured interviews conducted with experts from the logistics and transport industry. The fifth section brings detailed descriptions of the five TMs, the learning outcome units, and lesson plans related to the five qualifications deriving from each of these five TMs: maritime and intermodal management, supply chain management of cold products, warehouse analysis, transport organisation, and key soft skills in transport and logistics. The Handbook ends with the conclusion and a references section.

2. ECVET

The European Credit System for Vocational Education and Training (ECVET) is one of the instruments of the European Union which helps individuals in the transfer, recognition, and accumulation of their assessed learning outcomes to achieve a qualification or to take part in lifelong learning. ECVET also increases the employability of Europeans, calls for better transparency and mutual trust between educational systems and providers, and for more efficient and readable recognition of non-formal and informal learning. The European Parliament and the Council of the European Union adopted the ECVET recommendations in 2009 and invited European Union members to create the necessary conditions and adopt measures to apply the system to all VET qualifications.

The ECVET tools and methodology include:

1. a description of qualifications in terms of learning outcome units with associated points,
2. a transfer and accumulation process, and
3. complementary documents, such as learning agreements, transcripts of records, and ECVET user guides.

ECVET is based on a description of qualifications in terms of learning outcomes (knowledge, skills, and/or competences), organised into transferable and accumulable learning units to which credit points are attached and registered in a personal transcript of learning outcomes.

The term **qualification** (EQUAVET, 2019; Eurodyce, 2000) covers different aspects:

- a. formal qualification: the formal outcome (certificate, diploma, or title) of an assessment and validation process obtained when a competent body determines that an individual has achieved learning outcomes to given standards and/or possesses the necessary competences to do a job in a specific area of work. A qualification confers official recognition of the value of learning outcomes in the labour market and in education and training. A qualification can be a legal entitlement to practice a trade (OECD).

b. job requirements: the knowledge, aptitudes, and skills required to perform the specific tasks attached to a particular work position.

According to ECVET, as stated by the official terminology by the European Centre for the Development of Vocational Training (CEDEFOP), qualifications (competence standard) are expressed in learning outcome units to which credit points are attached, and combined with a procedure for learning outcomes validation.

A **Learning Outcome** is the set of knowledge, skills, and/or competences an individual has acquired and/or is able to demonstrate after the completion of a learning process, either formal, non-formal, or informal.

In particular, ECVET identifies a **Learning Outcome Unit** (EQUAVET, 2019; Eurodyce, 2000) (**LO Unit**) as "a set of knowledge, skills, and/or competences which constitute a coherent part of a qualification. A unit can be the smallest part of a qualification that can be assessed, transferred, validated and, possibly, certified. A unit can be specific to a single qualification or common to several qualifications. The characteristics of units (content, size, total number of units composing a qualification, etc.) are defined by the competent body responsible for the qualification at the appropriate level. The definition and description of units can vary according to the qualifications system and the procedures of the competent body."

ECVET Points (EQUAVET, 2019; Eurodyce, 2000) are "a numerical representation of the overall weight of learning outcomes in a qualification and of the relative weight of units in relation to the qualification. Together with units, descriptions of learning outcomes and information about the level of qualifications, ECVET points can support the understanding of a qualification. The number of ECVET points allocated to a qualification, together with other specifications, can indicate, for example, that the scope of the qualification is narrow or broad. The number of ECVET points allocated to a unit provides the learner with information concerning the relative weight of what s/he has accumulated already. It also provides the learner with information concerning what remains to be achieved."

The "sum" of the coherent descriptors represents a LO Unit. In order to assign a level of importance (in the context of the overall qualification) to each LO Unit, a "relative weight of importance" can be attributed to each LO Unit, based on three criteria: effort necessary for

acquiring competences, relevance of the working activities identified within the LO Unit, and time needed for teaching the corresponding competences.

Referring to the CEDEFOP definition (CEDEFOP, 2014), **competence standard** refers to the knowledge, skills, and/or competences linked to the practice of a job. **Competence** is the ability to apply learning outcomes adequately in a defined context (education, work, personal or professional development). **Knowledge** is the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories, and practices that is related to a field of study or work. **Skill** is the ability to perform tasks and solve problems.

3. The SLS project

3.1 Basic information about the project

Table 1: Project information

| Project title | Summer Logistics School |
|--------------------------------------|--|
| Project acronym | SLS |
| Project duration | 01.10.2017 – 30.09.2019 |
| Applicant organisation (coordinator) | University of Ljubljana (UL) |
| Programme | Erasmus+ |
| Key action | Cooperation for innovation and the exchange of goods practices |
| Action | Strategic partnership |

3.2 Project priorities and aims

The SLS project covered **two horizontal priorities**:

1. to achieve relevant and high quality skills and competences in VET in logistics and transport, and
2. to open and to innovate practices in the digital area.

A **VET priority** is to introduce systematic approaches and opportunities to the initial and continuous professional development of VET teachers and learners. The SLS project primarily aimed to upgrade and develop new and relevant knowledge, skills, and competences of students of secondary logistics and transport schools (EQF Level 4) in order to promote modernisation and foster the quality of VET in logistics and transport in the four partner countries (Slovenia, Italy, France, Croatia).

3.3 SLS consortium

The SLS Consortium included 10 partners: two faculties, six secondary logistics and transport schools (EQF Level 4), and two logistics institutes (*Figure 1*).

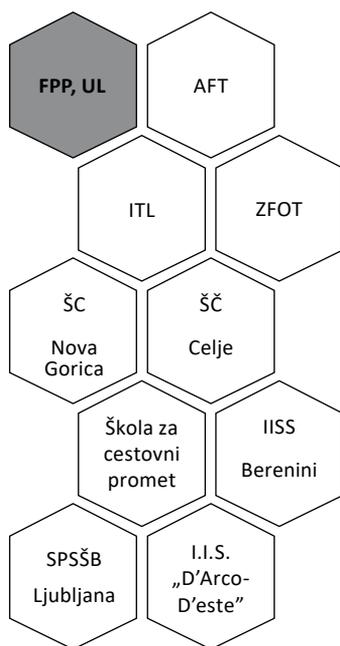


Figure 1: SLS partners

The **University of Ljubljana (UL)**, Slovenia, coordinator of the SLS project, was founded in 1919. It is the oldest and largest higher education and research institution in Slovenia. It encompasses 26 full members (three art academies and 23 faculties) and three associated members (National University Library, University of Ljubljana Central Technical Library, and University of Ljubljana Innovation-Development Institute).

On the European scale, by number of students, the UL ranks among the largest higher education institutions. According to the database Web of Knowledge, Thomson-Reuters, the university teachers and researchers of the UL regularly contribute almost 50% of all internationally acclaimed academic publications from the Republic of Slovenia.

The **Faculty of Maritime Studies and Transport (UL FPP)** (Figure 2) is a member of the University of Ljubljana. It is an education and training institution engaged in scientific and research work, primarily in the fields of transport and maritime studies. Currently it is employing approximately 30 highly educated scholars with highest academic titles, many of them experts in transport, logistics, marine engineering, and maritime navigation. UL FPP has modern hardware and software computer equipment and research laboratories for transport, logistics, and maritime education and science, complemented by a variety

of simulators for real-time simulations of real-life traffic situations, and navigational bridge/engine room simulators for the education and training of seafarers.



Figure 2: UL FPP logo

The **Institute for Transport and Logistics (ITL)** (Figure 3) from Italy is a research institute in the fields of mobility, transport, and logistics. It employs approximately 15 project managers. ITL is particularly active in EU research and cooperation projects. So far, it has been involved in more than 40 international/EU transport and logistics projects.

ITL develops research, pilot, and study activities in cooperation with public authorities and transport operators in the following fields: training in transport and logistics, city logistics, sustainable mobility, logistics platforms, transport and logistics services development, co-modality, rail and maritime transport, and supply chain management.

ITL is the Logistics Competence Centre (LoCC) in the Italian region of Emilia-Romagna and holds the Presidency of the European Network of LoCCs – EU Network of Logistics Competence Centres (Open EN-LoCC). In addition, it is a member of the European Network of Living Labs, the Associated Research Centre of the Volvo Research, the Educational Foundations Centre of Excellence for Sustainable Urban Freight Systems, and of the ITS Piacenza (Higher Technical Institute – EQF Level 5) on Sustainable Mobility, the only ITS in the Emilia-Romagna region focused on the transport and logistics sector.



Figure 3: ITL logo

Created in 1957 at the initiative of the French Transport Federation Union, **AFT Transport Logistique (AFT)** (Figure 4) is an organisation responsible for VET development in the transport and logistics industry. Its mission is to work for companies covered by the French national collective agreement for road transport (passengers/goods) and related activities, such as logistics and forwarding, as well as industrial and commercial companies with their own means of transport (private – or own-account – transport).

To successfully fulfil all its duties, AFT has as many as one hundred and thirty employees. It has signed cooperation agreements with the French Ministries for National Education, Higher Education, Transport, Labour, and Finance. It has created national and regional steering committees involving social partners, VET providers as well as public authorities dedicated to the VET policy.

AFT performs its basic role of developing VET in the transport and logistics industry by defining VET training needs and assessing the results, defining, designing, and updating VET programmes, cooperating with the French Ministry of National Education, developing European ECVET mobility, informing and advising the public (in particular young people and job seekers), and advising companies. AFT includes a Research and Study department with the aim to address future challenges.

Moreover, AFT is a member of several European networks and/or organisations: NETINVET (European network promoting and organising mobility for EQF Level 5 qualifications in international trade, transport and logistics), EUROTRA (European Transport Training Association), ELITE (European Logistics, Infrastructure and Transport Expertise Network), ELA (European Logistics Association), and IRU (International Road Union).



Figure 4: AFT logo

The **Faculty of Transport and Traffic Sciences (FPZ)** from Croatia (Figure 5), established in 1984, is a member of the University of Zagreb, and the leading higher education as well as scientific and research institution in the field of transport and traffic engineering in Croatia.

FPZ offers programmes in Traffic and Transport, Intelligent Transport Systems and Logistics, and Aeronautics. All programmes are taught at the three-year first-cycle (180 ECTS) and two-year second-cycle levels (120 ECTS). Postgraduate studies provide three-year third-cycle doctoral studies in the field of Transport and Traffic Engineering, as well as one-year specialist studies in Urban Transport and Traffic, Intermodal Transport and Traffic, and Transport Logistics and Management.

FPZ staff (190) participates in national, regional, and international scientific, research and development projects funded by the national Ministry of Science, Education and Sports, the European Commission,

and international institutions. In addition, FPZ participates in public and commercial projects on transport and traffic problems of the Croatian transport and logistics sectors.

The research carried out at FPZ is of a high international standard and has the goal of providing modern transport and traffic technology, infrastructure, logistics, and intelligent transport systems solutions in road, waterway, postal, information and communication, urban, air, and railway transport.



Figure 5: FPZ logo

The **School Centre Nova Gorica (ŠC NG)** (*Figure 6*) from Slovenia is one of the most important VET centres in Slovenia (2500 students at the secondary level, 300 students in further education college programmes, 300 adult students, and 260 teachers and other staff). It offers a wide variety of training and education programmes for youth aged 15-19 as well as for adults in computer science, mechanical engineering, electrical engineering, wood processing, and construction. It addition, it houses a grammar, healthcare, biotechnical, and economics and trade school.

Since 2005 ŠC NG has increased its offer to further education college programmes, for instance in information science, mechatronics, and agriculture. In the afternoons they organise a variety of education programmes, forms of training and certification of national vocational training, and tailor-made courses for adults, among them for job seekers.

Since 2003 ŠC NG has been successfully involved in the national programme of modernisation of education programmes. Recently they have started cooperating with different social partners (companies, the national Chamber of Commerce and Industry of Slovenia, and other chambers, the Employment Service of Slovenia, the Centre of the Republic of Slovenia for Vocational Education and Training, the Ministry of Education and Sport, the Ministry of Labour, Family and Social Affairs, the University of Ljubljana, regional development agencies, the Municipality of Nova Gorica, etc.) with the aim to improve vocational and professional education in Slovenia and to find common solutions for further development.



Figure 6: NG logo

I.I.S.S. Berenini (Figure 7) from Italy is a public science and technology secondary school (with about 800 students aged 14-18, and 100 members of staff) located in the small town of Fidenza in the province of Parma. Their students mainly come from local areas and towns but also include a minority of first and second generation immigrants.

I.I.S.S. Berenini is a state school, set in 1963. The school has been developing its curriculum by introducing new core subjects to comply with the local and regional community demands for specialised technicians but also to offer students a higher level of professional education. I.I.S.S. Berenini offers industry-oriented education to future electronics and mechatronics technicians, mechanics, or experts in chemistry, transport, and logistics. A new qualification was introduced in 2017 as a response to the demands of the local fashion manufacturing industries requiring specialised fashion designers.



Figure 7: I.I.S.S. Berenini logo

School Centre Celje (ŠC Celje) (Figure 8) from Slovenia is a public education institution, consisting of five secondary schools (Grammar School Lava, Secondary School of Chemistry, Electrical Engineering and Computer Engineering, Secondary School for the Services and Logistics, Secondary School of Civil Engineering and Environmental Protection, and Secondary School of Mechanical Engineering, Mechatronics and Media), one further education college with programmes in mechanical engineering, mechatronics, civil engineering, and automotive management, and an adult training centre – MIC, which provides education opportunities to adults and organises informal education programmes in different fields, such as digital literacy, practical training, language learning, etc.

ŠC Celje has over 3000 students in 30 programmes, 800 further education college students, over 1000 adults attending various programmes of formal and informal education and training, and more than 300 members of staff, most highly qualified teachers in various professional fields.

The mission of ŠC Celje is to provide students with developmentally appropriate education and to ensure high professional competences of their teachers as well as the best education conditions for their students. They successfully connect students coming from different social backgrounds, cultures, and nationalities, including migrants, adult learners, and other vulnerable groups (early school leavers, students with learning disabilities, etc.) by helping them to complete their education, find employment, and be in control of their lives.



