



Sustainable Modular Houses for People in Need

2021-1-EL01-KA220-VET-000025502

## INTELLECTUAL OUTPUT 2

VET online course

“Sustainable Modular Houses for  
People in Need”

Job profile / **Manager**

Learning Units & Outcomes



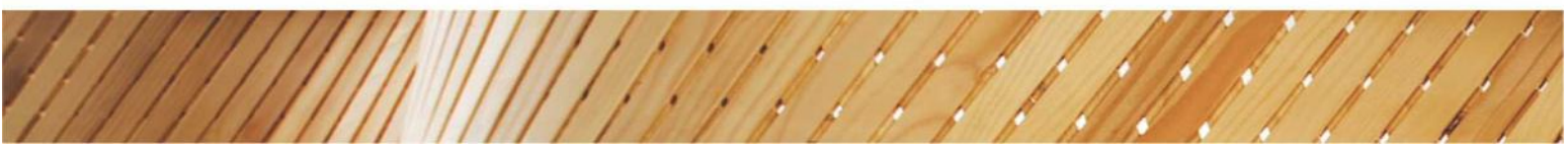
## Job profile

Job Title	Manager of Sustainable Modular Houses for People in Need.
EQF Level	Level 5 Post-Secondary Qualification (professional specialization)
Job description	<p>A manager of sustainable modular houses oversees the construction, design, and sale of environmentally friendly and sustainable modular homes. They lead a team of designers, architects, and builders to ensure the homes are built to the highest standards of quality and sustainability, while also marketing and selling the homes. The manager must have knowledge of sustainable building practices, construction management, project management, and stay up-to-date with regulations and codes.</p>
Entry requirements	<ul style="list-style-type: none"><li>o EQF level 5 completed</li><li>o Interest in acquire specialized knowledge in sustainable modular houses</li><li>o At least one year work experience in sustainable modular houses management, production operations</li><li>o Specialised, factual and theoretical knowledge within the field of sustainable modular houses management and specific production operations</li></ul>



Activities	<ol style="list-style-type: none"> <li>1. Overseeing the design and construction of modular homes to ensure they meet high sustainability standards, while also adhering to local building codes and regulations.</li> <li>2. Collaborating with designers, architects, and engineers to develop plans and blueprints for sustainable modular homes that meet customer needs and preferences.</li> <li>3. Sourcing materials and supplies that are eco-friendly and sustainable, such as recycled materials, low-emitting insulation, and energy-efficient appliances.</li> <li>4. Managing construction timelines and budgets to ensure projects are completed on time and within budget, while maintaining quality standards.</li> <li>5. Ensuring that the construction process is efficient and safe, with minimal waste and maximum energy efficiency.</li> <li>6. Coordinating with subcontractors and suppliers to ensure that they meet sustainability and quality standards.</li> <li>7. Developing marketing and sales strategies to promote the sustainable modular homes to potential customers.</li> <li>8. Networking with industry professionals, such as real estate agents and contractors, to build relationships and expand business opportunities.</li> <li>9. Staying up-to-date with advances in sustainable building practices and technologies, and integrating them into design and construction processes.</li> <li>10. Maintaining customer relationships and providing ongoing support and service to ensure customer satisfaction and repeat business.</li> </ol>
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<b>Level 5</b>	Comprehensive, expertise, factual and theoretical knowledge in a study/work-related topic and understanding the limitations of one's knowledge	Large range of cognitive and practical skills for conceiving creative solutions to abstract problems	Manage and supervise in study/work-related contexts, subject to unpredictable changes.
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## Learning Units

A Learning Unit consists of a coherent combination of learning outcomes, subject to evaluation and autonomous validation. Learning outcomes consist of knowledge, skills and competences that are mobilised in actions through which the individual shows / demonstrates mastery of the acquired learning outcome, in accordance with certain performance criteria and context conditions.

