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MODULE DESCRIPTION

Originating Institutions	Module Co-ordinator(s)
Vilnius Gediminas Technical University (VGTU)	Assoc. Prof. Dr Laura Tupenaite Assoc. Prof. Dr Tomas Gecys Assoc. Prof. Dr Loreta Kanapeckiene
VIA University College (VIA UC)	Instructor Jan Uwe Wolf
Coventry University (COVUNI)	Assist. Prof. Carl Mills Assist. Prof. David Trujillo
Häme University of Applied Sciences (HAMK)	Lector Jari Komsu Lector Anssi Knuutila
Riga Technical University (RTU)	Prof. Ineta Geipele Dr. Kristine Fedotova Janis Zvirgzdins

TITLE OF THE MODULE

Title of the module	Module code ¹
Design, Construction and Management of Wooden Public Buildings	

PROGRAMME(S) IN WHICH TO BE OFFERED

Civil Engineering, Construction and Real Estate Management (VGTU)
Architectural Technology and Construction Management, Civil Engineering (VIA UC)
Architectural Technology, Civil Engineering (COVUNI)
Civil Engineering (HAMK)
Real Estate Management (RTU)

LEVEL OF STUDIES²

First cycle (BSc/BA) <input checked="" type="checkbox"/>	Second cycle (MSc/MA) <input type="checkbox"/>	Third cycle (PhD) <input type="checkbox"/>
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CREDITS AND LEARNING HOURS

ECTS Value ³	Indicative academic learning hours ⁴	Length (in Semesters) ⁵
9	250	1

¹ To be indicated by the Institution

² According to the Framework of Qualifications for the European Higher Education Area, Annex 8: http://www.aic.lv/ace/ace_disk/Bologna/Bergen_conf/Reports/EQFreport.pdf

³ European Credit Transfer System, 1 ECTS = 25-30 academic learning hours. Please refer to ECTS Users' Guide: https://ec.europa.eu/education/ects/users-guide/docs/ects-users-guide_en.pdf

⁴ 1 academic learning hour is equal to 45 minutes

⁵ Indicate 0.5, 1, 1.5 or 2



DISTRIBUTION OF LEARNING HOURS

Lectures	Self-studies	Project based learning/guidance from teachers	Total
60	60	130	250

ANNOTATION OF THE MODULE⁶

The module provides understanding of wooden construction in the context of sustainable development, introduces wood as construction resource and material, architectural and structural design principles of sustainable wooden public buildings, describes construction process and its management, use and maintenance issues, provides best practice examples.

The theory and methodology of the module are mastered during lectures, by studying professional literature and interactive sources. Special and general skills are developed by project based learning and blended learning approaches.

AIM OF THE MODULE

The aim of the module is to introduce students to the theory and methods of design, construction and management of sustainable wooden public buildings.

LEARNING AND TEACHING STRATEGIES

The basis of the course is formed around the education methodologies “problem-based learning”, “learning by doing” and “blended learning”.

Small transdisciplinary groups consisting of 5–6 students shall be formed. It is recommended to include architectural technology, civil engineering, construction and real estate management students.

The course contains three main parts: theoretical face-to-face lectures (25% of all hours), practical teamwork on project (50% of all hours) and virtual learning (25% of all hours).

Face-to-face lectures must be delivered by the transdisciplinary group of teachers.

Project work of students is guided by prepared assignment, real site visits and instructors. Students have to develop a proposal for the client for the new sustainable public wooden building. Project work is divided into building planning and management phases, used in the building design and construction sector, namely:

Brief phase

⁶ Please provide brief summary of the module, limited to 200 words



Requirements for the project are decided by the Client or Client advisors and the Architect.

Outline proposal phase

- ✓ Preliminary small scale drawings showing form and function of project.
- ✓ Building components, materials and form and function to be decided.

Scheme Design proposal phase

All fundament decisions are made and all major problems are solved in this phase.

Detail 1 phase

Drawings and documents for final local authority approval must be completed.

Detail 2 phase (Working drawings)

Detail 2 phase is based on Detail 1 phase. Explicit detailing of the project is made to such a degree that it can be tendered for bids and realization of the projects implementation.

Each group was required to develop the following outputs: precedence analysis; sustainability and BREEAM design considerations; concept design with plans, sections, elevations and 3D illustration; technical excellence including sizes and types of timber, connections, foundations and specification; identification of services, U-values, fire, humidity, ventilation, drainage, lighting, pathways of escapes and DDA compliance (access for disabilities); the programme of works, costings, life cycle analysis, site management, health and safety requirements; presentation of final project in PowerPoint format.