Figure 8: ŠC Celje logo

The **Secondary Vocational and Technical School Bežigrad – Ljubljana** (SPSŠB) (*Figure 9*) from Slovenia is a vocational and technical school, founded in 1962, which prepares students to enter the labour market or continue their education. It provides programmes in the fields of logistics, textile industry, and mechanical engineering. The school offers two-year short-cycle vocational education programmes for assistants in technological processes and textile reworkers, three-year vocational secondary education programmes for car mechatronics, vehicle body repairers, industrial mechanics, metal shapers-toolmakers, tinsmiths-roofers, and dressmakers, three-plus-two vocational-technical education programmes for future mechanical engineering technicians, automotive service technicians, technicians of mechatronics, logistics technicians, and creators of fashion clothing, and four-year technical secondary education programmes for future logistics technicians, and creators of fashion clothing.

In the last ten years, the school has been actively involved in the process of reforming vocational and technical education in Slovenia, with a strong emphasis on mastering the key competences and in the light of closer cooperation between education and the labour market. The school has acquired a wealth of experience, which has helped the development of modern teaching methodology approaches.

The school offers unique and exciting learning opportunities by working closely with craftsmen and many different companies. In addition to the full-time education programmes, courses for adult education are provided.



Figure 9: SPSSB logo

The **Higher Institute “Carlo d’Arco” and “Isabella d’Este”** (Figure 10) was established in 2000 to reorganise and optimise school centres in the province of Mantua, Italy. The institute “Carlo d’Arco” was established in 1926 and has been a state school since the 1960s. The Institute “Isabella d’Este” was established in 1942, and became a state school in 1959.

Education programmes offered at the Higher Institute “Carlo d’Arco” and “Isabella d’Este” are Construction, Environment, and Territory (since 2010/2011), Graphics and Communication (since 2010/2011), and Transport and Logistics (since 2011/2012). In addition, the Institute houses the High School of Social Sciences, and the High School for Music and Dance.



Figure 10: »Carlo d’Arco« and «Isabelle d’Este» logo

The School for Road Traffic and Transport (ŠCP) (Figure 11) is a public secondary vocational school from Zagreb. The school was founded in 1949 and thus has a 70-year tradition in the education and training in road transport and logistics. It is the only exclusively road traffic and transport oriented vocational school in the Republic of Croatia. The activities of the school include the education of students acquiring secondary vocational qualifications (four-year programmes for road transport technicians and logistics and freight forwarding technicians, and a three-year programme for motor vehicle drivers), education of adults acquiring secondary vocational qualifications (motor vehicle driver, road transport technician, logistics and freight forwarding technician, and tram driver), professional training of adult students (driving instructor, vehicle roadworthiness supervisor, and supervisor of internal traffic control), professional training of adults (motor vehicle driver, transport of dangerous goods in road transport, and machinery and device operators), driving training, and publishing activity.

All courses are held by 60 experienced teachers, enabling the students and adult learners to complete the programme successful-

ly. Teachers regularly attend continuous professional development courses and training sessions, and are actively involved in projects and other forms of international cooperation.

The school programmes rely on the use of modern technology and are continuously upgraded in response to the demands of the labour market. All classes are held in well-equipped classrooms, specialised classrooms and labs, and in businesses. For the education and training of drivers, the school owns three cargo trucks and four cars. Good material and working conditions, and efficient planning of theoretical and practical training, exercises and exams provide the school with very favourable conditions for the education and training of full-time students and adult learners alike.



Figure 11: ŠCP logo

3.4 Project activities

The project aims were achieved through several project activities (Figure 12).

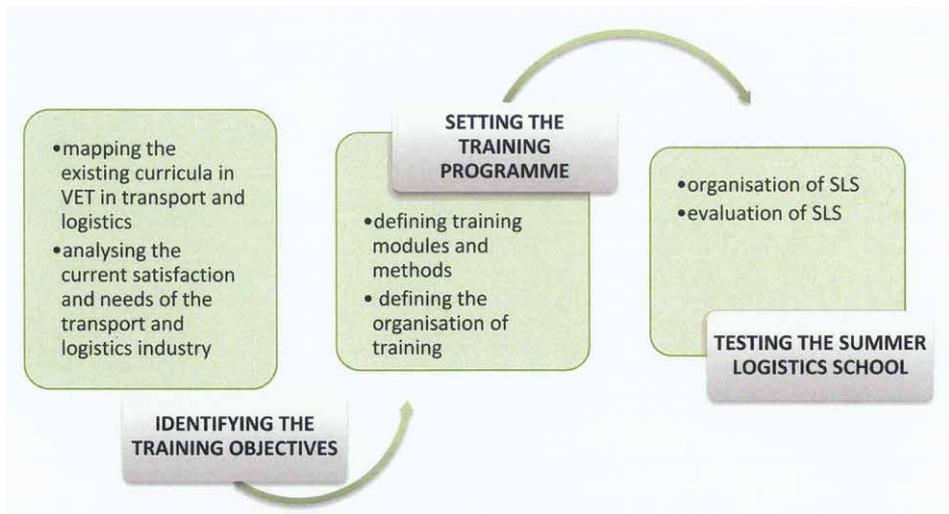


Figure 12: Project activities

3.4.1 Project activity 1

The **first project activity** entailed the mapping of existing national curricula of secondary logistics and transport schools (EQF Level 4) in all four project countries. For this purpose, a SWOT analysis was carried out by the four core partners (UL FPP, ITL, AFT, FPZ) in order to analyse and summarise the strengths and weaknesses of the existing curricula. The results of this analysis served as one of the two pillars for the establishment of the training programme of the Summer Logistics School.

The second pillar was provided by the results of the analysis of the existing needs of the transport and logistics industry in terms of the professional knowledge, skills, and competences of graduates from VET Level 4 programmes in transport and logistics. The core partners of the project conducted a total of 49 interviews in different, mainly logistics, companies with the aim to determine the level of knowledge, skills, and competences of newcomers, graduates from VET Level 4 in transport and logistics, and to highlight the knowledge, skills, and competences that merit further investigation.

The main Intellectual Outputs of the first project activity are: (1) analysis of secondary school curricula, and (2) analysis of semi-structured interviews with experts from the logistics and transport industry, presented in Chapter 4.1 and Chapter 4.2 respectively.

3.4.2 Project activity 2

To bridge the gap between the existing curricula and the industry needs, five TMs were designed in the **second project activity**:

- TM1 – MARITIME AND INTERMODAL MANAGEMENT
- TM2 – SUPPLY CHAIN MANAGEMENT OF COLD PRODUCTS
- TM3 – WAREHOUSE ANALYSIS
- TM4 – TRANSPORT ORGANISATION
- TM5 – KEY SOFT SKILLS

TM1 and TM4 were defined as the mandatory modules for the Summer Logistics School while the other three modules were defined as elective (TM2, TM3, and TM5). The duration of each mandatory TM was set at 12 hours, and the duration of each elective TM was set at 8 hours. The details of the content and applied teaching methodology

of each TM are described in Chapter 5. The methodology used for the definition of the competence standard relies on the ECVET system, presented in the second chapter.

The main Intellectual Output of the second project activity is the training programme of the Summer Logistics School that consists of five TMs and is presented in Chapter 5.

3.4.3 Project activity 3

In the **third project activity** the training programme was tested and evaluated through the organisation of the Summer Logistics School. Training focused on the use of digital tools, new training methods, and the presentation and construction of up-to-date knowledge and skills. The target groups were students and teachers from VET secondary schools in logistics and transport, employees from logistics and transport companies, and institutions in charge of VET. The Summer Logistics School was organised over six days.

The main Intellectual Outputs of the third project activity are: (1) the present Training Handbook, (2) the learning materials for the participants of the Summer Logistics School prepared by each trainer, and (3) the guidelines and templates for evaluating the Summer Logistics School. The last two intellectual outputs are published in separate documents as their scope reaches beyond this Training Handbook.

4. Identification of training objectives

The first project activity aimed to make an inventory of the current training offer at VET Level 4 in logistics and transport in the countries involved in the project and highlight its weak points, and to analyse the industry's needs in terms of professional knowledge, skills, and competences of EQF Level 4 graduates from logistics and transport. This chapter presents the results of the SWOT analysis of the secondary school curricula and the results of semi-structured interviews conducted with experts from the logistics and transport industry.

4.1 Analysis of secondary school curricula

To make an inventory of the current training offer at VET Level 4 in logistics and transport in the countries involved in the project, the project partners made a SWOT analysis of secondary school curricula in order to analyse their respective national training programmes and to identify and summarise the strengths and weaknesses of the existing curricula, as well as identify opportunities and threats.

In total, 14 secondary school curricula were analysed. Among the seven analysed in Croatia, six are linked with transport, covering every mode of transport (air, rail, road, waterway). One curriculum from Croatia merges logistics and transport. Three curricula were analysed in France: two are linked with transport while the third focuses on logistics. Next, three curricula were analysed in Italy: two are linked with transport while the third focuses on logistics, like in France. Finally, in Slovenia there is a single curriculum that is designed to cover both transport and logistics.

The following tables summarise the weaknesses of the existing training programmes. The results are presented separately for transport activities first and for logistics activities next.

Transport activities:

| Detected weaknesses of the current training offer | Minimal objectives of SLS training |
|--|---|
| Practical aspects | |
| <ul style="list-style-type: none"> • lack of specialised classrooms (CR¹) • lack of specialised tools (CR, IT), for example a traffic counter (CR) • lack of smart computer games and practical simulations of activities (SL, FR) | <ul style="list-style-type: none"> • SLS should develop work-based learning activities, such as putting the learner into a professional situation ("simulations"). • These activities should be easy to implement using cheap and "easy-to-acquire" equipment and material. |
| Simulation aspects | |
| <ul style="list-style-type: none"> • need for simulators for road traffic monitoring, air navigation, river navigation, traffic incident expertise, or cargo planning (CR) • lack of use of TMS (FR), no financial support for licenses (IT) | <ul style="list-style-type: none"> • We will have to determine if we are able to use professional/pedagogical software during SLS training. • We might use the simulators from the SIMULTRA project. |
| Up-to-date aspects | |
| <ul style="list-style-type: none"> • outdated vocational literature (CR, IT, SL) • difficulties of updating teachers (SL) | <ul style="list-style-type: none"> • SLS will have to include a module addressing teachers, to train them on new tools and methodologies, and to provide them with updated information, literature, etc. • Teachers will benefit from the new tools and methodologies developed within the project. |
| Curricula orientation aspects | |
| <ul style="list-style-type: none"> • curricula excessively focused on road transport (FR) • covering all transport modes depends on each school (SL) • navigation and mechanical aspects are slightly off-topic (IT) | <ul style="list-style-type: none"> • SLS needs to contain a unit/sub-unit on different transport modes, eventually also intermodal transport. • Theoretical knowledge. • The organisation of a transport mission using intermodal transport could be learned through a practical approach. |

1 CR – Croatia, FR – France, IT – Italy, SL – Slovenia.

| Language aspects | |
|---|--|
| <ul style="list-style-type: none"> • lack of practical and sectoral English (F, IT) | <ul style="list-style-type: none"> • SLS needs to propose professional English lessons. The context is more than appropriate since the participants come from different countries and will need English to communicate with each other. |
| Teaching methodology and assessment aspects | |
| <ul style="list-style-type: none"> • teaching realised by direct instruction (IT, FR) • assessment not realised by checking operational skills and/or simulation activities | <ul style="list-style-type: none"> • SLS needs to put into place new methodologies of assessment that focus on the evaluation of operational skills and competences. • When developing simulation and work-based learning activities, SLS partners will have to include this aspect into their work. |
| Work placement aspects | |
| <ul style="list-style-type: none"> • insufficient time and sometimes not based on activities linked to the sector (all) | <ul style="list-style-type: none"> • In the framework of SLS it will not be possible to organise work placement but possibly one or several company visit(s). • However, we will develop simulation and work-based learning activities that allow the acquisition of practical skills and competences. |

Logistics activities:

| Detected weaknesses of the current training offer | Minimal objectives of SLS training |
|--|--|
| Practical aspects | |
| <ul style="list-style-type: none"> • lack of specialised classrooms for warehouse activities, supply chain activities, loading and unloading operations (CR, IT) • topics such as warehousing hard to teach because too theoretical in teaching support and materials (CR) • lack of equipment (CR) | <ul style="list-style-type: none"> • SLS should develop work-based learning activities such as putting the learner in a professional situation ("simulations"). • These activities should focus on the ones that are easy to implement using cheap and "easy-to-acquire" equipment and material. • Practical activities should cover warehouse activities, supply chain activities, loading and unloading operations. |

| Simulation aspects | |
|---|--|
| <ul style="list-style-type: none"> • lack of use of WMS (FR, CR), no financial support for licenses (IT) | <ul style="list-style-type: none"> • We will have to determine if we are able to use professional/pedagogical software during SLS training. • We might use the simulators from the SIMULTRA project. |
| Up-to-date aspects | |
| <ul style="list-style-type: none"> • outdated vocational literature (CR, IT, SL), no expert manuals or textbooks (CR) • difficulties of updating teachers (SL) | <ul style="list-style-type: none"> • As stated above, SLS will have to include a module addressing teachers to train them on new tools and methodologies and to provide them with updated information, literature, etc. • Teachers will benefit from the new tools and methodologies developed within the project. |
| Curricula orientation aspects | |
| <ul style="list-style-type: none"> • lack of practical and sectoral English (IT) | <ul style="list-style-type: none"> • SLS needs to propose professional English lessons. The context is more than appropriate since the participants come from different countries and will need English to communicate with each other. |
| Teaching methods and assessment aspects | |
| <ul style="list-style-type: none"> • teaching realised by direct instruction (IT, FR) • assessment not realised by checking operational skills and simulation activities (CR, SL) | <ul style="list-style-type: none"> • SLS needs to put into place new methodologies of assessment that focus on the evaluation of operational skills and competences. • When developing simulation and work-based learning activities, SLS partners will have to include this aspect into their work. |
| Work placement aspect | |
| <ul style="list-style-type: none"> • insufficient time and sometimes not based on activities linked to the sector (all) | <ul style="list-style-type: none"> • In the framework of SLS it will not be possible to organise work placement but maybe one or several company visit(s). • However, we will develop simulation and work-based learning activities that allow the acquisition of practical skills and competences. |

To summarise, the main areas that call for changes and were improved through the complementary Summer Logistics School programme are:

- 1. Disparate contents.** Differences in the content of the training offer were identified among the countries involved in the project. While in the Croatian case the curricula appear to be complete and cover both basic (language, mathematics, etc.) and specific knowledge and skills, this is not the case in Italy or Slovenia. In the Italian case there are relatively large gaps, for example concerning the knowledge of geography, or the development of logistics. In Slovenia, it was pointed out that not all modes of transport were covered by all schools. As far as professional and “sectoral” knowledge is concerned, it is vital that the training content in the sector concerned, in this case transport and logistics, is both varied and comprehensive. If the training does not sufficiently cover the core aspects of the future job, such as logistics in the case of Italy, or if a mode of transport has not been sufficiently addressed like in the case of Slovenian schools, this may jeopardise the insertion of national students into the labour market. In addition, such disparities in content could be detrimental to learners in terms of their geographic mobility. The current labour market often requires national mobility, and more and more international mobility. This disparity in content causes, in terms of mobility, a competitive advantage or disadvantage for students from some countries, depending on the level of education they have completed during their formal education.
- 2. Lack of simulation and practical work.** Simulation can be defined as putting learners into a professional situation (work-based learning), so that they can develop methods and reflexes that they must have in the professional lives to which their curriculum leads. The lack of simulation is a remark that came up in several national reports. In the field of transport and logistics, simulations can be performed through the use of simulation games, but also through the use of professional software in a pedagogical way. Indeed, this software will be used in the future professional lives of the learners. The most common are the Warehouse Management System (WMS) for logistics, and the Transport Management System (TMS) for transport activities. However, various publishers market their own TMS and WMS, so it is difficult to offer specific software courses when in reality another software will be used in the company in which the learner will work. Another challenge is the price of software licenses (this point was highlighted in the Italian report), as well as the teachers' ability to use these tools and thus to teach their use properly.

