



**TECHNICAL UNIVERSITY**  
OF CLUJ-NAPOCA, ROMANIA

## 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		Lecturer Dorin MAIER PhD eng. PhD ec.								
2.4	Course titular		Lecturer Dorin MAIER PhD eng. PhD ec.								
2.5	Year of study	IV	2.6	Semester	7	2.7	Evaluation	Exam	2.8	Course regime	DS/ DOB

### 3. Estimated total time

Year/ Sem.	Course title	Nb. of weeks	Course			Applications			Ind. Stud	TOTAL	Credits		
			[h/weeks]			[h/sem.]							
			S	L	P	S	L	P					
II	Building Technology II	14	3		2		42		28		60	130	5

3.1	Number of hours / week	5	3.2	From which: course	3	3.3	applications	2
3.4	Total hours in the curriculum	70	3.5	From which: course	42	3.6	applications	28
Individual study								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
Evaluation								3
Other activities								
3.7	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	Competence	Not applicable

### 5. Conditions (where applicable)

5.1	For the course	Not applicable
5.2	For the applications	Not applicable



## 6. Specific competences

Professional competences	Theoretical knowledge, (What they need to know)	<p>To know the technology of execution of the formwork, reinforcement, concrete building elements of monolithic reinforced concrete</p> <p>To know the technology of building construction by the sliding method</p> <p>To know the special methods of putting concrete into operation: vacuuming, centrifuging, vibropressing, torque casting, concrete casting under water</p> <p>Knowing the technology of mounting the prefabricated elements</p> <p>To know the equipments, technological equipments and means of transport that are made of monolithic and prefabricated reinforced concrete structures</p>
	Achieved Skills: (What they can do)	<p>After passing the discipline students will be able to:</p> <p>To elaborate the excavation plan as well as the plan of motion and balance sheet of embankments;</p> <p>To choose the technological process for the construction of monolithic and prefabricated buildings;</p> <p>To elaborate the technological process for constructions by the sliding method;</p> <p>To elaborate the technological process for building elements by vacuuming, centrifuging, vibropressing, torcreating etc.</p> <p>To choose the technical means (machines, equipment-technological installations, means of transport) for the construction of the mentioned constructions;</p> <p>Calculate and dimension technological equipment (formwork);</p> <p>To draw up the technological project for a construction (written pieces and drawings) using the technological processes.</p>
	Skilled skills: (What tools they can handle)	<p>After passing the discipline students will be able to:</p> <p>To design the technological processes specific to the construction stages of monolithic and prefabricated reinforced concrete structures;</p> <p>To select the construction technologies, the machinery, the means of transport and the technological equipment for building construction;</p> <p>To transpose the technology of execution and the means of work selected in the technological process of building construction;</p> <p>To draw up the technological data sheets for the forming, reinforcing, concrete, deco and prefabrication processes.</p>
Transversal competences	<p>Drafting and presenting a technical report in accordance with specific technical regulations;</p> <p>Achieving a technological project in a team with respect to the technical-scientific content</p>	

