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 Subject code	52.00

2. Course data

2.1 Course title	**Building Technology II**						
2.2 Subject area	Civil Engineering						
2.3 Course responsible	Lecturer Dorin MAIER PhD eng. PhD ec. dorin.maier@ccm.utcluj.ro						
2.4 Seminar responsible	Lecturer Dorin MAIER PhD eng. PhD ec.						
2.5 Year of study	IV	2.6 Semester	1	2.7 Evaluation type	Exam	2.8 Course regime	DS DOB

3. Total estimated time

3.1 Number of hours / week	5	from which: 3.2 course	3	3.3 Seminar	2
3.4 Total hours in the curriculum	130	from which: 3.5 course	42	3.6 Seminar	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 T Total hours of individual study	60
3.8 Total hours on semester	130
3.9 Number of credits	5

4. Preconditions (where applicable)

4.1 from curriculum	Promoting discipline: Building Technology (I)
4.2 of competence	Not applicable

5. Conditions (where applicable)

5.1. for the course	Room equipped with video projector. Students will not attend lectures, works with open mobile phones. Also, telephone conversations will not be tolerated during the course, nor students leaving the classroom to pick up personal phone calls.
5.2. for the applications	Not applicable

6. Specific competences

Professional competences	C3.1 Description of technological processes for civil, industrial and agricultural construction. After passing the discipline the students will know: the technology for the execution of the forming, reinforcing, concreting elements of monolith reinforced concrete; execution technology of construction by sliding method; special procedures for putting concrete into operation: vacuuming, centrifuging, vibropressing, torque casting, casting of concrete under water; assembly technology for prefabricated elements; machinery, technological equipment and means of transport, which are made of monolithic and prefabricated reinforced concrete structures. C3.3 Designing the technological processes specific to the various stages of realization of the civil, industrial and agricultural construction elements for execution. After completing the discipline the students will be able to: prepare the excavation plan as well as the plan of motion and the balancing of the embankments; choose the technological process for the construction of monolithic and prefabricated buildings; elaborate the technological process for constructions by the 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 of the mentioned constructions; calculate and dimension technological equipment (formwork); draw up the technological project for a construction (written pieces and drawings) using the technological processes. 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.
Transversal Competences	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; CT2 Applying efficient teamwork techniques on different hierarchical levels. Achieving a technological project in team with respect to the technical - scientific content.

7. Course objective (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
1. Designing the digging plan, The embankments movement and balance scheme	Power Point presentation	Video Projector
2. *Formwork execution technology:* definitions, classifications, technical conditions and technological rules on the formwork		
3. *Formwork assembly and its component parts*: table, local stiffening elements, supports, bracings, supports, elements of assembly, alignment and security		

Vertical formwork for the construction of walls and pillars		
4. Horizontal formwork for the construction of beams and slabs; formwork for elevations and foundations. Formwork systems of industrial type		
5. Formwork calculus. Control and reception of the formwork, demoulding		
6. The execution technology of the constructions through sliding: sliding method; the composition of the sliding formwork		
7. *Reinforcement technology:* technical conditions and technological rules concerning reinforcement, processing, assembling and fitting of reinforcements.		
8. *Concreting execution technology:* concrete properties and factors that influence them, technological process of preparation and transport of concrete		
9. Concrete casting (preparatory works, concreting technology rules, technological joints)		
10. Concrete compaction by vibration		
11. Special procedures for concreting: vacuuming, centrifuging, vibropressing, casting, injection, casting concrete under water		
12. *Mounting technology of prefabricated elements:* Transport and storage, hanging and handling / assembly of prefabricated elements. Types of equipment used to mount prefabricated elements		
13. Operations and mounting methods. Mounting precast reinforced concrete elements to industrial halls		
14. Mounting of buildings from large prefabricated panels Technological design in construction: content and presentation of technological documentation.		