The lack of simulation is related to the lack of practical implementation, which is another weakness of the current training offer. This is considered to be addressing the major topics and rules of transport and logistics, but also to be excessively limited to factual knowledge, with often too weak or even non-existent practical hand-on experience and learning.

The analysis of the Croatian partners revealed that their education offer is indeed too limited to theoretical considerations. There is no scenario related to events that may occur in one's everyday working life. All partners stressed the fact that work placement periods exist in their countries and are mandatory in the context of training. Nevertheless, even if these are mandatory, the Croatian partners have, for example, highlighted that the content of work placement is not controlled. The students' internships are often limited to tasks unrelated to their training or the jobs for which they are trained (in more concrete terms, students may be asked to do cleaning jobs and make coffee). By limiting the curricula to theoretical notions, even specifically sectoral, the risk is to limit the employability of learners because they will not necessarily be able to put into practice the knowledge obtained during their courses. It therefore appears necessary that greater practical training be implemented in order to make learners able to quickly take on the functions for which they are trained, and thus to improve their employability once they have completed their VET Level 4 programme.

- 3. Lack of knowledge updating and involvement of professional stakeholders.** Although the analysed curricula were found to address the basic knowledge of the transport and logistics sector, the countries' reports pointed out that the knowledge contained in the course materials is frequently outdated if compared to the current state of the art. The risk is that the learners have a basic knowledge in transport and logistics but that this knowledge is no longer in line with the realities on the ground. This lack of up-to-date knowledge may refer to theoretical knowledge, but also to the knowledge of methods and practices. The sector evolves very quickly and thus it appears necessary that students are provided with support and courses that are up-to-date, following the developments in the sector. Thus, the learners will be operational quickly after taking office.

A related phenomenon observed in all countries is the lack of instructors from the professional world. In fact, professionals coming from the fields of transport and logistics are confronted with sec-

toral changes in their daily lives, and are thus better able to familiarise students with new processes and sector specific methods. Being from the profession, they are also well suited to show the operational skills related to the exercise of professions, and thus are great assets in designing and executing role plays and concrete simulations that allow learners to put their knowledge into practice within the context of a professional situation.

4.2 Analysis of semi-structured interviews with experts from the logistics and transport industry

49 transport and logistics companies were interviewed by the four core partners of the SLS project in order to: (1) determine the level of competence of newcomers for the categories of employment to which the EQF Level 4 training courses in transport and logistics lead, and (2) highlight the knowledge, skills, and competences that merit further investigation. The gap between the current training offer and the identified needs of the transport and logistics industry provided the basis for the definition of the training objectives of the Summer Logistics School. The following sections highlight the knowledge, skills, and competences that, in the opinion of expert respondents from the transport and logistics sector, are mainly managed or, on the other hand, would need to be addressed by transport and logistics secondary schools.

*The skills and knowledge related to transport activities that **are mainly managed** by VET graduates from transport and logistics from the companies' point of view are:*

1. skills linked to transport organisation (VET students in transport and logistics have good knowledge in the organisation of transport missions),
2. skills linked to the knowledge of regulations (VET students correctly apply legal norms that regulate transport operations: driving and rest periods, minimum rest periods, existing exemptions and adjustments, national regulations, etc.), and
3. skills needed to adapt to new inputs (Adaptability is an essential skill for transport operators since their daily organisation of work is not fixed. They constantly review their planning in order to cope with the emerging hazards and to respond to last minute requests).

The *skills and knowledge related to logistics activities* that **are mainly managed** by VET graduates from transport and logistics from the companies' point of view are:

1. skills linked to global warehousing activities (The overall knowledge of logistics activities is mastered. This corresponds to the theoretical knowledge of the flows of goods and the related IT flows. Overall, newcomers are familiar with the different warehouse areas, which are receiving, order picking, and shipping. They know the traditional processes and methods found in each of these areas.),
2. basic IT skills (Newcomers to working positions in warehouses have at least a basic knowledge of computers: MS Office, such as Excel spreadsheets or Word, at least their basic functions.), and
3. internal communication (Newcomers into the world of logistics have been identified as able to engage in adequate internal communication. In fact, they usually know how to send information to their line managers, and to communicate with each other without too much difficulty.).

The *skills and knowledge related to transport activities* that **have to be deepened** by VET graduates from transport and logistics from the companies' point of view are:

1. drivers' management (Management is not a simple facet of the business, and is often approached from a legal and theoretical point of view in the training. Companies advocate real-life scenarios so that future operators can develop procedural knowledge. The ideal management attitude must lie in the middle ground between firmness and flexibility. It seems necessary to teach future workers the "win-win" culture that is neither too firm nor too lax.),
2. use of IT tools (The use of IT tools is now essential in the context of transport operations. At a minimum, traffic officers use Excel spreadsheets to plan activities, and in most companies the use of TMS is now widespread. Today, entrants to the position of transport operator have the basic knowledge and skills in computer science in general, while their knowledge of essential tools, such as TMS, is limited. Therefore, companies advocate that more practical learning of TMS has to be provided although upon arrival the operators are trained on the specificities of TMS used in the company.).

3. adaptability to new trends and processes (The skill of adaptability to new trends and processes also appeared to be lacking among newcomers in the business of transport operations. Transport operators should demonstrate adaptability to novelty. First, because they will be the first users of new tools and processes, as for example the eCMR, a new digital tool which should soon arrive in the sector and which should facilitate the administrative management of transport documents. Secondly, as facilitators of a team of truck drivers for which they will be responsible, the transport operators will be in charge of training the drivers in the use of new tools, and of the effective implementation of new tools in the daily lives of their team of employees.),
4. dealing with specificities (The interviews revealed that newcomers to the position of transport operator had basic knowledge in the techniques and regulations governing this field. However, they lack specific knowledge and skills (for instance, temperature-controlled transport, or transport of hazardous materials). These specificities have an impact not only on the organisation of the activity (specific training of drivers in the case of hazardous materials, use of specific trailers for controlled temperature) but also on the legal liability of the company if transport is not managed according to the rules of art.), and
5. different types of communication (To carry out their global mission of matching the means at their disposal to the transport demand of the customers, transport operators have to communicate with different actors. Their main contacts are the customers for the order-taking, the management of the after-sales service or in the case of hazards, but also the drivers for whom they are responsible. These two categories of interlocutors are very different and the relationship that a transport operator has with them is also significantly different. In the case of drivers this is a managerial relationship whereas in the case of customers of the company this is a business relationship. This difference results in a necessarily different way in which the operator communicates with these interlocutors. It is this differentiation of communication that has been flagged as weak for newcomers in the profession.).

The *skills and knowledge related to logistics activities* that **have to be deepened** by VET graduates from transport and logistics from the companies' point of view are:

1. putting theoretical knowledge into practice (Newcomers have a good knowledge of the world of logistics. However, their knowledge is usually too theoretical, and they have difficulties putting this knowledge into practice in their everyday work. If their knowledge is only or predominantly theoretical rather than realised through practical skills, the interest of companies will be limited, in-house training will be necessary and that will take time (and therefore cost money) from the company. As a result, it is essential to insist on practical aspects, by placing the users of the programme into professional situations through role plays, simulations, etc.),
2. order processing: goods supports and methods (There are large gaps concerning order picking in warehouses. Even though at the level of their training graduates have been familiarised with order preparation, concrete realisation is problematic. There are order preparation must-haves, which provide the bases that an order picker must apply to carry out their work according to the rules of art. In a very pragmatic way, the order picker must be able to choose the best support according to the volume of their order (pallet or parcel), but also know how to organise the different references of the order on the support so that they can be delivered in good condition (preparation from the largest to the smallest, from the heaviest to the lightest, etc.). The order picker must also be able to determine the best protection for the order: not too little, so that the objects are sufficiently protected, not too much, so that the packaging does not generate unnecessary cost to the company.),
3. inventory management (Inventories are vital to ensure the reliability of the stock, and to verify that certain dynamics are well respected. The need for training in inventory control is particularly high because of the computerisation of inventory management. Inventories are a means of verifying the concordance between theoretical stock (computer) and actual stock (physical). The interconnection between information systems also emphasises the importance of inventory control given that information can be traced directly to a company's commercial website. For example, if the reported information is wrong, the product indicated as available may not be in fact available, which may result in a disap-

pointed customer. Therefore, it seems necessary to concentrate on this specific point in order to guarantee that future workers in warehouses have a minimum knowledge in stock management.),

4. sectoral ICT tools (While basic computer skills are in general mastered and are also a prerequisite for any hiring, it appears that among newcomers the knowledge of software specific to the sector is quite poor and has to be the subject of company training. The main software used in logistics is WMS, which is a software tool for tracking physical activity in the warehouse at the computer level. This type of software allows the management of information on the location of stocks, quantities in stock, or on the location of a pallet within the warehouse, to mention just some options. Today, with the growing computerisation of warehouse management, it seems inevitable that professionals working in this field need to be comfortable with this type of tool.

Based on the gaps mentioned above, five TMs were prepared based on the premises of the ECVET system. They are presented in detail in the next chapter.

5. Training modules

This section presents LO Units related to the five qualifications of the TMs identified in the second activity of the SLS project. In addition to the competence standard, details of each TM content, and applied methodology, a main part of this section is detailed lesson plans. These provide information on the classroom realisation of each TM. By definition, "a lesson plan is a detailed step-by-step guide that outlines the trainer's objectives for what the students will accomplish during the course of the lesson and how they will learn it." (Cox, 2019). According to Kelly (2018), each "lesson plan includes the goal (what the students are supposed to learn), how the goal will be reached (the method, procedure) and a way of measuring how well the goal was reached (test, worksheet, homework etc.)."

The topics usually required in lesson plans regardless of the subject area are (Kelly, 2018; Cox, 2019):

- **title of lesson/description:** One sentence is usually enough, but a well-crafted title of a lesson plan explains a lesson well enough so that even a brief description is unnecessary.
- **lesson introduction/opening set:** This portion of the lesson should give a rationale how this introduction will help students make connections with the rest of the lesson or unit that is being taught. An opening set should be a planned activity that sets the tone for the lesson that follows.
- **objectives:** Two questions drive a lesson's objectives: (1) What is the reason or purpose for this lesson? What will students know or be able to do at the conclusion of this lesson? The objective(s) of a lesson define(s) the expectations for learning, and give(s) a hint on how learning will be assessed.
- **step-by-step procedure:** Trainers should write down the steps necessary to teach the lesson. This is a chance to think through each necessary action as a form of mental practice to better organise for the lesson. Trainers should also note down any materials they will need for each step.

- duration: Trainers should note the approximate time that each content will take to complete.
- materials required: Trainers should list any handouts and technology equipment that is required.

All five TMs, presented in the following sections, are structured in the same way. First, some general information (EQF level, training duration of the module, and pre-requisites needed to attend the module) is given, followed by a brief TM and methodology description. Then each LO Unit's knowledge and skills are described in detail together with up-to-date teaching material. After each TM description, the corresponding lesson plans can be found.

5.1 VET Level 4 in Transport and Logistics with specialisation in MARITIME AND INTERMODAL MANAGEMENT

EQF level: 4

Training duration: 12 hours

Pre-requisites: Students who attend secondary logistics and transport schools (EQF Level 4), fourth or fifth year. Teachers who teach at secondary logistics and transport schools. Employees from the transport and logistics industry.

5.1.1 Training module and methodology description

This TM focuses on two specific transport modes, maritime and intermodal transport. It consists of four LO Units:

- LO Unit 1: Assessing the main parameters for navigation.
- LO Unit 2: Recognising the main infrastructures and vehicles of maritime ports.
- LO Unit 3: Coordinating the arrival and departure of freight trains.
- LO Unit 4: Managing the storage of UTIs at the rail-road terminal.

While the maritime LO Units 1 and 2 focus on navigation and maritime logistics, the intermodal LO Units 3 and 4 focus on the management of an intermodal platform, and in particular on the management of a rail-road terminal, whether inland or located in a seaport.

LO Unit 1 presents the Electronic Chart Display and Information System (ECDIS), and the Automatic Radar Plotting Aid (ARPA) for safe conduct of navigation. This Unit takes place in a nautical simulator. The simulator consists of a real navigation bridge of a ship and a screen that displays the sea and the weather conditions. The navigation bridge moves according to the waves of the sea and allows the management of all parameters of the ship and navigation, and therefore steering of the ship. A radar is also present. In addition, this Unit includes the possibility of practising navigation on small vessels, thus understanding and using navigation techniques to assess weather parameters and conditions.