Virtual learning encompasses individual studies of learning materials (readings, presentations, video materials, etc.) online at Moodle environment. In this way e-learning is combined with traditional classroom methods and problem-based learning approach.

Students have to prepare a report and final 20 minutes presentation of the project to be defended against jury of teachers. Grades are given by the jury using the ECTS scale, based on achieved learning outcomes.



INTENDED LEARNING OUTCOMES AND ASSESSMENT

Learning Outcomes of the module⁷	Methods of studies	Assessment methods of student achievements⁸	Assessments criteria of students achievements by assessment levels
O1. Knows different design and construction methods (load bearing systems) in wood	Problem based learning Blended learning	<input checked="" type="checkbox"/> Problematic questions <input checked="" type="checkbox"/> Intelligent tests <input type="checkbox"/> Regular tests <input checked="" type="checkbox"/> Problematic tasks <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Peer evaluation <input type="checkbox"/> Automated feedback <input checked="" type="checkbox"/> Final evaluation	<i>Threshold achievement level</i> Knows different design and construction methods (load bearing systems) in wood, but has limited understanding of application
			<i>Typical achievement level</i> Knows different design and construction methods (load bearing systems) in wood, has application skills
			<i>Excellent achievement level</i> Knows different design and construction methods (load bearing systems) in wood, has advanced application skills
O2. Knows and understands structural design principles of public wooden buildings	Problem based learning Blended learning	<input checked="" type="checkbox"/> Problematic questions <input type="checkbox"/> Intelligent tests <input type="checkbox"/> Regular tests <input checked="" type="checkbox"/> Problematic tasks <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Peer evaluation <input type="checkbox"/> Automated feedback <input checked="" type="checkbox"/> Final evaluation	<i>Threshold achievement level</i> Knows and understands structural design principles of public wooden buildings, has minimum application skills
			<i>Typical achievement level</i> Knows and understands structural design principles of public wooden buildings, has application skills
			<i>Excellent achievement level</i> Knows and understands structural design principles of public wooden buildings, has advanced application skills

⁷ Learning outcomes are specified in three categories – as **knowledge, skills and competence**. This signals that qualifications – in different combinations – capture a broad scope of learning outcomes, including theoretical knowledge, practical and technical skills, and social competences where the ability to work with others will be crucial. Please refer to Cedefop (2017). Defining, writing and applying learning outcomes: a European handbook. Luxembourg: Publications Office of the European Union. https://www.cedefop.europa.eu/files/4156_en.pdf.

⁸ Please select from the list. Additional assessment methods may be added.



Sustainable Public Buildings Designed and Constructed in Wood (Pub-Wood)

O3. Knows and understands construction site management process	Problem based learning Blended learning	<input checked="" type="checkbox"/> Problematic questions <input type="checkbox"/> Intelligent tests <input type="checkbox"/> Regular tests <input checked="" type="checkbox"/> Problematic tasks <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Peer evaluation <input type="checkbox"/> Automated feedback <input checked="" type="checkbox"/> Final evaluation	<i>Threshold achievement level</i> Knows and understands construction site management process, is able to draw simple plans
			<i>Typical achievement level</i> Knows and understands construction site management process, is able to draw plans
			<i>Excellent achievement level</i> Knows and understands construction site management process, is able to draw detail plans
O4. Knows and understands maintenance principles of wooden public buildings	Problem based learning Blended learning	<input checked="" type="checkbox"/> Problematic questions <input type="checkbox"/> Intelligent tests <input type="checkbox"/> Regular tests <input checked="" type="checkbox"/> Problematic tasks <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Peer evaluation <input type="checkbox"/> Automated feedback <input checked="" type="checkbox"/> Final evaluation	<i>Threshold achievement level</i> Knows and understands maintenance principles of wooden public buildings, has limited skills to develop maintenance plan
			<i>Typical achievement level</i> Knows and understands maintenance principles of wooden public buildings, is able to develop maintenance plan
			<i>Excellent achievement level</i> Knows and understands maintenance principles of wooden public buildings, is able to develop detail maintenance plan
O6. Has social skills: group work, critical thinking, problem solving skills	Problem based learning	<input type="checkbox"/> Problematic questions <input type="checkbox"/> Intelligent tests <input type="checkbox"/> Regular tests <input type="checkbox"/> Problematic tasks <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Peer evaluation <input type="checkbox"/> Automated feedback <input checked="" type="checkbox"/> Final evaluation	<i>Threshold achievement level</i> Has minimal group work, critical thinking, problem solving skills
			<i>Typical achievement level</i> Has developed group work, critical thinking, problem solving skills
			<i>Excellent achievement level</i> Has advanced group work, critical thinking, problem solving skills