Learning Units		Responsibility
Learning Unit (LU) 1	NATURAL MATERIALS (TIMBER) AVAILABLE FOR BUILDINGS IN DIFFERENT REGIONS IN EUROPE	University of Belgrade (UOB)
Learning Unit (LU) 2	PRINCIPLES OF SUSTAINABLE DESIGN FOR MODULAR MICRO-UNITS	Institute of Wood Furniture & Wooden Packaging (IWFWP)
Learning Unit (LU) 3	METHODS FOR OFF-SITE MANUFACTURING	Case Lemn Bernard (CLM)
Learning Unit (LU) 4	FIRE SAFETY AND QUALITY CONTROL OF TIMBER MODULAR HOUSES	Atlantic Technological University (ATU)





## Learning Outcomes

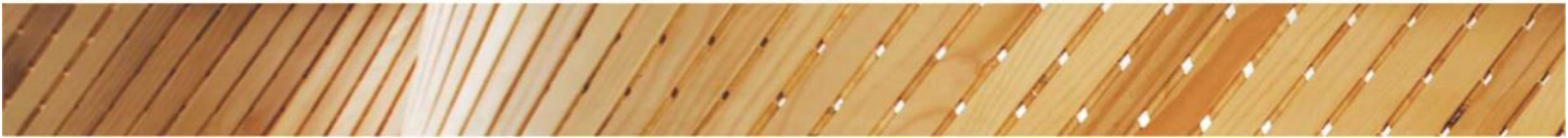


The Learning Outcomes break down into knowledge skills and competencies that are mobilized in actions/achievements through which the individual shows/ demonstrates the required field of competence, according to a certain performance criteria and context conditions.

### Learning Unit 1

LU1 refers to the various types of wood that are harvested and used for construction in different parts of Europe. The available timber species can vary by region, and can include softwoods such as spruce, pine and fir, as well as hardwoods like oak, beech, and ash. The material is harvested through a variety of methods, including clearcutting, selective logging, and sustainable forestry practices. Processing methods can include sawmilling, planing, and treating the wood for durability and insect resistance. Timber for construction is subject to different regulations and standards in each region, and must adhere to environmental certifications and legal requirements. Managing timber for construction involves understanding the properties and characteristics of different species, selecting appropriate types for different building applications, estimating quantities and costs, managing procurement and supply chain logistics, designing structures, ensuring durability and sustainability, and communicating effectively with stakeholders to promote the use of timber in sustainable building practices.

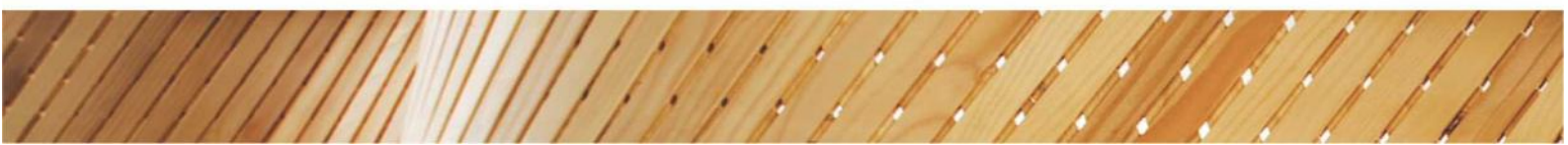
Learning Unit 1	NATURAL MATERIALS (TIMBER) AVAILABLE FOR BUILDINGS IN DIFFERENT REGIONS IN EUROPE
Sub-Contents	<ul style="list-style-type: none"> <li>○ Properties and characteristics of timber species</li> <li>○ Harvesting and production methods, and environmental impacts</li> <li>○ Sustainable forest management practices</li> <li>○ Regulations and standards for timber use in construction</li> <li>○ Timber selection, procurement, and supply chain logistics</li> <li>○ Estimating timber quantities, quality, and cost</li> </ul>