References

1. Domşa, J., Ionescu, A. – Utilaje, echipamente tehnologice şi procedee performante de betonare, Editura OID.ICM, Bucureşti, ISBN 973-9187-11-0, 1994
2. Domşa, J., Vescan, V., Moga, A. – Tehnologia lucrărilor de construcţii şi tehnologii speciale, vol.I, Institutul Politehnic Cluj-Napoca, 1988
3. Dinescu, T., Rădulescu, C. – Tehnica cofrajelor glisante, Editura Tehnică, Bucureşti,1981.
4. Trelea, A., Popa, R., Giuşcă, N., Domşa, J., Gheorghiţă, S., ş.a. – Tehnologia construcţiilor, vol.I, Editura Dacia, Cluj-Napoca, ISBN 973-35-0603-6, 1997
5. NE-012 - Normativ pentru producerea betonului şi executarea lucrărilor de construcţii din beton, beton armat şi beton precomprimat , partea 1/2007 - producerea betonului şi partea 2/2010 - executarea lucrărilor din beton

8.2 Seminar / laboratory / project	Teaching methods	Observations
Part I: Designing the technological sheet for the execution of a multi-level building - Project theme presentation and bibliographic material. Elaboration of the excavation plan;	Lecturing, Classroom discussion	
Establishing infrastructure technology. Recalculating work volumes and corrected antecedents. Drawing up the list of technological flows for the infrastructure		
Selection and calculation of equipment, technological equipment and means of transport,		

for infrastructure, sectorization, movement scheme and balancing of earthworks;		
Designing the Fact Sheets for Technological Flows to Infrastructure		
Preparation of the list of technological flows and segmentation of the superstructure.		
Choosing and calculating the equipment, technological equipment and means of transport for the superstructure;		
Design of the technological flow sheets for the superstructure;		
Drawing up of technological schemes for superstructure (drawings);		
Formwork design and calculation: compliance, load rating and sizing;		
Formation of dimensioned formwork (drawing).		
Drawing up the technical memo on infrastructure and superstructure.		
part II: Design of the assembly technology for prefabricated elements of a fully prefabricated ground floor industrial hall - Calculation of the need for prefabricated elements by types. Choosing the devices necessary for the manipulation and assembly of the prefabricated elements. Drawing up the mounting sheet for the prefabricated elements;		
- Choosing the optimal equipment necessary for the manipulation and assembly of the prefabricated elements; Drawing up the sheet with the mounting characteristics of the chosen machines;		
Design of technological schemes for two prefabricated elements (drawings); Design of overall technological schemes (drawings)		

References

. Trelea, A., Popa, R., Giuşcă, N., Domşa, J., Gheorghiţă, S., ş.a. – Tehnologia construcţiilor, vol.I, Editura Dacia, Cluj-Napoca, ISBN 973-35-0603-6, 1997
5. NE-012 - Normativ pentru producerea betonului şi executarea lucrărilor de construcţii din beton, beton armat şi beton precomprimat , partea 1/2007 - producerea betonului şi partea 2/2010 - executarea lucrărilor din beton
6. NE-013/2002 – Cod de practică pentru execuţia elementelor prefabricate din beton, beton armat şi beton precomprimat
7. IPC (Institutul de proiectare pt. construcţii industriale), Bucureşti – Tehnologii tip (tt): Cofraje, Armături, Betonarea, Montaj prefabricate, 1981 – 1983.
8. IPC (Institutul de proiectare pt. construcţii industriale), Bucureşti – proiect 7417/86, Catalogul general al mijloacelor tehnice necesare ramurii construcţiilor, vol.2, Mijloace de ridicat şi manipulat.
9. IPC (Institutul de proiectare pentru construcţii industriale), Bucureşti – proiect 7207/80, Dispozitive de manipulare şi montaj elemente prefabricate pentru construcţii.

9. Corroborating the contents of the discipline with the expectations of the epistemic community representatives, associations, professionals and employers in the field related to the program

The contents of the course cover fundamental themes 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, which underlie the training of students for the necessary competences in the scientific research in the field, the professional and transversal competencies necessary for the graduates to efficient and creative solve the problems and new working situations.

10. Assessment

Activity type	10.1 Assessment criteria	10.2 Assessment method	10.3 Final mark share
10.4 Course	Theory questions	Written part – 2 hours	70 %
10.5 Seminar	Assessment of the two works	Presenting project	30 %
OBS: The written test is followed by an oral assessment (assessment of the papers in presence of the students).			
10.6 Minimum performance standard			
The written part assessment is conditioned by a minimum presence on the course during the semester and by presenting and passing the applications works			

Date of completion:	**Teachers**	**Title First name NAME**	**Signature**
13.09.2018	Course	Șef. l. dr. ec. dr. ing. Dorin MAIER	
	Application	Șef. l. dr. ec. dr. ing. Dorin MAIER	

Date of endorsement in CCM Department Council	Director of the CCM Department Conf.dr.ing. Claudiu ACIU
Date of approval at the Faculty of Civil Engineering Council	Dean Conf.dr.ing. Nicolae CHIRA