MARK CALCULATION⁹:

Assessment components (in chronological order of submission/examination date)			
Type of assessment ¹⁰	Weighting, %	Duration	Component required ¹¹ pass
Test 1 (Design)	10%	30 min	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Test 2 (Construction)	10%	30 min	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Test 3 (Maintenance)	10%	30 min	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Mid-term assessment of the project	30%	Oral examination, 20 min	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Final assessment of the project	40%	Presentation 20 min	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Total:	100%		

LECTURE TOPICS

No.	Topic ¹²	Number of hours
1.	Introduction to the course	2
2.	Sustainable development and wooden construction	2
3.	Wood as construction resource and material	4
4.	Architectural design of sustainable public wooden buildings	6
5.	Use of BIM	4
6.	Structural design of sustainable public wooden buildings	6
7.	Environmental impacts of wooden buildings	4
8.	Moisture performance of wooden buildings	4
9.	Fire safety assurance	4
10.	Acoustics and noise abatements	4
11.	Design of service systems	4
12.	Construction process (site) management	6
13.	Use and maintenance of wooden public buildings: use of digital technologies	4
14.	Maintenance and repair works	4
15.	Failure analysis	2
	Total:	60

⁹ Please list all components, sum must be equal to 100%. Note that successful course completion should be recognised as indicating worthwhile educational achievement.

¹⁰ Please indicate in chronological order of submission date each assessment component by type, e.g. examination, home work, coursework, project

¹¹ Indicate Yes to specify the assessment component(s) to be passed in order to pass the module

¹² Please add as many topics as needed



TASKS FOR PROJECT-BASED LEARNING

No.	Task ¹³	Number of hours
1.	Brief phase: analysis of requirements for the project by the Client or Client advisors, precedence analysis	5
2.	Sustainability and BREEAM design considerations	10
3.	Concept design with plans, sections, elevations and 3D illustration	20
4.	Technical excellence including sizes and types of timber, connections, foundations and specification	15
5.	Identification of services, U-values, fire, humidity, ventilation, drainage, lighting, pathways of escapes and DDA compliance (access for disabilities)	15
6.	Programme of works, costings, life cycle analysis, site management, health and safety requirements	15
7.	Scheme proposal	20
8.	Working drawings	20
9.	Presentation of final project in PowerPoint format	10
Total:		130

LEARNING MATERIALS¹⁴

Core materials (up to 5 references):

1. Handbook "Design, Construction and Management of Wooden Public Buildings". Pub-Wood, 2020.
2. Thisleton, W., & Bader, B. DETAIL 1-2/2018 - Timber Construction.

Supplementary materials (up to 10 references):

1. Zaya, A. F., & Diener, T. (2017). Heavy Timber Structures: Creating Comfort in Public Spaces. Schiffer.
2. Lennartz, M. W., & Jacob-Freitag, S. (2015). New Architecture in Wood. BIRKHÄUSER.
3. Breyer, D., Cobeen, K., Fridley, K., & Pollock, F. (2014). Design of Wood Structures-ASD/LRFD (7th ed.). McGraw-Hill Education.
4. Hugues, T., Steiger, L., & Weber, J. (2004). Timber Construction. BIRKHÄUSER.
5. Mayo, J. (2015). Solid Wood: Case Studies in Mass Timber Architecture, Technology and Design. Routledge.

On-line resources:

Available at Moodle environment: <http://kursai.vgtu.lt/course/view.php?id=5>

¹³ Please add as many tasks as needed

¹⁴ Courses should provide high quality materials to enable an independent learner to progress through self-study. Materials should make best use of online affordances as well as rich media (video and audio) to engage students with their learning.



REQUIRED IT RESOURCES¹⁵

No.	Software, manufacturer
1.	MS Word
2.	MS Excel
3.	MS Power Point
4.	Adobe Acrobat reader
5.	Revit/ArchiCad/AutoCad

¹⁵ Please add as many software as needed for the course