LO Unit 2, maritime logistics, focuses on various types and characteristics of vessels, different port terminals, cargo handling equipment, coordination of the arrival and departure of shipments, documentation related to shipments' arrival/departure, etc. The main teaching method will be the use of a case study. A visit to a port can also be organised.

With reference to the coordination of the arrival and departure of freight trains at an intermodal terminal or LO Unit 3, a simulator, developed within the Erasmus+ project SIMULTRA (Simulation of Logistics and Transport Processes), can be used. The simulator replicates the management of a rail-road inland terminal and enables the track selection for an incoming train, according to the train list, exchange of information with the rail company, coordination of loading and unloading activities performed by reach stacker drivers according to the layout, and checking in the trucks arriving at the terminal for delivering an outgoing transport unit or taking an incoming transport unit according to the booking request.

The main focus of the intermodal module is placed on the features of an intermodal terminal, the transport units, trains and wagons, documents, and the operational process of terminal management, including Key Performance Indicators (KPIs). Direct instruction will be used at the beginning of each LO Unit in order to prepare the participants for the use of the simulator, to help them understand the main characteristics of the layout of a terminal and the related documentation.

5.1.2 Learning outcome units

| | | |
|---|--|--|
| VET Level 4 in Transport and Logistics with specialisation in MARITIME and INTERMODAL MANAGEMENT | AUTONOMY/RESPONSIBILITY: he/she works in a team and relates with all the actors involved, owns soft skills, good communications skills, knows and uses the terminology in English. He/she understands the trends in modern navigation. He/she is autonomous in planning and organising the assigned tasks. | |
| | LO Unit 1: Assessing the main navigation parameters | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • the Electronic Chart Display and Information System (ECDIS), and the Automatic Radar Plotting Aid ARPA systems (E-navigation), • the purpose of all navigation systems interfaced with ECDIS, and • the purpose of the ARPA system. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • recognise the advantages of the Electronic Chart Display and Information System (ECDIS), and the Automatic Radar Plotting Aid (ARPA) for safe navigation, and • monitor information on ECDIS for safe navigation. |
| ASSESSMENT CRITERIA: Understanding progress in e-navigation. Understanding how ARPA provides a significant advance in collision avoidance navigation. | | |
| TEACHING MATERIALS: Heckt, H., Berking, B., Jonas, M. and Wöster, M. (2017). The Electronic Chart – Fundamentals, Functions, Data and other Essentials. A textbook for ECDIS Use and Training, 4th Edition. Lemmer: Geomares Publishing. Weintrit, A. (2009). The Electronic Chart Display and Information System (ECDIS): and Operational Handbook. London: Taylor & Francis Group. IMO (2011). IMO Model Course 1.27. Operational Use of ECDIS. London: IMO. | | |

| | | |
|--|---|---|
| VET Level 4 in Transport and Logistics with specialisation in MARITIME and INTERMODAL MANAGEMENT | AUTONOMY/RESPONSIBILITY: he/she works in a team and relates with all the actors involved, owns soft skills, knows and uses the terminology in English. He/she understands the trends in maritime logistics. He/she is autonomous in planning and organising the assigned tasks. He/she is accountable for the decisions made and actions taken. | |
| | LO Unit 2: Recognising the main infrastructures and vehicles of maritime ports | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • various types and characteristics of vessels, • various port terminals, • cargo handling equipment, • coordination of the arrival and departure of shipments, and • documentation related to the arrival and departure of shipments. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • select the right type of vessel and shipping company, • plan the arrival/departure of a ship from the viewpoint of a port agent and from the viewpoint of a forwarding agent, • complete documentation related to the arrival and departure of shipments, and • detect and resolve issues during the arrival and departure of shipments. |
| ASSESSMENT CRITERIA: Completing the necessary documentation at the arrival of a vessel. Completing the necessary documentation at the departure of a vessel. Organising the arrival and departure from the viewpoint of a port agent. Organising the arrival and departure from the viewpoint of a freight forwarder. Selecting the appropriate ship according to the type of shipment. | | |
| TEACHING MATERIALS: Song, D. W. and Panayides, P. (2015). Maritime Logistics: A Guide to Contemporary Shipping and Port Management. London: Kogan Page. Burns, M. G. (2014). Port Management and Operations. Boca Raton: CRC Press. | | |

| | | |
|---|---|---|
| VET Level 4 in Transport and Logistics with specialisation in MARITIME and INTERMODAL MANAGE- MENT | AUTONOMY/RESPONSIBILITY: he/she works in a team and relates with all the actors involved. He/she manages the documentation related to the terminal. He/she is autonomous in planning and organising the assigned tasks. | |
| | LO Unit 3: Coordinating the arrival and departure of freight trains | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • train and wagon characteristics (length, capacity, types, and codes/serial numbers), • rail-road terminal layout types, • documentation related to an intermodal terminal and transport (Rail/Train Plan, Train List, Stowage List, Truck Booking), and • KPIs for an inland terminal (MAD, HLR). | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • prepare a train list for a departing train considering the wagon's capacity, nett and gross weight, and rail line, • use the information from a train list of an incoming train, • check the truck's booking list and the truck information providing indications for the storage of the cargo, and • organise the activities taking into account the KPIs for the terminal. |
| ASSESSMENT CRITERIA: Knowing the features of trains, wagons, and transport units. Using documentation of an intermodal terminal. Recognising intermodal terminal layout types and KPIs. | | |
| TEACHING MATERIAL: Rodrigue, J.P. (2017). The Geography of Transport Systems. 4 th Edition. New York: Routledge. Monios, J. and Bergqvist, R. (2017). Intermodal Freight Transport and Logistics, 1st edition. Boca Raton: CRC Press. Kemme, N. (2012). Design and Operation of Automated Container Storage Systems. Berlin: Springer Science & Business Media. | | |

| VET Level 4 in Transport and Logistics with specialisation in MARITIME and INTERMODAL MANAGEMENT | AUTONOMY/RESPONSIBILITY: he/she works in a team and relates with all the actors involved. He/she manages the documentation related to the terminal. He/she is autonomous in planning and organising the assigned tasks. | |
|--|---|--------|
| | LO Unit 4: Managing the storage of transport units at the rail-road terminal | |
| | KNOWLEDGE | SKILLS |
| Once completed, the candidate will know: <ul style="list-style-type: none"> • types and characteristics of transport units, and • intermodal terminal equipment (reach stackers, gantry cranes) and operational characteristics. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • coordinate the unloading operations according to the stowing list, • organise the loading operations according to the booking list and truck arriving at the terminal, • provide instructions on the operations to be performed by the reach stackers or crane drivers/operators, and • organise the terminal layout according to transport units and necessary areas. | |
| ASSESSMENT CRITERIA: Using the documentation of an intermodal terminal. Knowing transport units. Coordinating loading and unloading operations. | | |
| TEACHING MATERIALS: Rodrigue, J.P. (2017). The Geography of Transport Systems. 4 th Edition. New York: Routledge. Monios, J. and Bergqvist, R. (2017). Intermodal Freight Transport and Logistics, 1st edition. Boca Raton: CRC Press. Kemme, N. (2012). Design and Operation of Automated Container Storage Systems. Berlin: Springer Science & Business Media. | | |

5.1.3 Lesson plans

| LO Unit 1: Assessing the main parameters for navigation | | | 4 hours |
|---|---|---|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 5 mins | <ul style="list-style-type: none"> Introduction (stating the objectives, presenting the lesson plan, briefly checking the participants' previous knowledge on the Electronic Chart Display and Information System (ECDIS) and the Automatic Radar Plotting Aid (ARPA)) | <ul style="list-style-type: none"> Discussion | Andrej Androjna |
| 40 mins | <ul style="list-style-type: none"> Introduction to the Automatic Radar Plotting Aid (ARPA) | <ul style="list-style-type: none"> ARPA simulator-based training | Andrej Androjna |
| 40 mins | <ul style="list-style-type: none"> Introduction to Electronic Chart Display and Information System (ECDIS) | <ul style="list-style-type: none"> ECDIS simulator-based training | Andrej Androjna |
| 90 mins | <ul style="list-style-type: none"> What is E-navigation? What is the purpose of all navigation systems interfaced with ECDIS? What are the advantages of ARPA and ECDIS? What does modern safe navigation imply? | <ul style="list-style-type: none"> Navigational simulator-based training | Andrej Androjna |
| 5 mins | <ul style="list-style-type: none"> Conclusion | <ul style="list-style-type: none"> Discussion | Andrej Androjna |
| MARINE/NAUTICAL SIMULATOR: Details on the marine/nautical simulator can be accessed from: http://en.fpp.uni-lj.si/mma_bin.php?id=2017080311315187 | | | |
| TEACHING MATERIALS: Heckt, H., Berking, B., Jonas, M. and Wöster, M. (2017). The Electronic Chart – Fundamentals, Functions, Data and other Essentials. A textbook for ECDIS Use and Training, 4th Edition. Lemmer: Geomares Publishing. | | | |

| LO Unit 2: Recognising the main infrastructures and vehicles of maritime ports | | | 2 hours |
|--|--|---|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 35 mins | <ul style="list-style-type: none"> • Port/terminal infrastructure • Types of vessels and their characteristics in accessing the port • Cargo handling equipment per port subsystem | <ul style="list-style-type: none"> • Direct instruction and case study of the Port of Koper | Bojan Beškovnik |
| 35 mins | <ul style="list-style-type: none"> • Basic documentation in maritime logistics • Coordination of a vessel's arrival in port • Releasing the cargo to the consignee and arranging inland transport | <ul style="list-style-type: none"> • Direct instruction and case study of processes related to the Port of Koper | Bojan Beškovnik |
| 20 mins | <ul style="list-style-type: none"> • Questions and answers on selected topics | <ul style="list-style-type: none"> • Discussion | Bojan Beškovnik |
| TEACHING MATERIALS: Song, D. W. and Panayides, P. (2015). Maritime Logistics: A Guide to Contemporary Shipping and Port Management. London: Kogan Page. | | | |

| LO Unit 3: Coordinating the arrival and departure of freight trains LO Unit 4: Managing the storage of UTIs at the rail-road terminal | | | 6 hours |
|--|--|---|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 30 mins | <ul style="list-style-type: none"> • Introduction • Expectations of the participants • Briefly checking the participants' previous knowledge | <ul style="list-style-type: none"> • Oral introduction • Mentimeter or Kahoot • Video material • Open discussion | Eleonora Tu |
| 135 mins | <ul style="list-style-type: none"> • Definition and terminology in the field of logistics: • Based on the pre-testing of knowledge, learners will be introduced to the fundamental concepts of the TM (what is logistics, what transport modes are available and their characteristics, intermodality, types of vehicles, standards) • Theory about arrival and departure of freight trains (trains and wagons characteristics, terminal types) • Theory about intermodal rail-road platforms (main layout, main operations) • Characteristics of UTIs • Documentation related to an Intermodal Terminal and related port operations • KPIs for an inland terminal • Introduction to the main players in the sector • Presentation of a relevant case study, some examples below: • DB Shenker (e.g., case study on clay and bulk materials) • Logistics nodes of Emilia-Romagna (e.g., Dinazzano or others – cereals and food) | <ul style="list-style-type: none"> • Traditional teaching/lecture • Slides • Open discussion • Case studies/ examples using audiovisual materials | Eleonora Tu |

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|--|---|---|-------------|
| 90 mins | <ul style="list-style-type: none"> • Presentation of the SIMULTRA Simulator for Intermodal Terminal Clerk – trainer • Use of the SIMULTRA Simulator under trainer supervision | <ul style="list-style-type: none"> • Introduction and use of supporting training material • Simulator use in a PC lab | Eleonora Tu |
| 45 mins | <ul style="list-style-type: none"> • Conclusion • Discussion | <ul style="list-style-type: none"> • Discussion | Eleonora Tu |
| <p>TEACHING TOOLS: SIMULTRA simulator on the main operational processes in the logistics and transport sector (ERASMUS+ project), outputs, and training material. The SIMULTRA simulators display innovative techniques and graphics and different levels of difficulty, which makes learning engaging and challenging, albeit highly professional: https://www.simultra-project.eu/ Mentimeter: Interactive presentation software: https://www.mentimeter.com/</p> | | | |
| <p>TEACHING MATERIALS: SIMULTRA (ERASMUS+ project) outputs and training material. Monios, J. and Bergqvist, R. (2017). Intermodal Freight Transport and Logistics, 1st edition. Boca Raton: CRC Press. Kemme, N. (2012). Design and Operation of Automated Container Storage Systems. Berlin: Springer Science & Business Media.</p> | | | |

5.2 VET Level 4 in Transport and Logistics with specialisation in SUPPLY CHAIN MANAGEMENT OF COLD PRODUCTS

EQF Level: 4

Training duration: 8 hours

Pre-requisites: Students who attend secondary logistics and transport schools (EQF Level 4), fourth or fifth year. Teachers who teach at secondary logistics and transport schools. Employees from the transport and logistics industry.

5.2.1 Training module and methodology description

This TM focuses on the supply chain management of a specific category of products, i.e., products that require a special temperature regime (such as pharmaceutical products, fresh food, etc.) or, in other words, cold products. It consists of four LO Units:

- LO Unit 1: Understanding the basics of supply chains.
- LO Unit 2: Organising a supply chain of cold products.
- LO Unit 3: Cold chain warehousing.
- LO Unit 4: Understanding the main aspects of transporting cold products.

LO Unit 1 describes some general aspects of supply chains (subjects, flows, types, risks, success factors). LO Unit 2 presents the main characteristics of a cold chain, the necessary cold chain infrastructure and equipment, and its maintenance. In LO Unit 3 special attention is placed on the storage of cold products, in particular:

- types and characteristics of warehouses for storing cold products, and
- technical requirements for cold products storage (definition of appropriate refrigeration conditions (e.g., temperature, humidity) at which goods have to be stored, standard operating procedures for the storage of cold products, procedures for appropriately stacking products, product handling processes, operating vapour detectors and alarms procedures, different types of storage equipment, requirements for the movement and distribution of cold products from the warehouse, and phases for updating

and confirming the temperature requirements of the loading bay and truck).

LO Unit 4 focuses on the main regulations and standards related to the transport of different cold products, main types and characteristics of cold chain technologies in providing a temperature-controlled environment during transport, main types of cold chain monitoring equipment, and safe transport of cold products.