## 7. Discipline 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. Contents

8.1. Course (syllabus)		Teaching methods	Observations
1	Designing the digging plan, The embankments movement and balance scheme	Power Point presentation	Video-projector;
2	<i>Formwork execution technology</i> : definitions, classifications, technical conditions and technological rules on the formwork	Power Point presentation	Video-projector;
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	Power Point presentation	Video-projector;
4	Horizontal formwork for the construction of beams and slabs; formwork for elevations and foundations. Formwork systems of industrial type	Power Point presentation	Video-projector;
5	Formwork calculus. Control and reception of the formwork, demoulding	Power Point presentation	Video-projector;
6	The execution technology of the constructions through sliding: sliding method; the composition of the sliding formwork	Power Point presentation	Video-projector;
7	<i>Reinforcement technology</i> : technical conditions and technological rules concerning reinforcement, processing, assembling and fitting of reinforcements.	Power Point presentation	Video-projector;
8	<i>Concreting execution technology</i> : concrete properties and factors that influence them, technological process of preparation and transport of concrete	Power Point presentation	Video-projector;
9	Concrete casting (preparatory works, concreting technology rules, technological joints)	Power Point presentation	Video-projector;
10	Concrete compaction by vibration	Power Point presentation	Video-projector;
11	Special procedures for concreting: vacuuming, centrifuging, vibropressing, casting, injection, casting concrete under water	Power Point presentation	Video-projector;
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	Power Point presentation	Video-projector;
13	Operations and mounting methods. Mounting precast reinforced concrete elements to industrial halls	Power Point presentation	Video-projector;
14	Mounting of buildings from large prefabricated panels Technological design in construction: content and presentation of technological documentation.	Power Point presentation	Video-projector;
8.2. Applications (seminar/works/project)		Teaching methods	Observations
1	<i>Part I: Designing the technological sheet for the execution of a multi-level building</i> - Project theme presentation and bibliographic material. Elaboration of the excavation plan;	Presentations and applications	Typical infrastructure technologies
2	- Establishing infrastructure technology. Recalculating job volumes and corrected antecedents. Drawing up the list of technological flows for the infrastructure		
3	- Selection and calculation of equipment, technological equipment and means of transport, for infrastructure, sectorization, movement scheme and balancing of earthworks;	Presentations and applications	Catalogues with technical means for infrastructure
4	- Designing the Fact Sheets for Technological Flows to Infrastructure		
5	Preparation of the list of technological flows and segmentation of the superstructure.	Presentations and	Catalogues with technical



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6	- Choosing and calculating the equipment, technological equipment and means of transport for the superstructure;	applications	means for superstructure
7	- Design of the technological flow sheets for the superstructure;	Presentations and applications	Typical superstructure technologies
8	- Drawing up of technological schemes for superstructure (drawings);		
9	- Formwork design and calculation: compliance, load rating and sizing;	Presentations and applications	Norm NE 012/2-2010
10			
11	- Formation of dimensioned formwork (drawing). Drawing up the technical memo on infrastructure and superstructure.	Presentations and applications	Technological forms for formwork  Catalogues with handling and assembly devices
12	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;		
13	- 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;	Presentations and applications	Catalogues of machinery manipulation and assembly
14	- Design of technological schemes for two prefabricated elements (drawings); Design of overall technological schemes (drawings)		

**References**

- Domşa, J., Ionescu, A. – Utilaje, echipamente tehnologice și procedee performante de betonare, Editura OID.ICM, București, ISBN 973-9187-11-0, 1994
- Domşa, J., Vescan, V., Moga, A. – Tehnologia lucrărilor de construcții și tehnologii speciale, vol.I, Institutul Politehnic Cluj-Napoca, 1988
- Dinescu, T., Rădulescu, C. – Tehnica cofrajelor glisante, Editura Tehnică, București, 1981.
- Trelea, A., Popa, R., Giușcă, N., Domşa, J., Gheorghită, S., ș.a. – Tehnologia construcțiilor, vol.I, Editura Dacia, Cluj-Napoca, ISBN 973-35-0603-6, 1997
- 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
- NE-013/2002 – Cod de practică pentru execuția elementelor prefabricate din beton, beton armat și beton precomprimat
- IPC (Institutul de proiectare pt. construcții industriale), București – Tehnologii tip (tt): Cofraje, Armături, Betonarea, Montaj prefabricate, 1981 – 1983.
- 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.
- IPC (Institutul de proiectare pentru construcții industriale), București – proiect 7207/80, Dispozitive de manipulare și montaj elemente prefabricate pentru construcții.

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 acquired skills will be required for employees working in the technology and execution companies (construction sites, precast factories, concrete plants)



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### 10. Assessment

Activity type	10.1	Assessment criteria	10.2	Method of Assessment	10.3	The share of the final grade
Course		Written test		Written part		70%
Applications		Assessment of the two works		Oral part		30%
<b>10.4 Minimum performance standard</b>						
The written part assessment is conditioned by presence on the course during the semester and by presenting and passing the applications works						

Completion date  
Sept. 2017

Course titular  
Lect. Dorin MAIER PhD eng. PhD ec

The course teacher  
Lect. Dorin MAIER PhD eng. PhD ec

Department endorsement date  
Sept 2017

Head of the Department  
Associate Prof. Claudiu ACIU PhD eng