## Learning Outcomes

Knowledge	Skills	Competences
<p>Understand the characteristics and properties of various types of timber and how they can be used in construction.</p> <p>Gain knowledge of sustainable forestry practices and the environmental impact of using timber as a building material.</p> <p>Identify the different species of timber available in different regions of Europe and their specific uses.</p>	<p>Analyze the properties and characteristics of different types of timber available for construction in different regions in Europe.</p> <p>Understand the different harvesting and production methods for timber, and the associated environmental impacts.</p> <p>Identify the appropriate timber species for different building applications and design requirements.</p> <p>Develop skills in sustainable forest management practices to ensure a continued supply of high-quality timber for construction.</p> <p>Understand the regulations and standards related to timber use in construction, including environmental certifications and legal requirements.</p> <p>Develop skills in estimating timber quantities, quality and cost for building projects, and managing timber procurement and supply chain logistics.</p> <p>Understand the properties and limitations of timber as a building material and how to ensure its long-term durability and structural integrity.</p>	<p>Managers should be able to analyze, identify, and select appropriate timber species for various building applications, estimate timber quantities and costs, manage procurement and supply chain logistics, design timber structures and assemblies, understand sustainability principles and regulations, and effectively communicate with stakeholders. They will also develop skills in sustainable forest management practices and ensure the long-term durability and structural integrity of timber buildings.</p>
Main action / achievement:		Workload
<p>The main achievement is the ability to effectively and sustainably manage the entire lifecycle of timber for construction. This includes understanding timber properties, selecting appropriate species, estimating quantities and costs, managing procurement and logistics, designing structures, ensuring durability, and promoting sustainability. The outcome is a more sustainable and environmentally friendly construction industry.</p>		<p><b>25 hours</b></p>





## Learning Unit 2

LU2 refers to the incorporating environmentally conscious and energy-efficient practices into the design and construction of small living spaces. This includes the use of sustainable materials, such as recycled or renewable materials, and the incorporation of energy-efficient technologies, such as solar panels and efficient HVAC systems. The design should also maximize natural light and ventilation, and utilize space-saving techniques to optimize the use of the limited living space. Additionally, the units should be designed to minimize waste and have a low carbon footprint, with a focus on reducing energy consumption and water usage. The aim is to create functional, comfortable, and eco-friendly living spaces that promote sustainable living practices.

Learning Unit 2	PRINCIPLES OF SUSTAINABLE DESIGN FOR MODULAR MICRO-UNITS
Sub-Contents	<ul style="list-style-type: none"><li>○ Introduction to sustainable design principles for modular micro-units</li><li>○ Energy-efficient technologies and systems for small living spaces</li><li>○ Sustainable materials and construction methods</li><li>○ Maximizing natural light and ventilation in small spaces</li><li>○ Space-saving techniques and functional design</li><li>○ Reducing waste and minimizing environmental impact</li><li>○ Promoting sustainable living practices in micro-unit design.</li></ul>





## Learning Outcomes

Knowledge	Skills	Competences
<p>Understanding of the concept of sustainable design and its importance.</p> <p>Knowledge of various sustainable design strategies, including site planning, energy efficiency, water conservation, and material selection.</p> <p>Understanding of the principles of passive design.</p> <p>Familiarity with sustainable building standards, certifications.</p> <p>Knowledge of renewable energy technologies, such as solar panels and geothermal systems, and how they can be incorporated into modular micro-units.</p> <p>Understanding of the life cycle assessment of building materials and how it can inform sustainable design decisions.</p> <p>Knowledge of sustainable construction practices and how they can contribute to sustainable modular micro-unit design.</p> <p>Familiarity with regulations and policies related to sustainable design and construction.</p>	<p>Ability to identify sustainable design principles, including energy efficiency, use of sustainable materials, and incorporation of renewable energy sources.</p> <p>Proficiency in using software tools for modeling and simulation of sustainable design strategies, such as energy modeling software and life cycle assessment tools.</p> <p>Capacity to assess the environmental impact of different design choices and make informed decisions about sustainable design strategies.</p> <p>Knowledge of relevant codes and regulations related to sustainable design, and the ability to apply this knowledge to ensure compliance and safety.</p> <p>Expertise in evaluating the performance of sustainable design strategies and making data-driven decisions for continuous improvement.</p>	<p>Learners will develop competences in managing principles of sustainable design for modular micro-units by gaining knowledge and skills in sustainable building practices, functional design, and energy-efficient technologies. They will learn to evaluate environmental impact and implement eco-friendly materials and practices in the design and construction of micro-units. Learners will also develop competences in optimizing limited living space, selecting and implementing energy-efficient systems and technologies, and promoting sustainable living practices. Overall, the competences will enable learners to design and construct sustainable, functional, and energy-efficient micro-units that promote sustainable living practices.</p>
<p><b>Main action / achievement:</b></p>		<p><b>Workload</b></p>
<p>The main achievement is to design and construct energy-efficient and environmentally conscious small living spaces, which incorporate sustainable materials and construction methods, maximize natural light and ventilation, and use energy-efficient technologies and systems. Learners will be able to create functional, comfortable, and eco-friendly living spaces that promote sustainable living practices.</p>		<p><b>25 hours</b></p>







## Learning Unit 3

LU3 refers to the use of efficient and sustainable construction practices to produce homes in a controlled factory setting. This includes using sustainable and recyclable materials, optimizing the use of energy and resources, and reducing waste during the manufacturing process. The modular units are designed for easy transport and assembly on-site, reducing the need for extensive on-site construction and minimizing the environmental impact of the building process. The use of digital technology, such as building information modeling (BIM) and prefabrication, also allows for greater precision and efficiency in the manufacturing process. Ultimately, the aim is to create sustainable, high-quality housing that is affordable, energy-efficient, and easy to construct.

