

SYLLABUS

1. Program data

1.1 Higher education institution	Technical University of Cluj-Napoca
1.2 Faculty	Civil Engineering
1.3 Department	Buildings and Management
1.4 Field of study	Civil Engineering
1.5 Cycle of study	Bachelor of Science
1.6 Program of study/ Qualification	Civil Engineering
1.7 Form of education	IF - full time
1.8 Course code	52.00

2. Course data

2.1 Course title	Building technology II						
2.2 Subject area	Civil Engineering						
2.3 Course responsible/ lecturer	Lecturer PhD. ec. PhD. eng. Dorin MAIER dorin.maier@ccm.utcluj.ro						
2.4 Teachers in charge of seminars	Lecturer PhD. ec. PhD. eng. Dorin MAIER						
2.5 Year of study	IV	2.6 Semester	1	2.7 Evaluation	Exam	2.8 Course regime	DS/ DOB

3. Estimated total time

3.1 Number of hours / weeks	5	From which: 3.2 course	3	3.3 applications	2
3.4 Total hours in the curriculum	70	From which: 3.5 course	42	3.6 applications	28
Distribution of Time Fund					hours
Study by manual, course support, bibliography and notes					28
Additional documentation in the library, on electronic platforms and on the field					7
Training seminars / laboratories, themes, papers, portfolios, essays					20
Tutoring					2
Assessment					3
Other activities					-
3.7 Total hours of individual study	60				
3.8 Total hours on semester	130				
3.9 Number of credit points	5				

4. Pre-requisites (where appropriate)

4.1 From curriculum	Promoting discipline: Building Technology (I)
4.2 Competence	Not applicable

5. Requirements (where appropriate)

5.1. For the course	Room equipped with video projector. Students will not attend lectures with open mobile phones. Also, telephone conversations will not be tolerated during the course, nor students will leave the classroom for personal phone calls.
5.2. For the applications	The deadline for the submission of the project will be set by the teacher in agreement with the students. For late delivery of the project the mark will be down 1 point / day of delay

6. Specific competences

Professional competences	<p>C3.1 Description of technological processes for civil, industrial and agricultural construction. After passing the discipline the students will know: the execution technology of forming, reinforcing, concreting of reinforcing concrete elements or monolith reinforced concrete; method of construction by sliding; special procedures for concreting: vacuuming, centrifuging, vibropressing, torque casting, casting of concrete under water; assembly technology for prefabricated elements; machinery, technological equipment and means of transport for making monolithic and prefabricated reinforced concrete structures.</p> <p>C3.3 Designing the technological processes specific to the various phases of realization of the civil, industrial and agricultural construction elements for execution. After passing the discipline the students will be able to: prepare the excavation plan as well as the motion and the balancing plan of the embankments; choose the technological process for the construction of monolithic and prefabricated buildings; elaborate the technological process for constructions by sliding method; elaborates the technological process for building elements by vacuuming, centrifuging, vibropressing, torcreating etc.; choose the technical means (machines, equipment-technological installations, means of transport) for the construction; calculate and dimensioning the technological equipment (formwork); draw up the technological project for a construction (written pieces and drawings) using the technological processes..</p> <p>C3.5 Transposition of selected technologies into the technological project for civil, industrial and agricultural construction. After passing the discipline students will be able to: design the technological processes specific to the phases of realization of monolithic and prefabricated reinforced concrete elements; selects the execution technologies, the machinery, the means of transport and the technological equipment for building construction; transposes the technology of execution and the means of work selected in the technological process of building construction; elaborate technological sheets for the forming, reinforcement, concreting, decoking, prefabrication.</p>
Cross competences	<p>CT1 Apply effective responsive, punctuality, seriousness and personal responsibility strategies based on the principles, norms and values of professional ethics. Drafting and presenting a technical report in accordance with specific technical regulations;</p> <p>CT2 Applying efficient teamwork techniques on different hierarchical levels. Achieving a technological project in team with respect to the technical - scientific content.</p>

7. Course objectives (as results from the key competences gained)

7.1 General objective	Developing skills on how to build a building (technological processes and technical means).
7.2 Specific objective	Assimilation of knowledge on specific technologies for realization of monolithic and prefabricated reinforced concrete constructions and dimensioning of technological equipment

8. Content

8.1 Course	Teaching methods	Observations
<p>1. Designing the digging plan. The embankments movement and balance scheme</p> <p>2. <i>Formwork execution technology</i>: definitions, classifications, technical conditions and technological rules of the formwork</p> <p>3. <i>Formwork assembly and its component parts</i>: table, local stiffening elements, supports, bracings, supports, elements of assembly, alignment and security Vertical formwork for the construction of walls and pillars</p> <p>4. Horizontal formwork for the construction of beams and slabs; formwork for elevations and foundations. Formwork systems of industrial type</p> <p>5. Formwork calculus. Control and reception of the formwork, demoulding</p> <p>6. The execution technology of the constructions through sliding: sliding method; the composition of the sliding formwork</p> <p>7. <i>Reinforcement technology</i>: technical conditions and technological rules concerning reinforcement, processing, assembling and fitting of reinforcements.</p> <p>8. <i>Concreting execution technology</i>: concrete properties and factors that influence them, technological process of preparation and transport of concrete.</p> <p>9. Concrete casting (preparatory works, concreting technology rules, technological joints.</p> <p>10. Concrete compaction by vibration.</p> <p>11. Special procedures for concreting: vacuuming, centrifuging, vibropressing, casting, injection, casting concrete under water.</p> <p>12. <i>Mounting technology of prefabricated elements</i>: Transport and storage, hanging and handling / assembly of prefabricated elements. Types of equipment used to mount prefabricated elements.</p> <p>13. Operations and mounting methods. Mounting precast reinforced concrete elements to industrial halls</p> <p>14. Mounting of buildings from large prefabricated panels Technological design in construction: content and presentation of technological documentation</p>	Power Point Presentation	Video Projector
<p>Bibliography</p> <p>1. Domșa, J., Ionescu, A. – Utilaje, echipamente tehnologice și procedee performante de betonare, Editura OID.ICM, București, ISBN 973-9187-11-0, 1994</p> <p>2. Domșa, J., Vescan, V., Moga, A. – Tehnologia lucrărilor de construcții și tehnologii speciale, vol.I, Institutul Politehnic Cluj-Napoca, 1988</p> <p>3. Dinescu, T., Rădulescu, C. – Tehnica cofrajelor glisante, Editura Tehnică, București, 1981.</p> <p>4. Trelea, A., Popa, R., Giuscă, N., Domșa, J., Gheorghiță, S., ș.a. – Tehnologia construcțiilor, vol.I, Editura Dacia, Cluj-Napoca, ISBN 973-35-0603-6, 1997</p>		

