SUSTAIN-CE

# SUSTAIN-CE PROJECT

# Module 2 Construction Materials for Sustainability Syllabus

## COMMON SYLLABUS FOR MODULES/ COURSE MATERIALS

Co-funded by the Erasmus+ Programme of the European Union

TÜRKİYE ULUSAL AJANSI
TURKISH NATIONAL AGENCY

# SUSTAIN-CE Project

# Output name: Module 2 Construction Materials for Sustainability Syllabus

| Leading Partner: | İYTE/YU |
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**Document Revision History**

| Version | Date | Comment | Author(s) |
|---|---|---|---|
| 1.0 | 14 January 2022 | First Draft | İYTE/YU/AUTH |
| 2.0 | 14 October 2022 | Second Draft | İYTE/YU/AUTH |
| 3.0 | 31 May 2023 | Final Version | İYTE/YU/AUTH |

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**COURSE MATERIAL SYLLABUS**

| Module Topic | Applicable Civil Engineering Area/Design Course | Module Code | Total Course Hour | | University Credit | ECTS |
|---|---|---|---|---|---|---|
| | | | **Theory** | **Practice** | | |
| Construction Materials for Sustainability | XXX | SUSTAIN-CE 02 | 3 | 0 | | 3 |

| | |
|---|---|
| **Language of Instruction** | English |
| **Level of Course Material/Load Case/Module** | ☐Associate Degree (Short Cycle)<br>☒Undergraduate (First Cycle)<br>☐Graduate (Second Cycle)<br>☐Doctoral Course (Third Cycle) |
| **Prerequisite Course (s)** | N/A |
| **Special Pre-Conditions of the Course** | N/A |

| | | |
|---|---|---|
| **Course Coordinator** | | Mail:<br>Web: |
| **Course Instructor(s)** | | Mail:<br>Web: |
| **Course Assistant(s)/Tutor (s)** | | Mail:<br>Web: |

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| **Purpose and Background** | Construction materials have probably the most profound impact on the sustainability of the built environment. Almost 40 % of annual global material use takes place in the building construction sector and the landfilled construction and demolition (C&D) waste has one of the highest share. Due to the depletion of natural material sources and the voluminous C&D waste, a perspective that prioritizes sustainability and circular economy related aspects of construction materials is crucial.<br><br>In this module, construction materials will be re-assessed from a sustainability point of view and essential topics such as the use of secondary raw materials, sustainable natural materials (e.g., wood), the strategies to reduce the environmental impact of commonly used construction materials and truly sustainable material design principles will be addressed. Reuse and recycling of construction and demolition (C&D) waste within a circular economy framework will be presented and emerging topics such as material passports will be introduced. |
| **Module Content** | Sustainability related requirements of construction materials, conventional construction materials from a sustainability point of view, principles of truly sustainable construction materials and potential of natural material use in the construction sector, recycling and re-use of construction and demolition (C&D) waste, material passport. |
| **Learning Outcomes of the Course Material/Case Study/Module** | **Participants who complete this module will**<br>1. Define sustainability-related requirements of construction materials.<br>2. Recognize the sustainability-related problems of conventional construction materials and describe the strategies to improve them from a sustainability point of view.<br>3. Explain the principles of truly sustainable material design and the potential of natural material use (e.g., wood) in the construction sector.<br>4. Explain the impact and importance of recycling and re-use of construction and demolition (C&D) waste on sustainability.<br>5. Explain the importance of material passports in the context of material reuse, recycle and its connection with the digitalization of the construction sector. |

| MODULE OUTLINE/SCHEDULE (In hours) | | | |
|---|---|---|---|
| **Hours** | **Topics** | **Preliminary Preparation** | **Methodology and Implementation (theory, practice, assignment etc.)** |
| 3 | Sustainability related requirements of construction materials | Recommended readings from the VLE | Theory, practice |
| 3 | Conventional Construction Materials for Sustainability | Recommended readings from the VLE | Theory |
| 3 | Recycle and Reuse of Construction Materials | Recommended readings from the VLE | Theory, Practice |
| 3 | Material Passports | Recommended readings from the VLE | Theory |
| 3 | Innovative Construction Materials: Sustainability by Material Design | Recommended readings from the VLE | Theory |
| 3 | The Special Case of Wood | Recommended readings from the VLE | Theory |
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| **Required Material (s) /Reading(s)/Text Book (s)** | Recommended readings in the VLE: Construction Materials for Sustainability |
| **Recommended Material (s) /Reading(s) /Other** | |

| ASSESSMENT | | |
|---|---|---|
| **Activities/ Studies** | **NUMBER** | **WEIGHT in %** |
| Quiz | 6 | 30 |
| Assignment (s) | N/A | 0 |
| Project/ Final Project/ Dissertation and Preparation | 1 | 35 |
| Laboratory / Practice (Virtual Court, Studio Studies etc.) | N/A | 0 |
| Field Studies (Technical Visits) | N/A | 0 |
| Presentation/ Seminar | 1 | 10 |
| Examination/ | 1 | 25 |
| Other (Placement/Internship etc.) | | |
| **TOTAL** | | **100** |

| ECTS (STUDENT/PARTICIPANT WORKLOAD) | | | |
|---|---|---|---|
| **ACTIVITIES** | **NUMBER** | **HOURS** | **TOTAL WORKLOAD** |
| Module Teaching Hours | 6 | 3 | 18 |
| Preliminary Preparation and finalizing of course notes, further self-study | 6 | 2 | 12 |
| Quiz and Preparation for the Quiz | 6 | 2 | 12 |
| Assignment (s) | N/A | N/A | N/A |
| Final Project/ Dissertation and Preparation | 1 | 20 | 20 |
| Practice (Laboratory, Virtual Court, Studio Studies etc.) | N/A | N/A | N/A |
| Field Studies (Technical Visits, Investigate Visit etc.) | N/A | N/A | N/A |
| Presentation/ Seminars | 1 | 10 | 10 |
| Examinations | 1 | 10 | 10 |
| Other (Placement/Internship etc.) | N/A | N/A | N/A |
| **Total Workload** | N/A | N/A | **82** |
| **Total Workload/ 25** | N/A | N/A | **3,28** |
| **ECTS** | | | **3** |

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