COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză) / Civil Engineering - CE

2. Course information

2.1.1 Course title				**Construcții metalice 1** **Steel Constructions 1**			
2.1.2. Course code				CE301			
2.2 Lecture instructor				Senior Lecturer Andrei-Octav AXINTE, PhD			
2.3 Laboratory instructor				Senior Lecturer Andrei-Octav AXINTE, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar		3.3b laboratory	1	3.3c project		3.3.d practical sessions
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar		3.6b laboratory	14	3.6c project		3.6.d

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	10
Additional research in the library, on specialised electronic platforms, and in the field	13
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	10
Assessment[8]	4
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	CE104/ Building Materials 1, CE113/ Building Materials 2, CE116/ Strength of Materials 1, CE205/ Strength of Materials 2, CE115/ Technical Drawing and Infographics 1, CE202/ Technical Drawing and Infographics 2.

5. Requirements

5.1 for the lecture[12]	- On-site: video projector, whiteboard, documentary films, etc.; - On-line: educational platform Google Classroom; - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the laboratory[13]	- Computing equipment (laptop/computer/video projector/software); - Steel and joint quality testing laboratory; - The deadlines for submitting papers are established by the head of the discipline, in agreement with the students.

6. General objective of the course

The lecture aims to introduce students to the general issues of steel structure constructions, focusing on their understanding of the properties of steel as a structural material for the purpose of its appropriate use in specific applications. On this regard, the following details are presented: the models and methods of global analysis for steel structures, the classification of structural elements sections, their strength and ductility and the constructive solutions of the joints with the appropriate analysis.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - explains the basic elements of steel constructions and the stages of a characteristic analysis; - compares the properties of steel and identifies steel grade, with the correct choice of grade and quality class; - evaluates the design characteristics of steel; - identifies technologies for making joints; - specifies constructive solutions for joints; - identifies the structural role of joints; - develops the ability to use the design codes for dimensioning/checking the joints of steel structures; - identifies corrosion and fire protection systems.
Skills	The student/ graduate: - uses digital tools for presenting papers and reports; - identifies and compares the types of rolled steel products for appropriate use in steel constructions; - identifies and collects information on the physical and mechanical properties of steels for use in technical projects; - identifies, collects, and evaluates information on the corrosion and high temperature behaviour of steel constructions, as well as specific protection systems; - identifies and compares the types of joints used in steel constructions and the necessary technologies; - identifies the loads in the joints, in correlation with their location within the structure; - selects and applies appropriate methods for the analysis of the joints.
Responsibility and autonomy	The student/ graduate: - complies with ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; - integrates into workgroups and applies effective relationship-building and teamwork techniques in multidisciplinary teams across different hierarchical levels; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; - develops professional projects in the field of engineering.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (experiments, demonstrations, modelling), as well as action-based methods, such as exercises, practical activities, problem-solving.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Structural applications of steel in Civil Engineering: advantages, disadvantages, further development	Interactive lecture, debates, explanations	2 hours
9.1.2. Steel qualities and steel products for structural steelwork: (1) Raw materials used in steel manufacturing; (2) Structural steel: manufacturing, casting, forming process – hot rolling and cold forming, section types, and size ranges; (3) Structural steel: introduction to metallurgy of steels, chemical composition of steel; (4) Designation		2 hours