The trainers provide basic knowledge on the cold supply chain using direct instruction, several board games, case studies, and simulations. To gain an insight into the dynamics and costs of a generic supply chain, the simulator developed within the SIMULTRA project (Erasmus+) can be used. The simulator is related to the organisation of a supply chain of a container that is shipped from a port in China and delivered to a European seaport. The simulator allows the assessment of all costs in the supply chain as well as the trends of such costs, and applies changes according to the needs of the import company. In addition, a relevant part of the training can be carried out by managers and experts of logistics service providers specialised in cold chain management. Moreover, in-company visits are included in this TM, to allow a deep understanding of the specificity of storage and transport activities within a cold supply chain.

5. 2. 2 Learning outcome units

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| VET Level 4 in Transport and Logistics with specialisation in SCM of COLD PRODUCTS | AUTONOMY/RESPONSIBILITY: he/she works in a team, uses computer knowledge, uses the correct terminology in the English language in order to communicate with clarity, understands and practises soft skills, plans and organises the assigned tasks. | |
| | LO Unit 1: Understanding the basics of supply chains | |
| | KNOWLEDGE | SKILLS |
| | <i>Once completed, the candidate will know:</i> <ul style="list-style-type: none"> • the difference between a supply chain and a logistics chain, • types of supply chains, • supply chain activities (procurement, production, distribution, reverse activities (recycling etc.)), • supply chain risks, and • the impact of ICT on supply chains. | <i>Once completed, the candidate will have the skill to:</i> <ul style="list-style-type: none"> • understand the difference between a supply chain and a logistics chain, • select the right type and supply chain strategy with respect to the type of product, • make a lean and/or agile supply chain, and • manage supply chain risks. |
| ASSESSMENT CRITERIA: Distinguishing logistics and supply chains. Selecting the appropriate supply chain strategy with respect to the type of product. Identifying and proactively managing supply chain risks. Selecting the appropriate ICT. Selecting the appropriate method to make the supply chain lean and/or agile. | | |
| TEACHING MATERIALS: Cristopher, M. (1998). Logistics and Supply Chain Management. London: Financial Times. Mentzer, J.T. (2001). Supply Chain Management. Thousand Oaks: Sage Publication. Dawei, L. (2011). Fundamentals of Supply Chain Management. Frederiksberg: Ventus Publishing Aps. | | |

| | | |
|---|---|---|
| VET Level 4 in Transport and Logistics with specialisation in SCM of COLD PRODUCTS | AUTONOMY/RESPONSIBILITY: he/she works in a team, uses computer knowledge, uses terminology in the English language in order to communicate with required clarity, understands and practises soft skills, communicates with supply chain partners with the required clarity, plans and safely performs the assigned tasks, detects and resolves issues during different logistics activities. | |
| | LO Unit 2: Organising a supply chain of cold products | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • the classification of cold products, • safety rules and procedures for different types of cold products, • health and security measures carried out during different logistics operations, • the precautions to be taken while handling cold products, • cold chain equipment and its maintenance, • temperature monitoring, recording, and adjusting, and • contingency plans for emergency situations. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • classify different types of cold products, their temperature, environmental requirements, and shelf lives, • follow the safety rules and procedures for different types of cold products, • maintain health and security measures carried out during different logistics operations, • select cold chain equipment for different cold products, • check and record temperature in the temperature record book, and • follow emergency steps. |
| ASSESSMENT CRITERIA: Selecting safety rules and procedures for different types of cold products. Maintaining health and security measures carried out during different logistics activities. Monitoring, recording, and adjusting temperature. Selecting appropriate equipment for different types of cold products. Establishing a sound maintenance system for cold chain equipment. | | |
| TEACHING MATERIALS: USAID DELIVER PROJECT, Task Order 1. (2011). The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities. Arlington: Va.: USAID DELIVER PROJECT, Task Order 1. | | |

| | | |
|---|---|---|
| VET Level 4 in Transport and Logistics with specialisation in SCM of COLD PRODUCTS | <p>AUTONOMY/RESPONSIBILITY: he/she works in a team, uses computer knowledge for electronic documentation, uses terminology in the English language in order to communicate with required clarity, understands and practices soft skills. He/she communicates with supply chain partners and colleagues with required clarity and in a professional manner, plans and performs assigned tasks, prioritises the schedule, detects and resolves issues during different logistics activities, develops good behaviour and leaves a positive image.</p> | |
| | <p>LO Unit 3: Cold chain warehousing</p> | |
| | <p>KNOWLEDGE</p> | <p>SKILLS</p> |
| | <p><i>Once completed, the candidate will know:</i></p> <ul style="list-style-type: none"> • the types and characteristics of warehouses for storing cold products, • storage pre-requisites and technical requirements for cold products movement and distribution, • standard operating procedures for the storage of cold products (1. Handling to minimise contamination., 2. Setting and checking the temperature on a regular basis., 3. Segregation and disposal of contaminated products., and 4. Operating vapour detectors and alarms.), • the procedure for maintaining cleanliness and hygiene of loading/unloading docks, and • different types of documentation as per product/industrial need. | <p><i>Once completed, the candidate will have the skill to:</i></p> <ul style="list-style-type: none"> • select the appropriate type of warehouse with respect to the requirements of the products, • store cold products according to their pre-requisites, technical requirements (temperature, humidity), and standard operating procedures, • set and maintain temperature, • check for product contamination, • operate vapour detectors and alarms, • follow the temperature conditions of the loading dock and truck, • follow hygienic and safety aspects of loading/unloading docks, and • complete different types of electronic documentation. |

ASSESSMENT CRITERIA:

Planning, organising and performing the storage of cold products according to their pre-requisites and technical requirements.

Carrying out movements from the rack to the loading bay and distribution of products according to their pre-requisites and technical requirements.

Maintaining safety, hygiene and temperature, humidity and refrigerated conditions at the warehouse.

TEACHING MATERIAL:

NPCS Board of Consultants & Engineers (2017). The Complete Book on Cold Storage, Cold Chain & Warehouse (with Controlled Atmosphere Storage & Rural Godowns). 2nd Edition. New Delhi: NIIR.

USAID | DELIVER PROJECT, Task Order 1. 2011. The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

| | | |
|---|---|---|
| VET Level 4 in Transport and Logistics with specialisation in SCM of COLD PRODUCTS | AUTONOMY/RESPONSIBILITY: he/she plans and organises the assigned tasks, prioritises the obtained schedule, detects and resolves issues during a transport activity, develops a good appearance and behaviour, communicates in a professional manner when dealing with customers and colleagues, uses computer knowledge for electronic documentation, uses terminology in English. | |
| | LO Unit 4: Understanding the main aspects of transporting cold products | |
| | KNOWLEDGE | SKILLS |
| | <i>Once completed, the candidate will know:</i> <ul style="list-style-type: none"> • the main regulations and standards related to a safe transport of different cold products before loading, during loading, transport, and unloading, • the major types and characteristics of cold chain technologies and vehicles in providing a temperature-controlled environment during transport, • the major types of cold chain monitoring equipment, • the importance of pre-trip checks on the vehicle (temperature, cleanliness), • the rules of a safe transport of cold products (uncovered areas on the floor plate of the truck, stability of cargo, no overstocking of cargo, bracing of cargo, etc.), and • different types of documentation as per product/ industrial need. | <i>Once completed, the candidate will have the skill to:</i> <ul style="list-style-type: none"> • follow appropriate requirements for the transport of different types of cold products, • deploy the appropriate packaging type for different cold products, • maintain the correct temperature in different types of cold chain technologies, • properly install, clean, and defrost cold chain technologies, and • check the status of cold chain monitoring equipment and temperature. |

ASSESSMENT CRITERIA:

Organising transport for different types of cold products (selecting the appropriate mode of transport, transport means, and packing type), ensuring proper bracing of cargo, ensuring the stability of loaded cargo, checking the vehicle and its temperature before loading, checking cargo temperature during the loading period.

Properly installing, cleaning, and defrosting cold chain technologies.

Completing different types of electronic documentation.

TEACHING MATERIAL:

USAID | DELIVER PROJECT, Task Order 1. 2011. The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health

Commodities. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

Luis R.G (2010). Development of Monitoring Systems for Cold Chain Logistics: Improving Food Safety through Emergent Sensing Technologies in the Cold Supply Chain. Saarbrücken: Lambert Academic Publishing.

5.2.3 Lesson plans

| LO Unit 1: Understanding the basics of supply chains | | | 2 hours |
|---|---|--|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 5 mins | <ul style="list-style-type: none"> • Introduction of the trainer and topics • Identification of the previous knowledge of the presented topics | <ul style="list-style-type: none"> • Kahoot | Patricija Bajec |
| 30 mins | <ul style="list-style-type: none"> • What is a supply chain? • Who are supply chain partners? • Which flows are present within a supply chain? • What are the aims of a supply chain? | <ul style="list-style-type: none"> • Real case study • Direct instruction | Patricija Bajec |
| 55 mins | <ul style="list-style-type: none"> • What is a logistics chain? • What are supply chain risks? | <ul style="list-style-type: none"> • Business on the move (board smart game) or role-playing game | Patricija Bajec |
| <p>TEACHING TOOLS: Kahoot! is a free game-based learning platform. When someone plays Kahoot! in a group setting, questions appear on a shared screen and players answer using their devices: https://kahoot.com/how-to-play-kahoot/ Business on the Move is an educational board game designed to familiarise players of all ages with business and global supply chains. It is unique in the way that sponsors feature in the game as themselves, making playing more realistic: www.businessonthemove.org</p> | | | |
| <p>TEACHING MATERIALS: Dawei, L. (2011). Fundamentals of Supply Chain Management. Frederiksberg: Ventus Publishing Aps.</p> | | | |

| LO Unit 2: Organising a supply chain for cold products | | | 2 hours |
|--|---|--|------------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 5 mins | <ul style="list-style-type: none"> Identifying the previous knowledge of the presented topics | <ul style="list-style-type: none"> Mentimeter | Riccardo Martini |
| 80 mins | <ul style="list-style-type: none"> Classification of cold products Safety rules and procedures for different types of cold products Health and security measures carried out during different logistics operations Precautions to be taken while handling cold products Cold chain equipment and its maintenance Temperature monitoring, recording, and adjusting | <ul style="list-style-type: none"> Case study Direct instruction | Riccardo Martini |
| 5 mins | <ul style="list-style-type: none"> Identifying the knowledge of the presented topics | <ul style="list-style-type: none"> Discussion | Riccardo Martini |
| <p>TEACHING TOOLS: Mentimeter. The app focuses on online collaboration for the education sector allowing students or public members to answer questions anonymously. The app enables users to share knowledge and provide real-time feedback on presentations, polls, or brainstorming sessions in classes, meetings, gatherings, conferences, and other group activities: https://www.mentimeter.com/</p> | | | |
| <p>TEACHING MATERIALS: NPCS Board of Consultants & Engineers (2017). The Complete Book on Cold Storage, Cold Chain & Warehouse (with Controlled Atmosphere Storage & Rural Godowns). 2nd Edition. New Delhi: NIIR.</p> | | | |

| LO Unit 3: Cold chain warehousing | | | 2 hours |
|---|--|--|------------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 5 mins | <ul style="list-style-type: none"> Identifying the previous knowledge of the presented topics | <ul style="list-style-type: none"> Mentimeter | Riccardo Martini |
| 80 mins | <ul style="list-style-type: none"> Types and characteristics of warehouses for storing cold products Storage pre-requisites and technical requirements for cold products movement and distribution Standard operating procedures for the storage of cold products Procedure for maintaining the cleanliness and hygiene of loading/unloading docks Different types of documentation | <ul style="list-style-type: none"> Case study Direct instruction | Riccardo Martini |
| 5 mins | <ul style="list-style-type: none"> Identifying the knowledge of the presented topics | <ul style="list-style-type: none"> Discussion | Riccardo Martini |
| TEACHING TOOLS: Mentimeter. The app focuses on online collaboration for the education sector allowing students or public members to answer questions anonymously. The app enables users to share knowledge and provide real-time feedback on presentations, polls, or brainstorming sessions in classes, meetings, gatherings, conferences, and other group activities: https://www.mentimeter.com/ | | | |
| TEACHING MATERIALS: NPCS Board of Consultants & Engineers (2017). The Complete Book on Cold Storage, Cold Chain & Warehouse (with Controlled Atmosphere Storage & Rural Godowns). 2 nd Edition. New Delhi: NIIR. | | | |

| LO Unit 4: Understanding the main aspects of transporting cold products | | | 2 hours |
|--|---|--|------------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 5 mins | <ul style="list-style-type: none"> Identifying the previous knowledge of the presented topics | <ul style="list-style-type: none"> Mentimeter | Riccardo Martini |
| 80 mins | <ul style="list-style-type: none"> Main regulations and standards related to the safe transport of different cold products before loading, during loading, transport, and unloading. Major types and characteristics of cold chain technologies and vehicles in providing a temperature-controlled environment during transport. Major types of cold chain monitoring equipment. Pre-trip checks on the vehicle (temperature, cleanliness). Safe transport of cold products (uncover areas on the floor plate of the truck, stability of cargo, no overstocking of cargo, bracing of cargo). Different types of documentation as per product/industrial need. | <ul style="list-style-type: none"> Case study Direct instruction | Riccardo Martini |
| 5 mins | <ul style="list-style-type: none"> Identifying the knowledge of the presented topics | <ul style="list-style-type: none"> Discussion | Riccardo Martini |
| <p>TEACHING TOOLS: Mentimeter. The app focuses on online collaboration for the education sector allowing students or public members to answer questions anonymously. The app enables users to share knowledge and provide real-time feedback on presentations, polls, or brainstorming sessions in classes, meetings, gatherings, conferences, and other group activities: https://www.mentimeter.com/</p> | | | |
| <p>TEACHING MATERIALS: NPCS Board of Consultants & Engineers (2017). The Complete Book on Cold Storage, Cold Chain & Warehouse (with Controlled Atmosphere Storage & Rural Godowns). 2nd Edition. New Delhi: NIIR.</p> | | | |

5.3 VET Level 4 in Transport and Logistics with specialisation in WAREHOUSE ANALYSIS

EQF Level: 4

Training duration: 8 hours

Pre-requisites: Students who attend secondary logistics and transport schools (EQF Level 4), fourth or fifth year. Teachers who teach at secondary logistics and transport schools. Employees from the transport and logistics industry.