8.2 Applications	Teaching methods	Observations
<p><i>Part I: Designing the technological sheet for the execution of a multi-level building</i></p> <p>- Project theme presentation and bibliographic material. Elaboration of the excavation plan;</p> <p>Establishing infrastructure technology. Recalculating job volumes and corrected antecedents. Drawing up the list of technological flows for the infrastructure</p> <p>Selection and calculation of equipment, technological equipment and means of transport, for infrastructure, sectorization, movement scheme and balancing of earthworks;</p> <p>Designing the Fact Sheets for Technological Flows to Infrastructure</p> <p>Preparation of the list of technological flows and segmentation of the superstructure.</p> <p>Choosing and calculating the equipment, technological equipment and means of transport for the superstructure;</p> <p>Design of the technological flow sheets for the superstructure;</p> <p>Drawing up of technological schemes for superstructure (drawings);</p> <p>Formwork design and calculation: compliance, load rating and sizing;</p> <p>Formation of dimensioned formwork (drawing). Drawing up the technical memo on infrastructure and superstructure.</p> <p><i>Part II: Design of the assembly technology for prefabricated elements of a fully prefabricated ground floor industrial hall</i></p> <p>- Calculation of the need for prefabricated elements by types. Choosing the devices necessary for the manipulation and assembly of the prefabricated elements.</p> <p>Drawing up the mounting sheet for the prefabricated elements;</p> <p>Choosing the optimal equipment necessary for the manipulation and assembly of the prefabricated elements;</p> <p>Drawing up the sheet with the mounting characteristics of the chosen machines;</p> <p>Design of technological schemes for two prefabricated elements (drawings);</p> <p>Design of overall technological schemes (drawings)</p>	Exposure; Applications	
<p>Bibliography</p> <p>5. NE-012 - Normativ pentru producerea betonului și executarea lucrărilor de construcții din beton, beton armat și beton precomprimat , partea 1/2007 - producerea betonului și partea 2/2010 - executarea lucrărilor din beton</p> <p>6. NE-013/2002 – Cod de practică pentru execuția elementelor prefabricate din beton, beton armat și beton precomprimat</p>		

7. IPC (Institutul de proiectare pt. construcții industriale), București – Tehnologii tip (tt): Cofraje, Armături, Betonarea, Montaj prefabricate, 1981 – 1983.
8. IPC (Institutul de proiectare pt. construcții industriale), București – proiect 7417/86, Catalogul general al mijloacelor tehnice necesare ramurii construcțiilor, vol.2, Mijloace de ridicat și manipulat.
9. IPC (Institutul de proiectare pentru construcții industriale), București – proiect 7207/80, Dispozitive de manipulare și montaj elemente prefabricate pentru construcții.

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

The contents cover fundamental themes of the discipline which ensure the familiarization of the students with the subject specific to the discipline.

The content of the discipline is addressed in an interdisciplinary way so as to stimulate the initiative, independence in thinking, critical analysis and creative thinking. This is the basis of students training for the necessary competences in the scientific research and the necessary professional and cross competencies of the graduates to efficient and creative solve the new work problems and situations;

10. Assessment

Activity type	10.1 Assessment criteria	10.2 Methods of assessment	10.3 Percentage of the final grade
10.4 Course	Written test	Written part – 2 hours	70 %
10.5 Applications	Submitting a project	Oral presentation	30 %
OBS: The written test is followed by its oral presentation (assessment of the papers in the presence of students).			
10.6 Minimum performance standard			
a) Eligibility for attendance at the exam: attendance at min. 12 (twelve) laboratory sessions and on-time delivery of the works. The project mark (will be written in the electronic catalogue): (P) min. 5 (five)			
(b) Theory mark (T): min. 5(five) The mark formula: $E = 0.7(T) + 0.3(P)$			
The condition of promoting / obtaining credits: $E \geq 5$, if $T \geq 5$, $P \geq 5$.			
OBS: The written part assessment is conditioned by presence on the course during the semester and by presenting and passing the applications works.			

Date of filling in: 10.09.2019	Titular	Title First name NAME	Signature
	Course	Lect. Dorin MAIER PhD eng. PhD ec	
	Applications	Lect. Dorin MAIER PhD eng. PhD ec	
Date of approval in CCM Department Council		CCM Department Director Conf.dr.eng. Claudiu ACIU	
Date of approval at the Faculty of Civil Engineering Council		Dean Conf.dr.eng. Nicolae CHIRA	