systems for steels: steel grade, steel designated according to their application and mechanical or physical properties		
9.1.3. Engineering properties of structural steel: (1) Mechanical properties of structural steel, standard testing methods; (2) Standard testing procedures for steel material selection (tensile test, Charpy V-notch test, Brinell hardness test, rotating bending test for fatigue strength), physical properties, metallographic analysis of steel.	Interactive lecture, debates, explanations	2 hours
9.1.4. Behaviour of steels in corrosive environments and elevated temperature conditions. Protective measures.		4 hours
9.1.5. Design principles for steel structures: limit states, steel strength, partial safety coefficients, design methods, classification of cross-sections.		2 hours
9.1.6. Connection of steel members. Welded connections: (1) Welding methods, materials for welding, weldability, heat affected zone, distortions and residual stresses from welding, welding defects, quality control of welded connections; (2) Behaviour of welded connections under static and dynamic loadings, lamellar tearing; (3) Design of welded connections: classifications, geometrical characteristics, design examples for welded connections under various loading conditions.		8 hours
9.1.7. Bolted connections: (1) Ordinary bolts: advantages, disadvantages, mechanical classes, positioning of holes for bolts, long bolted connections, standard categories of bolted connections, load transfer mechanisms by shear and tension, design procedure for bolts working in shear and tension, design resistance of individual bolts, combined shear and tension; (2) High Strength Bolts: categories of bolted connections using HS bolts, advantages, disadvantages, tightening of HS bolts, design slip resistance, load transfer mechanism by tension, combined shear and tension, design examples of connections made using ordinary bolts and HS bolts under various loading conditions		8 hours
Reading list for the lecture: 1. Axinte A.O. (2025-26)- Steel constructions 1, Lectures notes 2. Axinte, E. (2008)- Elemente din oțel pentru construcții, Editura PIM Iași; 3. Axinte, E., Leiba, M., Axinte, A., Roșca, V., Teleman, C., Băetu, G., (2015) - Coroziunea și protecția anticorozivă a structurilor metalice, Editura Societății Academice "Matei - Teiu Botez" Iași; 4. Jaspart, J.P., Weynand, K., (2016) - Design of joints in steel and composite structures EC 3: Design of steel structures Part 1-8- Design of Joints EC 4: Design of composite steel and concrete structures Part 1-1 – General rules and rules for buildings, ECCS; 5. Subramanian, N., (2010) - Steel structures. Design and practice, Oxford University Press; 6. Dalban, C., Chesaru, E., Dima, S., Șerbescu, C. (1997), Construcții cu structură metalică, Editura Didactică și Pedagogică București; 7. SR EN 10025/1,2,3,4,5,6 -Oțeluri pentru construcții; 8. SR EN 1993-1-1/2006 Eurocod 3: Proiectarea structurilor din oțel. Partea 1-1: Reguli generale și reguli pentru clădiri; 9. SR EN 1993-1-2/2006 Eurocod 3: Proiectarea structurilor din oțel. Partea 1-2: Reguli generale. Calculul structurilor la foc; 10. SR EN 1993-1-8/2006 Eurocod 3: Proiectarea structurilor din oțel. Partea 1-8: Proiectarea îmbinărilor; 11. SR EN 1990:2004/A1:2006/NA:2006, Bazele proiectării structurilor.		
9.2b Laboratory	Work methods[17]	Observations, allotted time
9.2b.1 Structural steel products: Hot rolled and colt formed section types, size ranges. Graphic representation	Discussions, explanations, case studies, individual work	2 hours
9.2b.2 Steel components: Metallographic analysis of steel		2 hours
9.2b.3 Welded connections: Quality control of welded connections using ultrasonic defectoscopy		2 hours
9.2b.4 Welded connections: Design checks for welded connections.		2 hours
9.2b.5 Bolted connections: Mechanical classes, design checks of bolted connections.		2 hours
9.2b.6 Mechanical properties of steel: Notched impact test.		2 hours
9.2b.7 Mechanical properties of steel: Brinell hardness test.		2 hours
Reading list for the laboratory: 1. Axinte, A-O. (2025) - Note de aplicaţii; 2. Axinte, E. (2008) - Elemente din oțel pentru construcții, Editura PIM Iași; 3. Roșca, E.V., Axinte, E., (2010) - Evaluarea calității oțelurilor și a îmbinărilor sudate prin încercări fizico-mecanice, Editura Societății Academice "Matei-Teiu Botez" Iași 4. Teleman, E.C., Axinte, E. (2002) - Încercări privind calitatea oțelului și îmbinărilor elementelor de construcții metalice, Editura "Gheorghe Asachi" Iași 5. Jaspart, J.P., Weynand, K., (2016) - Design of joints in steel and composite structures EC 3: Design of steel structures Part 1-8- Design of Joints EC 4: Design of composite steel and concrete structures Part 1-1 – General rules and rules for buildings, ECCS 6. Dalban, C., Chesaru, C., Dima, E., Șerbescu C., (1997) - Construcții cu structură metalică, E.D.P. București 7. Mateescu, D., Caraba, I., (1980) - Construcții metalice. Proiectarea elementelor din oțel, Editura Tehnică București 8. Șerbescu, C., Pescaru, V., Axinte, E., (1980) - Exemple de calcul pentru construcții metalice, Tipar Rotaprint Institutul Politehnic Iași 9. SR EN 1993-1-8/2006 Eurocod 3: Proiectarea structurilor din oțel. Partea 1-8: Proiectarea îmbinărilor 10. ***ESDEP/WG 11		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	- summative assessment test (final assessment)	100%	50% (min. 5)
10.5b Laboratory	Ability to work in a team. Ability to apply acquired knowledge in practice in different contexts. Capacity for analysis, personal interpretation, originality, and creativity	- completion of laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		50% (min. 5)
10.6 Passing requirements - To know the steel grade and rolled steel sections, including their graphical representation; - To identify the types of joints for steel elements and understand how they work.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Andrei - Octav AXINTE, PhD