5.3.1 Training module and methodology description

This TM will cover three main topics:

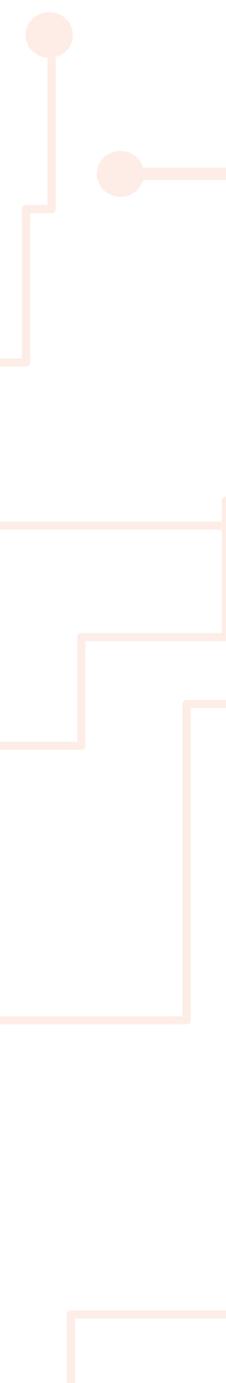
1. warehouse activities with a focus on order processing (acceptance of the order by the picker, making picking units using different technologies, checking and dispatching the order),
2. system for efficient warehouse management (WMS), and
3. methods for the optimal management of a warehouse, in particular the data needed for running an analysis and assessment of the basic warehouse KPIs, and methods for collecting and elaborating data using basic statistical tools.

This TM consists of four LOs:

- LO Unit 1: Calculating and assessing the KPIs of a logistics warehouse.
- LO Unit 2: Proper use of a Warehouse Management System.
- LO Unit 3: Preparing an order.
- LO Unit 4: Using methods/techniques for the optimisation of warehouse operations.

LO Unit 1 is focused on the calculation and assessment of basic warehouse KPIs. LO Unit 2 presents the proper use of WMS. Warehouse activities are presented in the third unit and optimisation of warehouse operations in the fourth.

In terms of the applied methodology, direct instruction is used to present warehouse processes (arrival of units into a warehouse, identification of units, assigning storage locations, the put-away process,



replenishment, picking, and dispatch) and equipment, including its operation and use. Case studies, video presentations, and WMS can be used in this TM. WMS can be used in order to fill in data and information of incoming products, to check the inventory, to prepare an order list, etc. WMS can be linked to real-life tools, such as bar code readers and label printers, if available. In this case it would be possible to fully simulate the reception of goods and order processing. Warehouse analysis can be carried out using real data and Microsoft Excel. The calculation of the basic KPIs (ABC analysis, etc.) can be presented to and done by the participants. A visit to a warehouse for fresh products can be organised to show the application of the presented theory in practice.

5.3.2 Learning outcome units

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| VET Level 4 in Transport and Logistics with specialisation in WAREHOUSE ANALYSIS | AUTONOMY/RESPONSIBILITY: he/she autonomously organises the assigned tasks, and communicates in a professional manner when dealing with customers and colleagues, also using English terminology. He/she proposes improvements to warehouse processes based on calculated KPI values. He/she oversees warehouse processes. | |
| | LO Unit 1: Calculating and assessing the KPIs of a logistics warehouse | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • kinds and sources of data needed for warehouse performance analysis, • basic KPIs in a warehouse and their importance according to value, and • methods for the calculation of different KPIs in a warehouse. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • calculate the proper value of basic warehouse KPIs, • explain the value of KPIs and their influence on warehouse processes, • use different methods for the calculation of KPIs, and • apply actions according to KPI results. |
| ASSESSMENT CRITERIA Understanding the importance of basic KPIs for a warehouse. Understanding input data. Using methods for calculating basic KPIs. | | |
| TEACHING MATERIAL: Staudt F.H., Di Mascolo M., Alpan G. and Rodriguez C.M.T. (2015). Warehouse Performance Measurement: Classification and Mathematical Expressions of Indicators. Grenoble: University of Grenoble Alpes France; Santa Catarina: Federal University of Santa Catarina. Novo Trigo, A.P. (2015). Development of KPIs for Assessing the Internal Logistics of UNIVEG's Warehouse, Department of Engineering and Management. Lisbon: Instituto Superior Tecnico. Johnson A.L. and McGinnis L.F. (2011). Performance Measurement in the Warehousing Industry. <i>IIE Transactions</i> 43(3), 220-230. | | |

| | | |
|---|---|---|
| VET Level 4 in Transport and Logistics with specialisation in WAREHOUSE ANALYSIS | AUTONOMY/RESPONSIBILITY: he/she autonomously organises the assigned tasks, and communicates in a professional manner when dealing with customers and colleagues, also using English terminology. He/she proposes improvements to warehouse processes based on calculated KPI values. He/she oversees warehouse processes. | |
| | LO Unit 2: Proper use of a Warehouse Management System (WMS) | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • basic warehouse processes, • basic WMS architecture, • the connection between WMS features and warehouse processes and activities, • WMS features in warehouse processes, and • tools for data entry into WMS, such as a bar code reader and bar code scanner. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • use WMS in warehouse processes, • understand basic WMS features, • use a bar code scanner, • use a bar code reader, • enter proper data in WMS, and • recognise the WMS interface. |
| ASSESSMENT CRITERIA Using the basic functions of WMS. Using bar code readers and scanners. Understanding the main features and functions of WMS. | | |
| TEACHING MATERIAL: Bartholdi J.J. and Hackman, T.S. (2017). Warehouse & Distribution Science. Atlanta: The Supply Chain & Logistics Institute. Richards, G. (2017). Warehouse Management: a Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse. London: Kogan Page. Riegler, T., Bartas, G. and Steiner, R. (2017). WMS Warehouse Management System Basics: Microsoft Dynamics 365 for Operations. Scotts Valley: CreateSpace Publishing. | | |

| | | |
|---|---|---|
| VET Level 4 in Transport and Logistics with specialisation in WAREHOUSE ANALYSIS | AUTONOMY/RESPONSIBILITY: he/she autonomously organises the assigned tasks, and communicates in a professional manner when dealing with customers and colleagues, also using English terminology. He/she proposes improvements to warehouse processes based on calculated KPI values. He/she oversees warehouse processes. | |
| | LO Unit 3: Preparing an order | |
| | KNOWLEDGE | SKILLS |
| | <i>Once completed, the candidate will know:</i> <ul style="list-style-type: none"> • warehouse documents, • different warehouse procedures, and • procedures for completing warehouse documents. | <i>Once completed, the candidate will have the skill to:</i> <ul style="list-style-type: none"> • use warehouse documents, • produce dispatch documentation, • record and store documents, and • follow up purchase orders. |
| ASSESSMENT CRITERIA Knowing the main warehouse documents. Filling in the main warehouse documents. Understanding the departments/actors to whom to send the documents. | | |
| TEACHING MATERIAL: Bartholdi J.J. and Hackman, T.S. (2017). Warehouse & Distribution Science. Atlanta: The Supply Chain & Logistics Institute. Richards, G. (2017). Warehouse Management: a Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse. London: Kogan Page. | | |

| VET Level 4 in Transport and Logistics with specialisation in WAREHOUSE ANALYSIS | AUTONOMY/RESPONSIBILITY: he/she autonomously organises the assigned tasks, communicates in a professional manner when dealing with customers and colleagues, also using English terminology. He/she proposes improvements to warehouse processes based on calculated KPI values. He/she oversees warehouse processes. | |
|---|---|--------|
| | LO Unit 4: Using methods/techniques for the optimisation of warehouse operations | |
| | KNOWLEDGE | SKILLS |
| Once completed, the candidate will know: <ul style="list-style-type: none"> • the effective layout for each warehouse type, • efficient warehouse systems for different kinds of goods, and • available storage space within a warehouse. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • move and handle goods and materials, • evaluate warehouse processes with efficiency and quality, and • store goods efficiently within a warehouse. | |
| ASSESSMENT CRITERIA Knowing warehouse layout types. Applying warehouse types to specific kinds of goods. Carrying out a stock control. | | |
| TEACHING MATERIAL: Bartholdi J.J. and Hackman, T.S. (2017). Warehouse & Distribution Science. Atlanta: The Supply Chain & Logistics Institute. Richards, G. (2017). Warehouse Management: a Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse. London: Kogan Page. | | |

5.3.3 Lesson plans

| LO Unit 1: Calculating and assessing the KPIs of a logistics warehouse | | | 2 hours |
|--|--|--|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 20 mins | <ul style="list-style-type: none"> Warehouse performance analysis | <ul style="list-style-type: none"> Theory presentation (direct instruction) | Kristijan Rogić |
| 25 mins | <ul style="list-style-type: none"> Basic KPIs in a warehouse and their meaning according to value | <ul style="list-style-type: none"> KPI mathematical calculation presentation | Kristijan Rogić |
| 45 mins | <ul style="list-style-type: none"> Calculation method of different KPIs in a warehouse | <ul style="list-style-type: none"> Case study – logistics company (Croatian market) | Kristijan Rogić |
| <p>TEACHING MATERIALS: Staudt F.H., Di Mascolo M., Alpan G. and Rodriguez, C.M.T. (2015). Warehouse Performance Measurement: Classification and Mathematical Expressions of Indicators. Grenoble: University of Grenoble Alpes France; Santa Catarina: Federal University of Santa Catarina. Novo Trigo, A.P. (2015). Development of KPIs for Assessing the Internal Logistics of UNIVEG's Warehouse, Department of Engineering and Management. Lisbon: Instituto Superior Tecnico.</p> | | | |

| LO Unit 2: Proper use of a Warehouse Management System (WMS) | | | 2 hours |
|---|--|--|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 20 mins | <ul style="list-style-type: none"> Understand basic warehouse processes | <ul style="list-style-type: none"> Theory presentation (direct instruction) | Kristijan Rogić |
| 20 mins | <ul style="list-style-type: none"> Basic WMS architecture | <ul style="list-style-type: none"> Theory presentation (direct instruction) | Kristijan Rogić |
| 20 mins | <ul style="list-style-type: none"> Connection between WMS features and warehouse processes and activities | <ul style="list-style-type: none"> Theory presentation (direct instruction) | Kristijan Rogić |
| 20 mins | <ul style="list-style-type: none"> WMS features in warehouse processes | <ul style="list-style-type: none"> Case study – logistics company (Croatian market) | Kristijan Rogić |
| 10 mins | <ul style="list-style-type: none"> WMS data input | <ul style="list-style-type: none"> Case study – logistics company (Croatian market) | Kristijan Rogić |
| <p>TEACHING MATERIALS: Richards, G. (2017). Warehouse Management: a Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse. London: Kogan Page. Riegler, T., Bartas, G. and Steiner, R. (2017). WMS Warehouse Management System Basics: Microsoft Dynamics 365 for Operations. Scotts Valley: CreateSpace Publishing.</p> | | | |

| LO Unit 3: Preparing an order | | | <i>2 hours</i> |
|--|---|--|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 45 mins | <ul style="list-style-type: none"> Understanding warehouse documentation | <ul style="list-style-type: none"> Theory presentation | Ivona Bajor |
| 30 mins | <ul style="list-style-type: none"> Use of warehouse documentation | <ul style="list-style-type: none"> Theory presentation | Ivona Bajor |
| 10 mins | <ul style="list-style-type: none"> Warehouse procedures | <ul style="list-style-type: none"> Theory presentation | Ivona Bajor |
| 5 mins | <ul style="list-style-type: none"> Procedures for completing warehouse documentation | <ul style="list-style-type: none"> Case study – logistics company (Croatian market) | Ivona Bajor |
| TEACHING MATERIALS: Richards, G. (2017). Warehouse Management: a Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse. London: Kogan Page. | | | |

| LO Unit 4: Using methods/techniques for the optimisation of warehouse operations | | | <i>2 hours</i> |
|--|---|---|-----------------|
| Time needed | Detailed content | Methodology | Name of trainer |
| 45 mins | <ul style="list-style-type: none"> Effective layout for a certain type of warehouse | <ul style="list-style-type: none"> Theory presentation Drawing layout types | Ivona Bajor |
| 30 mins | <ul style="list-style-type: none"> Efficient warehouse systems for a certain type of goods | <ul style="list-style-type: none"> Theory presentation Case study – logistics company (Croatian market) | Ivona Bajor |
| 15 mins | <ul style="list-style-type: none"> Available storage space within a warehouse | <ul style="list-style-type: none"> Case study – logistics company (Croatian market) | Ivona Bajor |
| TEACHING MATERIALS: Richards, G. (2017). Warehouse Management: a Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse. London: Kogan Page. | | | |

5. 4 VET Level 4 in Transport and Logistics with specialisation in TRANSPORT ORGANISATION

EQF Level: 4

Training duration: 12 hours

Pre-requisites: Students who attend secondary logistics and transport schools (EQF Level 4), fourth or fifth year. Teachers who teach at secondary logistics and transport schools. Employees from the transport and logistics industry.

5.4.1 Training module and methodology description

This TM addresses the organisation of a transport mission by road and, therefore, focuses on all the details that are involved in the preparation of a road transport mission, such as:

selecting the appropriate type of vehicle concerning the volume, weight, and delivery time,

1. selecting the appropriate type of unit,
2. planning the optimal route,
3. monitoring the transport mission,
4. filling in the transport document (CRM), and
5. calculating the costs.

TM4 consists of 5 LO Units:

- LO Unit 1: Calculating the costs of a transport mission.
- LO Unit 2: Preparing a transport mission.
- LO Unit 3: Assessing the feasibility of a transport mission.
- LO Unit 4: Monitoring a transport mission.
- LO Unit 5: Assessing the KPIs of a transport mission.

The first part of TM4 can be presented by direct instruction in order to refresh the participants' knowledge and provide the necessary information that will enable them to understand real-life case studies and carry out practical tasks and applications. Case studies and tasks

based on authentic parameters (problem solving) can be carried out in order to fill out transport documents, select the right transport mode and vehicle for a transport mission, select the appropriate type of unit, assess the right cost of the transport mission, and monitor it. In order to discuss authentic and real workplace situations, case studies can be realised through a direct involvement of transport companies and transport managers.

