# MEĐIMURJE POLYTECHNIC IN ČAKOVAC

# POLYTECHNIC OF MEĐIMURJE AND ČAKOVEC

## SYLLABUS COURSE

ACADEMIC YEAR: 2020/2021

### 1. GENERAL INFORMATION ABOUT THE COURSE

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| **1.1. Course title** | **Construction technology I** | | | |
| **1.2. Study program (s)** | Undergraduate professional study Sustainable Development | | | |
| **1.3. Course status (O, I)** | Mandatory | **1.6. Teaching methods (number of hours)** | **Lectures** | 30 |
| **1.4. Course code** | | | **Exercises** | 15 |
| **1.5. Course abbreviation** | TG 1 | | **Seminar** | |
| **1.6. Semester** | III | | **E-learning** | |
| **1.7. Credit value (ECTS)** | 4 | **1.7. Place and time of classes** | Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website | |

### 2. TEACHING STAFF

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| **2.1. Carrier** | mr. sc. Vladimir Križaić | **2.4. Assistant (s)** | |
| **2.2. Calling** | s. lecturer | **2.5. Title (s)** | |
| **2.3. Contact** | vkrizaic @ mev.hr | **2.9. Contact / s** | |

### 3. COURSE DESCRIPTION

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| **3.1. Course objectives** | Acquisition of basic technological knowledge required for technology design and construction.<br>The rationality of construction technology in the system of project execution and practical work will enable the student to get to know and master the construction technologies related to the construction of primarily reinforced concrete structures. |
| **3.2. Requirements for enrollment and taking the course** | None |
| **3.3. Learning outcomes** | **After successfully completing the course, students will be able to:**<br>1. Rationally choose the most efficient form of construction technology<br>2. Rationally choose the most efficient form of auxiliary construction technology<br>3. Rational design of construction technologies<br>4. Optimally design the dimensioning of the performance of machines for building structures<br>5. Optimally design the dimensioning of the formwork and temporary structure for the construction of buildings<br>6. Design and manage simple construction technologies on the construction site or in the company's management<br>7. Design and manage prefabricated construction technologies on the construction site or in the company's management<br>8. Rationally choose the most efficient form of recycling system |

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| **3.4. Course content** | The course presents contents related to classical and modern technology of construction projects |

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| **3.5. Types of teaching** | x | Lectures | x | Exercises | | Blended e-learning | x | Independent tasks | | Laboratory |
| | | Seminars and workshops | | Distance education | | Field work | x | Multimedia and network | | Mentoring work |
| | | Other: | | | | | | | | |

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| **3.6. Performance language** | Croatian |

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| **3.7. Monitoring student work (enter the number of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit value of the course, 1 ECTS = 30 hours)** | 1,5 | Class attendance | | Seminar paper | | Essay |
| | 0.5 | Teaching activity | | Project | | Report |
| | 1,00 | Colloquia | | Practical work | | Continuous assessment |
| | 1.00 | Written exam | | Experimental work | | |
| | 1.00 | Oral exam | | Research | | |

**3.8. Assessment and evaluation of student work during classes and at the final exam**

| **Activity specification** | **Percentage%** | **points** |
|---|---|---|
| Evaluation during classes | | |
| Class attendance | 8% | 8 |
| Teaching activity | 2% | 2 |
| Practical work | | |
| Colloquium 1 | 45 % | 4 5 |
| Colloquium 2 | 45 % | 4 5 |
| *Evaluation of exam work for students who did not take the colloquium* | | |
| *Written exam* | *90 %* | *9 0* |
| **In total:** | **100%** | ***100*** |

**3.9. Evaluation criteria – elaboration by outcomes**

| | **Method of passing the outcome** | | | | | |
|---|---|---|---|---|---|---|
| | **Class attendance** | **Teaching activity** | **Colloquium 1** | **Colloquium 2** | **Practical work** | **In total** |
| Outcome 1 | | | 10 | 2. 5 | | 12.5 |
| Outcome 2 | | | 10 | 2.5 | | 12.5 |
| Outcome 3 | | | 10 | 2.5 | | 12.5 |
| Outcome 4 | | | 10 | 2.5 | | 12.5 |
| Outcome 5 | | | | 10 | | 10 |
| Outcome 6 | | | | 10 | | 10 |
| Outcome 7 | | | | 10 | | 10 |
| Outcome 8 | | | | 10 | | 10 |
| Outside the outcome | 8 | 2 | | | | 10 |
| **In total** | **8** | **2** | **40** | **50** | 0 | **100** |