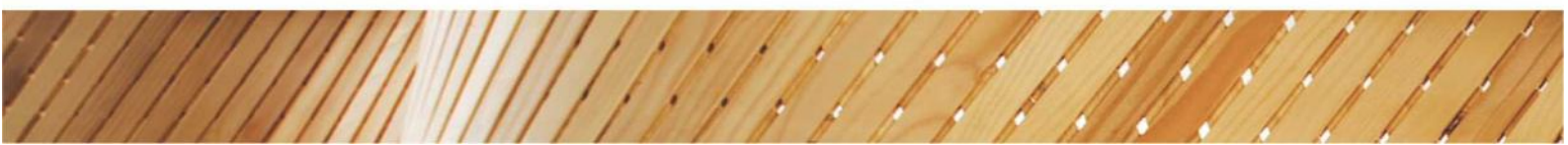
Learning Unit 3	METHODS FOR OFF-SITE MANUFACTURING
Sub-Contents	<ul style="list-style-type: none"><li>○ Overview of off-site manufacturing and its benefits</li><li>○ Sustainable building materials and their applications in off-site manufacturing</li><li>○ Digital technologies for efficient manufacturing processes</li><li>○ Quality control measures for off-site manufacturing</li><li>○ Transportation and logistics of modular units</li><li>○ On-site assembly and installation of modular units</li><li>○ Maintenance and repair of modular structures.</li></ul>





## Learning Outcomes

Knowledge	Skills	Competences
<p>Understanding the history and evolution of off-site manufacturing techniques.</p> <p>Familiarity with the different types of off-site manufacturing techniques and their advantages and disadvantages, including panelized systems, volumetric systems, and hybrid systems.</p> <p>Understanding the principles of design for manufacturability, including the use of standardized modules, minimizing waste, and ensuring efficient assembly.</p> <p>Knowledge of the different materials and components used in off-site manufacturing.</p> <p>Familiarity with the different software and technologies used in off-site manufacturing, such as computer-aided design and manufacturing, robotics, and automation.</p> <p>Understanding the role of quality control and testing to ensure structural integrity, durability, and safety of the finished product.</p>	<p>Understanding the principles of off-site manufacturing and how it can be applied to the production of timber modular houses.</p> <p>Identifying appropriate materials, machinery, and equipment required for off-site manufacturing of timber modular houses.</p> <p>Developing and implementing production schedules and project plans to ensure efficient and timely manufacturing.</p> <p>Developing and implementing quality control measures to ensure compliance with manufacturing standards and regulations.</p> <p>Managing and supervising teams of workers and contractors involved in off-site manufacturing.</p> <p>Identifying potential manufacturing issues and developing strategies to address them.</p>	<p>Learners will develop competences by gaining knowledge and skills in prefabrication, modular construction, and quality control. They will learn to evaluate different off-site manufacturing methods, select appropriate materials and technologies, and ensure quality control measures are in place throughout the manufacturing process. Learners will also develop competences in optimizing production processes, managing project schedules and budgets, and implementing effective communication strategies with stakeholders. Overall, the competences will enable them to efficiently and effectively manage the manufacturing process for modular micro-units, resulting in high-quality, cost-effective, and sustainable construction projects.</p>
<p><b>Main action / achievement:</b></p>		<p><b>Workload</b></p>
<p>The main achievement is to design and construct sustainable and energy-efficient modular timber micro-units with quality control procedures, ensuring a durable and safe structure that meets the highest standards. Learners will understand the benefits and challenges of off-site manufacturing and sustainable building materials and will be able to oversee the transportation and logistics of modular units and on-site assembly and installation. They will also develop an understanding of quality control measures and maintenance and repair of modular structures.</p>		<p><b>25 hours</b></p>





## Learning Unit 4

LU2 refers to the fire safety and quality control which are crucial aspects of timber modular houses. The use of timber as a building material requires careful consideration of fire safety measures, including the use of fire-resistant materials, smoke alarms, and sprinkler systems. Quality control is also essential to ensure that the timber used in construction is of high quality and free from defects that could compromise the safety and durability of the structure. Quality control measures can include regular inspections of the timber during the manufacturing process and on-site assembly, as well as testing for strength and durability. Proper installation of fire safety measures and quality control procedures can ensure the safety and longevity of timber modular houses.