In this TM, TMS or other simulators for the management and monitoring of a transport mission can be used. Both tools allow the replication of the main tasks carried out by a clerk of a transport office. Therefore, based on the service requests from a customer, the user plans and organises the transport mission, taking into account the fleet's vehicles as well as the driving hours of the drivers.

5.4.2 Learning outcome units

| | | |
|---|---|---|
| VET Level 4 in Transport and Logistics with specialisation in TRANSPORT ORGANISATION | AUTONOMY/RESPONSIBILITY: he/she works autonomously on assessing and preparing a transport mission. He/she interacts internally when needed (for example, regarding price negotiations) and externally in a proper way and depending on the interlocutor. | |
| | LO Unit 1: Calculating the costs of a transport mission | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • the main components of a transport mission, • the costs to be included in the calculation, • company margin politics, and • the road transport tariff system. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • calculate the costs of a transport mission, • apply a company's price policy, and • interact with customers regarding transport prices. |
| ASSESSMENT CRITERIA Calculating the transport costs for a mission. Reading and understanding a company's price policy. Knowing different kinds of costs and their origins. | | |
| TEACHING MATERIAL: Pidgeon, C. (2016). A Study Guide for the Operator Certificate of Professional Competence (CPC) in Road Freight 2018: A Complete Self-Study Course for OCR and CILT Examinations. London: Kogan Page. Lowe, D. and Pidgeon, C. (2018). Lowe's Transport Manager's & Operator's Handbook. London: Kogan Page. | | |

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| VET Level 4 in Transport and Logistics with specialisation in TRANSPORT ORGANISATION | AUTONOMY/RESPONSIBILITY: he/she works autonomously on assessing and preparing a transport mission. He/she interacts internally when needed (for example, regarding price negotiations) and externally in a proper way and depending on the interlocutor. | |
| | LO Unit 2: Preparing a transport mission | |
| | KNOWLEDGE | SKILLS |
| | <i>Once completed, the candidate will know:</i> <ul style="list-style-type: none"> • the compulsory documents for road transport, • how and what to communicate with internal actors regarding a transport mission, and • contract details and features (importance, objectives). | <i>Once completed, the candidate will have the skill to:</i> <ul style="list-style-type: none"> • prepare all necessary documents for a transport mission, and • communicate with internal and external internal actors. |
| ASSESSMENT CRITERIA Knowing different transport documents. Knowing the main document features. Filling in transport documents. | | |
| TEACHING MATERIAL: Pidgeon, C. (2016). A Study Guide for the Operator Certificate of Professional Competence (CPC) in Road Freight 2018: A Complete Self-Study Course for OCR and CILT Examinations. London: Kogan Page. Lowe, D. and Pidgeon, C. (2018). Lowe's Transport Manager's & Operator's Handbook. London: Kogan Page. | | |

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|---|--|---|
| VET Level 4 in Transport and Logistics with specialisation in TRANSPORT ORGANISATION | AUTONOMY/RESPONSIBILITY: he/she works autonomously on assessing and preparing a transport mission. He/she interacts internally when needed (for example, regarding price negotiations) and externally in a proper way and depending on the interlocutor. | |
| | LO Unit 3: Assessing the feasibility of a transport mission | |
| | KNOWLEDGE | SKILLS |
| | <i>Once completed, the candidate will know:</i> <ul style="list-style-type: none"> • transport means, • the schedule for each transport means, and • rules linked to transport organisation. | <i>Once completed, the candidate will have the skill to:</i> <ul style="list-style-type: none"> • determine if the company can accept a mission, • establish a schedule for each transport means, and • re-organise the established schedules to have the means to accept a mission. |
| ASSESSMENT CRITERIA Complying with regulations. Assessing the potential of the found solution. | | |
| TEACHING MATERIAL: Pidgeon, C. (2016). A Study Guide for the Operator Certificate of Professional Competence (CPC) in Road Freight 2018: A Complete Self-Study Course for OCR and CILT Examinations. London: Kogan Page. Lowe, D. and Pidgeon, C. (2018). Lowe's Transport Manager's & Operator's Handbook. London: Kogan Page. | | |

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|---|--|---|
| VET Level 4 in Transport and Logistics with specialisation in TRANSPORT ORGANISATION | AUTONOMY/RESPONSIBILITY: he/she works autonomously on assessing and preparing a transport mission. He/she interacts internally when needed (for example, regarding price negotiations) and externally in a proper way and depending on the interlocutor, also in order to find solutions to criticalities and other matters. | |
| | LO Unit 4: Monitoring a transport mission | |
| | KNOWLEDGE | SKILLS |
| | <i>Once completed, the candidate will know:</i> <ul style="list-style-type: none"> • the equipment and tools to monitor transport means (TMS, phone, etc.), and • approaches to risk management. | <i>Once completed, the candidate will have the skill to:</i> <ul style="list-style-type: none"> • follow transport operations, • interact with mission actors (customer, driver, customs), and • find solutions in case of risks/problems. |
| ASSESSMENT CRITERIA Understanding the quality of found solutions. Practising quality communications. | | |
| TEACHING MATERIAL: Pidgeon, C. (2016). A Study Guide for the Operator Certificate of Professional Competence (CPC) in Road Freight 2018: A Complete Self-Study Course for OCR and CILT Examinations. London: Kogan Page. Lowe, D. and Pidgeon, C. (2018). Lowe's Transport Manager's & Operator's Handbook. London: Kogan Page. | | |

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|---|--|--|
| VET Level 4 in Transport and Logistics with specialisation in TRANSPORT ORGANISATION | AUTONOMY/RESPONSIBILITY: he/she works autonomously on assessing and preparing a transport mission. He/she interacts internally when needed (for example, regarding price negotiations) and externally in a proper way and depending on the interlocutor, also in order to find solutions to criticalities and other matters. | |
| | LO Unit 5: Assessing the KPIs of a transport mission | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • the main KPIs of a transport mission. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • understand the scope of KPIs in a transport mission, and • analyse KPIs and find solutions to improve activities. |
| ASSESSMENT CRITERIA Understanding KPIs. Improving operations based on KPI analysis. | | |
| TEACHING MATERIAL: Pidgeon, C. (2016). A Study Guide for the Operator Certificate of Professional Competence (CPC) in Road Freight 2018: A Complete Self-Study Course for OCR and CILT Examinations. London: Kogan Page. Lowe, D. and Pidgeon, C. (2018). Lowe's Transport Manager's & Operator's Handbook. London: Kogan Page. | | |

5.4.3 Lesson plans

| Unit 1 of TM4: Methodology in the treatment of a transport demand | | | 2.5 hours |
|---|--|---|--|
| LO Unit 1: Calculating the costs of a transport mission LO Unit 2: Assessing the feasibility of a transport mission LO Unit 3: Preparing a transport mission LO Unit 4: Monitoring a transport mission LO Unit 5: Assessing the KPIs of a transport mission | | | |
| Time needed | Detailed content | Methodology | Name of trainer |
| 30 mins | <ul style="list-style-type: none"> Welcome Energiser Introduction to the working day (LO Units 1 and 2) Eliciting expectations from the participants | <ul style="list-style-type: none"> Oral introduction Open discussion Possible use of Slido: interactive online tool to visualise expectations and needs | Sarah Koneke (in cooperation with Patricija Bajec) |
| 40 mins | <ul style="list-style-type: none"> Analysis of customer demand <p>Learners will need to think about the elements they need to know to analyse customer demand. They should ask questions, such as: Who - What - Where - When - How? and outline which elements they need to take into consideration (e.g., What? elements to be taken into account: type of goods; particularities: dangerous, perishable, liquid, requiring authorisations; value; packing and packaging; size of the shipment: weight and volume)</p> | <ul style="list-style-type: none"> 20 mins of practical task: discussions in small groups of 3 or 4 learners 20 mins of presentation: each group presents its results, the trainer completes and presents all correct answers (PowerPoint presentation) | Sarah Koneke (in cooperation with Patricija Bajec) |

| | | | |
|--|--|---|--|
| 40 mins | <ul style="list-style-type: none"> • Feasibility study • Same principles as above: the participants will need to think about the elements that they need to decide upon if the transport mission is feasible (KPIs, available resources, negotiations and planning of means, formalisation of the offer to the customer) | <ul style="list-style-type: none"> • 20 mins of practical task: discussions in small groups of 3 or 4 learners • 20 mins of presentation: each group presents its results, the trainer completes and presents all correct answers (PowerPoint presentation) | Sarah Koneke (in cooperation with Patricija Bajec) |
| 40 mins | <ul style="list-style-type: none"> • Implementation of the transport mission • Same principles as above: the participants will need to think about what they need to do to carry out the transport mission (instructions to be given, follow up, documents to be obtained, documents to be given, etc.) | <ul style="list-style-type: none"> • 20 mins of practical task: discussions in small groups of 3 or 4 learners • 20 mins presentation: each group presents its results, the trainer completes and presents all correct answers (PowerPoint presentation) | Sarah Koneke (in cooperation with Patricija Bajec) |
| TEACHING TOOLS: PowerPoint presentation summing up the main points of different topics. | | | |
| TEACHING MATERIALS: Document "SLS_IO2_Training Professional Reflexes.docx" prepared by AFT for the SLS project. Lowe, D. and Pidgeon, C. (2018). Lowe's Transport Manager's & Operator's Handbook. London: Kogan Page. Pidgeon, C. (2016). A Study Guide for the Operator Certificate of Professional Competence (CPC) in Road Freight 2018: A Complete Self-Study Course for OCR and CILT Examinations. London: Kogan Page. | | | |

| Unit 2 of TM4: Use of a case study | | | 5 hours |
|---|---|---|--|
| LO Unit 1: Calculating the costs of a transport mission LO Unit 2: Assessing the feasibility of a transport mission LO Unit 3: Preparing a transport mission LO Unit 4: Monitoring a transport mission LO Unit 5: Assessing the KPIs of a transport mission | | | |
| Time needed | Detailed content | Methodology | Name of trainer |
| 5 mins | <ul style="list-style-type: none"> • Energiser | <ul style="list-style-type: none"> • Energiser | Sarah Koneke |
| 10 mins | <ul style="list-style-type: none"> • Introduction to the case study | <ul style="list-style-type: none"> • Oral introduction | Sarah Koneke (in cooperation with Patricija Bajec) |
| 45 mins | <ul style="list-style-type: none"> • Reflections to have and questions to ask yourself while reading transport documents | <ul style="list-style-type: none"> • 25 mins of practical task: discussions in small groups of 3 or 4 learners • 20 mins of presentation: each group presents its results, the trainer completes and presents all correct answers (PowerPoint presentation) | Sarah Koneke (in cooperation with Patricija Bajec) |
| 60 mins | <ul style="list-style-type: none"> • Questions on the case study | <ul style="list-style-type: none"> • 45 mins of practical task: discussions in small groups of 3 or 4 learners • 15 mins of presentation: each group presents its results, the trainer completes and presents all correct answers (PowerPoint presentation) | Sarah Koneke (in cooperation with Patricija Bajec) |

| | | | |
|---|--|---|--|
| 60 mins | <ul style="list-style-type: none"> • Filling out a CMR (Bill of Lading) | <ul style="list-style-type: none"> • We will give them a copy of a CMR, information about the carrier and an invoice. Based on this, they will complete the CMR. | Patricija Bajec |
| 30 mins | <ul style="list-style-type: none"> • Post-testing of knowledge | <ul style="list-style-type: none"> • Interactive methodology of evaluation • Discussion | Sarah Koneke (in cooperation with Patricija Bajec) |
| TEACHING TOOLS: PowerPoint presentation summing up the solutions to the different tasks and questions. | | | |
| TEACHING MATERIALS: Document "SLS_IO2_TM4_Transport Organisation.docx" prepared by AFT for the SLS project. Case study "Nidotrans". CMR prepared by FPP. Pidgeon, C. (2016). A Study Guide for the Operator Certificate of Professional Competence (CPC) in Road Freight 2018: A Complete Self-Study Course for OCR and CILT Examinations. London: Kogan Page. Lowe, D. and Pidgeon, C. (2018). Lowe's Transport Manager's & Operator's Handbook. London: Kogan Page. | | | |

| Unit 3 of TM4: Simulator use to consolidate the knowledge and skills of LO Units 1 and 2 | | | 3.5 hours |
|--|--|--|-----------------|
| LO Unit 1: Calculating the costs of a transport mission LO Unit 2: Assessing the feasibility of a transport mission LO Unit 3: Preparing a transport mission LO Unit 4: Monitoring a transport mission LO Unit 5: Assessing the KPIs of a transport mission | | | |
| Time needed | Detailed content | Methodology | Name of trainer |
| 20 mins | <ul style="list-style-type: none"> Welcome Energiser Introduction and setting up for the use of the simulator | <ul style="list-style-type: none"> Energiser Oral introduction | Sarah Koneke |
| 80 mins | <ul style="list-style-type: none"> Presentation of the SIMULTRA simulator for transport clerks Use of the SIMULTRA simulator | <ul style="list-style-type: none"> Oral introduction and presentation of supporting training material (text or PPT file) Simulator (used by the teachers and students) in a PC lab | Sarah Koneke |
| 80 mins | <ul style="list-style-type: none"> Presentation of the SIMULTRA simulator for customs clerks Use of the SIMULTRA simulator | <ul style="list-style-type: none"> Oral introduction and supporting training material (text or PPT file) Simulator (used by the teachers and students) in a PC lab | Sarah Koneke |
| TEACHING TOOLS: SIMULTRA simulator on the main operational processes in the logistics and transport sector (ERASMUS+ project) outputs and training material. The SIMULTRA simulators display innovative techniques and graphics and different levels of difficulty, which make learning engaging and challenging, albeit highly professional: https://www.simultra-project.eu/ | | | |
| TEACHING MATERIALS: SIMULTRA (ERASMUS+ project) outputs and training material. | | | |

5.5 VET Level 4 in Transport and Logistics with specialisation in KEY SOFT SKILLS

EQF Level: 4

Training duration: 8 hours

Pre-requisites: Students who attend secondary logistics and transport schools (EQF Level 4), fourth or fifth year. Teachers who teach at secondary logistics and transport schools. Employees from the transport and logistics industry.