Scoring outcomes (in order to pass the colloquium / exam the student must achieve at least 50% points for each learning outcome)

Rating Points

89 - 100 Excellent (5)

76 - 88 Very good (4)

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| | 63 - 75 Good (3)<br>5 1 - 62 Sufficient (2)<br>0 - 49 Insufficient (1) | |
| **3.10. Specifics related to taking the course** | If a student collects 50% of the points of each outcome, he / she directly takes the exam .<br>If a student does not achieve a sufficient number of points on the midterm exam, he / she cannot take the next midterm exam.<br>Once achieved points in intermediate exams for each learning outcome are no longer deleted unless the student decides to correct the result for a particular learning outcome, whereby the points won until then are deleted and newly achieved points for that learning outcome are entered.<br>The final grade is obtained on the exam period and is the sum of points earned during classes.<br>Students who did not take the colloquium access the written part of the exam where all learning outcomes are checked . | |
| **3.11. Student obligations** | Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises in order to exercise the right to take the exam.<br>Part-time students are required to attend at least 30% of the total number of hours of lectures and exercises in order to exercise the right to take the exam.<br>If the student has not fulfilled all the obligations provided by the course, he is obliged to attend the lectures again and meet the conditions for taking the exam.<br>Attendance can be offset by online consultations, organized webinars, and added assignments given by teachers. One lesson lasts 45 minutes, and several hours form a teaching unit. Absence from one teaching unit is counted as one absence. Delays and apologies are recorded separately. In that case, if the student missed more than 50% of classes, and has a justifiable reason / apology, a request should be submitted to the Department Council, which then decides on the justification of student absences with the obligatory opinion of the course leader. | |
| **3.12. Written works** | | |
| **3.13. Required reading** | 1. | Rudolf Lončarić: "Organization of construction projects", HDGI, 1995. |
| | 2. | Gorazd Bučar: "Carpentry, reinforcement and concrete works on the construction site", Faculty of Civil Engineering JJ Strossmayer in Osijek |
| | 3, | Vladimir Marčelja: Concrete and Components, National and University Library, Zagreb |
| | 4, | Velimir Ukrainczyk: Knowledge of the material, Textbooks of the University of Zagreb |
| | 5. | Vjeran Mlinarić, Tehnologija građenja, Zagreb: Hrvatska sveučilišna naklada: Tehničko veleučilište u Zagrebu, 2017. (Sveti Ivan Zelina: Tiskara Zelina). |
| **3.14. Supplementary literature** | 1. | Jovo Beslać: Materials in Architecture and Civil Engineering, National and University Library, Zagreb |
| | 2. | Dragan Arizanović: Technology of construction works, University of Belgrade |
| | 3. | Guenter Billigen , CIVIL ENGINEERING: basic level, translated from German by Branimir Petener. Zagreb: Školska knjiga, 2008. |
| | 4. | Eduard Slunjsk i, Strojevi u građevinarstvu, Zagreb: Hrvatsko drustvo građevinskih inženjera, 1995. |

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| | 5. | D ubravka Bjegović, Nina Štirmer , Theory and Technology of Concrete / - Zagreb: Faculty of Civil Engineering, 2015. - |

| **4. ADDITIONAL INFORMATION ABOUT THE COURSE** | |
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| **4.1. Quality control** | The quality of the program, teaching process, teaching skills and level of mastery of the material will be established by conducting a written evaluation based on questionnaires, and in other standardized ways and in accordance with the acts of the Polytechnic of Međimurje in Čakovec. |
| **4.2. Contacting the teacher** | Students can contact the teacher during the consultation period and during classes, while for short questions and explanations they can contact any day during working hours by coming in person or by landline. It is also possible to ask questions by e-mail, which will be answered in 48 hours at the latest. It is desirable that students come to the consultation as often as possible for any ambiguities. |
| **4.3. Informing about the course** | It is the obligation of each student to be regularly informed about the course. All notifications about the holding or possible postponement of classes will be posted on the bulletin board and on the website of the Polytechnic at least 24 hours in advance. |
| **4.4. The contribution the course to the study program** | Apply the basics of construction technologies through the creation and management of construction projects |

**5. DEVELOPMENT OF THEMATIC UNITS (the number of elaborated hours is identical to the number of lectures and exercises of the course)**