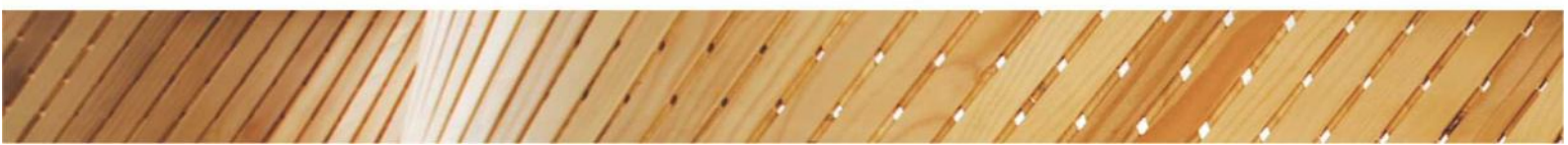
Learning Unit 4	FIRE SAFETY AND QUALITY CONTROL OF TIMBER MODULAR HOUSES
Sub-Contents	<ul style="list-style-type: none"><li>○ Fire safety regulations and requirements for timber modular houses</li><li>○ Types of fire-resistant materials and their applications</li><li>○ Smoke detection and suppression systems</li><li>○ Quality control procedures for timber selection, production, and assembly</li><li>○ Inspection and testing for strength and durability</li><li>○ Maintenance and repair of timber structures</li><li>○ Training and education for fire safety and quality control measures.</li></ul>





## Learning Outcomes

Knowledge	Skills	Competences
<p>Understanding of relevant building codes, standards, and regulations related to fire safety and quality control in timber modular construction.</p> <p>Knowledge of different types of timber and their fire-resistant properties, as well as fire-retardant treatments and coatings that can enhance the fire safety of timber structures.</p> <p>Knowledge of fire safety measures for timber modular houses, including fire-resistant barriers, fire suppression systems, and fire alarms.</p> <p>Understanding of quality control measures for timber modular construction, such as material testing, manufacturing standards, and inspection and testing protocols.</p>	<p>Conducting fire risk assessments and implementing fire safety plans to ensure the safety of occupants and compliance with regulations.</p> <p>Evaluating different fire protection systems and materials to select appropriate options for specific project requirements.</p> <p>Implementing quality control measures throughout the construction process to ensure compliance with standards and regulations.</p> <p>Identifying potential quality control issues and developing strategies to address them.</p> <p>Conducting inspections and tests to ensure the safety and quality of completed timber modular houses.</p> <p>Developing and implementing procedures for ongoing maintenance and safety checks to ensure long-term safety and durability of timber modular houses.</p>	<p>Learners will develop competences by gaining knowledge and skills in fire protection systems, fire-resistant materials, and quality control processes. They will learn to evaluate different fire protection systems and materials, select appropriate options for specific project requirements, and implement quality control measures throughout the construction process. Learners will also develop competences in fire safety planning, conducting fire risk assessments, and ensuring compliance with relevant regulations and standards. Overall, the competences will enable them to ensure the safety of timber modular houses and implement effective quality control measures, resulting in high-quality and safe construction projects.</p>
<p><b>Main action / achievement:</b></p>		<p><b>Workload</b></p>
<p>The main achievement is to design and construct fire-safe and durable timber modular houses with quality control procedures, ensuring a safe and sustainable structure that meets the highest standards. Learners will understand fire safety regulations and requirements for timber modular houses, types of fire-resistant materials and their applications, and smoke detection and suppression systems. They will be able to implement quality control procedures for timber selection, production, and assembly and will also develop an understanding of inspection and testing for strength and durability and maintenance and repair of timber structures.</p>		<p><b>25 hours</b></p>







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