5.5.1 Training module and methodology description

This TM focuses on two transversal topics that are common to all sectors, all countries, and all categories of workers and learners: stress resilience and change management.

TM 5 consists of three LOs:

- LO Unit 1: Managing stress.
- LO Unit 2: Time management and prioritising.
- LO Unit 3: Managing changes.

The logistics sector is under constant pressure to provide logistics services as soon as possible in order to enable an agile supply chain. Moreover, some logistics activities (transport, inventory) are usually featured by seasonal trends, with peak periods in which working times and activities are greater than in other periods, or different if compared to other sectors. Working in such a work environment can be very stressful. This TM, therefore, firstly focuses on the reasons and consequences of stress. These are presented through direct instruction. On the other hand, different techniques for stress prevention and coping mechanisms are tested by the participants using role-playing games.

Considering all the changes brought by globalisation, increased use of different technologies, working methods, etc., change management is an important skill that needs to be learned. The development of the understanding of the response to change and change management is therefore the second part of this TM. Change management is closely linked to the concept of flexibility, which is why creative thinking and the ability to re-invent ourselves are also presented at the end of TM 5.

5.5.2 Learning outcome units

| | | |
|---|--|--|
| VET Level 4 in Transport and Logistics with specialisation in KEY SOFT SKILLS IN TRANSPORT AND LOGISTICS | AUTONOMY/RESPONSIBILITY: he/she works in a team, relates to and communicates with different actors understanding the interlocutor's skills, needs, and social features. | |
| | LO Unit 1: Managing changes and stress | |
| | KNOWLEDGE | SKILLS |
| | Once completed, the candidate will know: <ul style="list-style-type: none"> • the reasons and consequences of stress, • different techniques for stress prevention and coping mechanisms, • time management and prioritising, • the concept of mobility and flexibility, • how humans react to change, and • personal development and continuous training. | Once completed, the candidate will have the skill to: <ul style="list-style-type: none"> • recognise stress and various stressors, • develop and implement stress prevention techniques and effective mechanisms for managing stress, • recognise priorities and develop a time management strategy, • develop an understanding of the response to change and change management, and • recognise the need for personal development/training, and prepare a personal development plan. |
| ASSESSMENT CRITERIA Understanding key concepts (stress, coping mechanisms, time management, prioritising, change management). Applying different effective mechanisms for managing stress. Understanding the importance of prioritising and time management. Understanding reactions to change and the process of change acceptance. | | |
| TEACHING MATERIALS: Landy, F.J. and Conte, J.M. (2013). <i>Work in the 21st Century: An Introduction to Industrial and Organisational Psychology</i> , 4th ed. Hoboken: Wiley. Dodd, P. and Sundheim, D. (2008). <i>The 25 Best Time Management Tools & Techniques: How to Get More Done Without Driving Yourself Crazy</i> . Chichester: Capstone. Cameron, E. and Green, M. (2015). <i>Making Sense of Change Management: A Complete Guide to the Models, Tools and Techniques of Organizational Change</i> . London: Kogan Page Publishers. Martin, J. (2014). <i>Managing Stress in the Workplace: How To Get Rid Of Stress At Work And Live A Longer Life</i> . Scotts Valley: CreateSpace Publishing. Allen, D. (2015). <i>Getting Things Done: The Art of Stress-Free Productivity</i> . London: Penguin Books. | | |

5.3.3 Lesson plans

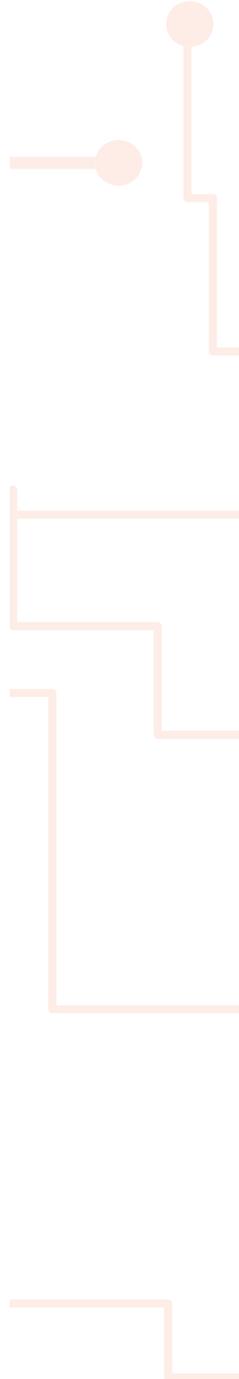
| LO Unit 1: Managing stress | | | 2.30 hours |
|----------------------------|--|---|-----------------|
| Time needed | Detailed content | Methodology | Name of Trainer |
| 5 mins | <ul style="list-style-type: none"> • Introduction of trainer and topics that will be presented • Identifying the previous knowledge of the presented topics | <ul style="list-style-type: none"> • Discussion | Mojca Poredoš |
| 30 mins | <p>Explanation of stress (flight or fight reaction; eustress vs. distress; general adaptation syndrome: alarm reaction, resistance, exhaustion; stress hormones) and how to recognise stress symptoms</p> <ul style="list-style-type: none"> • Understanding the causes of stress: What is a stressor? <ul style="list-style-type: none"> ◦ physical/task stressors (noise, heat, workload, number of working hours, etc.), and ◦ psychological stressors (lack of control, predictability, interpersonal conflict, role stressors, work-family conflict, etc.) • Consequences of stress: How does stress affect the functioning of the person? <ul style="list-style-type: none"> ◦ behavioural consequences (intimation processing, poor decision making, job performance, absence, lateness, accidents), ◦ psychological consequences (burnout, depression, anxiety, sleep problems, dissatisfaction), and ◦ physiological consequences (cardiovascular disease, gastrointestinal outcomes, back pain, headaches, biochemical outcomes). | <ul style="list-style-type: none"> • Ice breaker (counting to 3 in dyads) • Direct instruction • Discussion about stress (<i>How do you recognise stress?</i>) • discussion about stressors (<i>What makes you most stressed?</i>) and brainstorming on different stressors | Mojca Poredoš |
| 15 mins | | | |
| 25 mins | | | |
| 45 mins | | | |

| | | | |
|--|---|--|--|
| | <ul style="list-style-type: none"> • Coping with stress*: problem-focused coping (defining the problem, generating different solutions**) and emotion-focused coping (social support) <ul style="list-style-type: none"> ◦ techniques of stress prevention: progressive muscle relaxation, mindfulness, deep breathing, visualisation, writing your worries, humour. | <ul style="list-style-type: none"> • discussion about stress managing techniques (<i>What do you do to reduce stress?*</i>) • Brainwriting (team work) – <i>generating different solutions for problem X**</i> • practising stress prevention techniques (progressive muscle relaxation, mindfulness, etc.) | |
| <p>TEACHING MATERIALS:</p> <p>Landy, F.J. and Conte, J.M. (2013). <i>Work in the 21st Century: An Introduction to Industrial and Organisational Psychology</i>, 4th ed. Hoboken: Wiley.</p> <p>Cameron, E. and Green, M. (2015). <i>Making Sense of Change Management: A Complete Guide to the Models, Tools and Techniques of Organizational Change</i>. London: Kogan Page Publishers.</p> <p>Martin, J. (2014). <i>Managing Stress in the Workplace: How To Get Rid Of Stress At Work And Live A Longer Life</i>. Scotts Valley: CreateSpace Publishing.</p> <p>Allen, D. (2015). <i>Getting Things Done: The Art of Stress-Free Productivity</i>. London: Penguin Books.</p> | | | |

| LO Unit 2: Time management and prioritising | | | 2 hours |
|---|--|--|-----------------|
| Time needed | Detailed content | Methodology | Name of Trainer |
| 10 mins | <ul style="list-style-type: none"> • Time management and prioritising (what is time management; selecting priorities) | <ul style="list-style-type: none"> • motivational video (<i>Stop Wasting Time</i>) | Mojca Poredoš |
| 40 mins | <ul style="list-style-type: none"> • Prioritising (developing a plan of action for a job with many demands) and goal setting: <ul style="list-style-type: none"> ◦ in private life (identification of important life fields, definition of current state and desired state, designing SMART goals, which will help reach the desired state in each field), and ◦ in work life (matrix urgency – importance). | <ul style="list-style-type: none"> • model SMART for goal setting • using the wheel technique for the recognition of priorities • preparing personal urgency – importance matrix | |
| 40 mins | <ul style="list-style-type: none"> • Time management: <ul style="list-style-type: none"> ◦ daily/weekly work plan (to-do); most important tasks in the morning, ◦ "little tricks" of time management (habits, reserve time for important tasks, time limits, organising the environment), and ◦ identifying distractors (excessive socialising, excessive use of social media). | <ul style="list-style-type: none"> • development of personal work plan/ timetable • discussion, work in pairs and team work regarding difficulties with time management and time management strategies | |
| <p>TEACHING MATERIALS:</p> <p>Landy, F.J. and Conte, J.M. (2013). <i>Work in the 21st Century: An Introduction to Industrial and Organisational Psychology</i>, 4th ed. Hoboken: Wiley.</p> <p>Cameron, E. and Green, M. (2015). <i>Making Sense of Change Management: A Complete Guide to the Models, Tools and Techniques of Organizational Change</i>. London: Kogan Page Publishers.</p> <p>Martin, J. (2014). <i>Managing Stress in the Workplace: How To Get Rid Of Stress At Work And Live A Longer Life</i>. Scotts Valley: CreateSpace Publishing.</p> <p>Allen, D. (2015). <i>Getting Things Done: The Art of Stress-Free Productivity</i>. London: Penguin Books.</p> | | | |

| LO Unit 3: Managing changes | | | 3.30 hours |
|-----------------------------|--|--|-----------------|
| Numbers of hours/minutes | Detailed content | Methodology | Name of Trainer |
| 35 mins | <ul style="list-style-type: none"> • What is organisational change? Episodic and continuous change. • Barriers to change (structural inertia, work group inertia, threats to power, prior unsuccessful change efforts) • Concept of business agility, mobility and flexibility | <ul style="list-style-type: none"> • interactive lecture of theory | Mojca Poredoš |
| 35 mins | <ul style="list-style-type: none"> • Change management: <ul style="list-style-type: none"> ◦ individual change management (understanding people's reaction to change because of economic fear, fear of the unknown, fear of altered social relationships; how to overcome it) ◦ organisational change management (identifying the need for change, preparing a plan, methods of change leading such as coaching) | <ul style="list-style-type: none"> • SWOT technique for the preparation of a plan of change | |
| 20 mins | <ul style="list-style-type: none"> • Developing collaboration skills (active listening) <ul style="list-style-type: none"> ◦ active listening for better team work and general improvement of communication (being present and focused, summarising, paraphrasing, asking questions, giving/receiving feedback) | <ul style="list-style-type: none"> • tasks for different skills of active listening and improvement of communication skills | |

| | | | |
|--|--|---|---------------|
| 75 mins | <ul style="list-style-type: none"> • Personal development and continuous training, using results from questionnaires and the I DO ARRT principle <ul style="list-style-type: none"> ◦ filling in the questionnaire and evaluating questionnaires ◦ using personal results for the preparation of a personal development plan (using the I DO ARRT principle) | <ul style="list-style-type: none"> • questionnaire of career anchors and values • discussion of personal results in dyads • preparation of a personal development plan using the I DO ARRT principle | Mojca Poredoš |
| <p>TEACHING MATERIALS:</p> <p>Landy, F.J. and Conte, J.M. (2013). <i>Work in the 21st Century: An Introduction to Industrial and Organisational Psychology</i>, 4th ed. Hoboken: Wiley.</p> <p>Cameron, E. and Green, M. (2015). <i>Making Sense of Change Management: A Complete Guide to the Models, Tools and Techniques of Organizational Change</i>. London: Kogan Page Publishers.</p> <p>Martin, J. (2014). <i>Managing Stress in the Workplace: How to Get Rid of Stress at Work and Live a Longer Life</i>. Scotts Valley: CreateSpace Publishing.</p> <p>Allen, D. (2015). <i>Getting Things Done: The Art of Stress-Free Productivity</i>. London: Penguin Books.</p> | | | |



6. Conclusion

The SLS project pursued two horizontal priorities: to achieve relevant and high quality knowledge, skills, and competences in VET in logistics and transport, and to open to innovative teaching practices in the digital era. We can proudly claim that both priorities have been achieved.

The relevance and high quality of the knowledge and skills that we constructed through the Summer Logistics School together with the participating students and teachers were ensured by building the summer school programme on the gap between the results of the analysis of secondary school curricula and the analysis of the transport and logistics industry needs. Thus, we were able to design and test a tailor-made learner-centred course that takes into consideration the learning needs of VET students and teachers as well as the target needs of the industry.

All training modules rely on the use of modern digital tools that have enabled the participating students and teachers to bridge the gap between theoretical factual knowledge and procedural skills. The presentation and use of real-life case studies but primarily the introduction of simulators, realia, and professional software (WMS, TMS) into the teaching process will make our student participants better equipped for entry to the national and international labour market. On the other hand, the participating teachers have been able to see how teaching methodology different from direct instruction can benefit the learning process. Importantly, the cooperation between instructors from the transport and logistics industry and academics has yielded up-to-date knowledge and skills, and brought current transport and logistics trends into the classrooms and computer labs.

The fact that the Summer Logistics School has been divided into training modules and then further into learning outcome units means that its curriculum can flexibly be borrowed, upgraded, and adjusted to each user's needs. In addition, the use of ECVET premises and ter-

minology means facilitated transfer of the training modules or learning outcome units across all European VET contexts.

At the beginning of the SLS project we did not know what the structure, content, and teaching methodology of the Summer Logistics School would be. Now we can claim that the curriculum that we have developed meets all educational objectives as defined by the Council of the European Union (2009). It enhances national and international mobility, improves the quality and efficiency of VET education and training, and enhances creativity and innovation at VET Level 4 in the field of transport and logistics. We do hope that this Training Handbook will be a useful and relevant tool to those readers aiming to design and organise a similar summer school or to integrate some among the training modules or learning outcome units into their curricula.

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