**LECTURES**

| **Hours** | **Topic and description of the lecture** | **Method of work**<br>• direct teaching (presentation, instruction, pp presentation)<br>• Discovery learning (independent, guided, discussion, debate)<br>• Group / collaborative learning<br>• case study<br>• field teaching… | **Lecture learning outcomes** | **Course learning outcome** |
|---|---|---|---|---|
| **1.** | Introduction to the course content, basics of construction technology | Presentation, pp presentation | Distinguish technology systems | I1 |
| **2.** | Basic settings of construction technology<br>Systematic and structural presentation of construction technology | Presentation, pp presentation | Distinguish construction technologies | I1 |
| **3.** | Earthwork technology, soil properties, performance and machine norm | Presentation, pp presentation | Distinguish resource properties | I2 |

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| **4.** | Technology of concrete and reinforced concrete works with technological scheme | Presentation, pp presentation | Use the technological scheme | I 3 |
| **5.** | Preparation of concrete works, production, transport and installation of fresh concrete with technological scheme | Presentation, pp presentation | Distinguish types of concrete | I 3 |
| **6.** | Types of concrete and techniques and technologies of production of concrete accessories, blocks and smaller elements<br>Equipment for laying concrete accessories - (production plants, systems, surfaces and lines | Presentation, pp presentation | Distinguish concrete accessories | I4 |
| **7.** | TEMPORARY STRUCTURES - Scaffolding and formwork | Presentation, pp presentation | Distinguish temporary systems | I5 |
| **8.** | Selection, planning and dimensioning of formwork systems and scaffolding | Presentation, pp presentation | Apply temporary systems | I5 |
| **9.** | Sizing of classical and modern formwork of vertical and horizontal constructions | Presentation, pp presentation | Apply formwork systems | I 5 |
| **10.** | Technology of masonry works - field teaching | Presentation, pp presentation | Apply wall technology | I 6 |
| **11.** | Technique and technology of production of prefabricated elements and assemblies | Presentation, pp presentation | Distinguish assembly technology | I 7 |
| **12.** | Selection and planning of application of assembly systems | Presentation, pp presentation | Use mounting technology | I 7 |
| **13.** | Demolition technology | Presentation, pp presentation | Explain demolition technology | I 8 |
| **14.** | Recycling technology | Presentation, pp presentation | Explain sustainability | I 8 |
| **15.** | Road curtain construction and recycling technology | Presentation, pp presentation | Explain sustainability | I8 |
| **EXERCISES / SEMINARS** | | | | |
| **Hours** | **Topic and description of the lecture** | **Method of work**<br>• direct teaching (presentation, instruction, pp presentation)<br>• Discovery learning (independent, guided, discussion, debate)<br>• Group / collaborative learning<br>• case study<br>• field teaching… | **Lecture learning outcomes** | **Course learning outcome** |

| | | | | |
|---|---|---|---|---|
| **1.** | Introduction to the course content, basics of construction technology | Presentation, pp presentation | Distinguish technology systems | I1 |
| **2.** | Basic settings of construction technology<br>Systematic and structural presentation of construction technology | Guided task, examples of systematic and structural modeling | Distinguish construction technologies | I1 |
| **3.** | Earthwork technology, soil properties, performance and machine norm | Guided task - performance / norm | Distinguish resource properties | I2 |
| **4.** | Technology of concrete and reinforced concrete works with technological scheme | Guided task - technological scheme of concrete | Use the technological scheme | I3 |
| **5.** | Preparation of concrete works, production, transport and installation of fresh concrete with technological scheme | Guided task - technological scheme of concrete | Distinguish types of concrete | I3 |
| **6.** | Types of concrete and techniques and technologies of production of concrete accessories, blocks and smaller elements<br>Equipment for laying concrete accessories - (production plants, systems, surfaces and lines | Independent development - web offer | Distinguish concrete accessories | I4 |
| **7.** | TEMPORARY STRUCTURES - Scaffolding and formwork | Guided task, examples of sizing | Distinguish and apply temporary systems | I5 |
| **8.** | Colloquium | Independent production | To rate | |
| **9.** | Selection, planning and dimensioning of formwork systems and scaffolding<br>Sizing of classical and modern formwork of vertical and horizontal constructions | Guided task, examples of sizing | Apply formwork systems | I5 |
| **10.** | Technology of masonry works - field teaching | Independent development - web offer | Apply masonry technology | I6 |
| **11.** | Technique and technology of production of prefabricated elements and assemblies | Guided task, examples of editing | Distinguish assembly technology | I7 |
| **12.** | Selection and planning of application of assembly systems | Guided task, examples of editing | Use mounting technology | I7 |
| **13.** | Demolition technology | Guided task, demolition examples | Explain demolition technology | I8 |
| **14.** | Road curtain construction and recycling technology | Guided task, examples of recycling | Explain sustainability | I8 |

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| **15.** | Colloquium | Independent production | To rate | |