Laboratory instructor: Lecturer Andrei - Octav AXINTE, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Ioana - Sorina ENȚUC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstrations, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Organizare și management** **Construction management**			
2.1.2. Course code				CC302			
2.2 Lecture instructor				Professor Adrian - Alexandru ȘERBĂNOIU, PhD			
2.3 Seminar instructor				Professor Adrian - Alexandru ȘERBĂNOIU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	C	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar	1	3.3b laboratory		3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar	14	3.6b laboratory		3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	11
Additional research in the library, on specialised electronic platforms, and in the field	11
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	11
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per ssssssemester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	- Blackboard, video projector, specific teaching materials, etc. - Students will comply with the Code of Student Rights and Obligations and then Regulations provided for by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the seminar[13]	- Computing equipment, software packages, technical documentation of execution, technical details of execution, etc.; - The deadlines for submitting the papers are established by the lecturers in agreement with the students

6. General objective of the course

This discipline has the role of familiarizing students with the field of Management in construction. The various research areas and skills in the field of management will be presented. By going through this discipline, the students will understand the context of the financial, legislative, economic, technical act regarding the initiation of a construction work, the development, completion, and post-use of a construction investment. Particular emphasis will be placed on the area of bidding as well as on the preparation of technical and economic offers. Students will assimilate the necessary knowledge for the implementation of the project of organization of execution as well as for the project of organization of the construction site, the discipline that will be taught at the master studies.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - Manages budgets - Plans, monitors, and reports on the budget. - Drafts technical reports - Composes technical reports of customers on the understanding of people who do not have technical knowledge - Assures the management of the auction processes/public tendering processes - Organizes the process of drafting and designing the proposals or tenders - Ensures compliance with security legislation - Implements security programs in order to comply with national laws and legislation. Ensures that the equipment and processes comply with security regulations.
Skills	The student/ graduate: - Identifies the best method of programming the execution of the construction work in relation to the requirements imposed by a beneficiary; - Uses digital tools to offer/tender construction works; - Analyzes and compares different technical projects and explains how to structure technology and organization; - Selects and applies concepts, principles, and methods for performing the cost calculation of a work; - Informs about the legislation in the field
Responsibility and autonomy	The student/ graduate: - Respects ethical principles, norms, and values in the correct and timely execution of professional tasks, by addressing a rigorous, effective, and responsible work strategy in decision making for problem solving; - Integrates into the working group and applies networking and effective work techniques in multidisciplinary teams, on various hierarchical levels; - Informs and documents themselves permanently in their own field of activity through the appropriate use of effective lifelong learning methods and techniques; - Develops professional projects in the field of engineering

8. Teaching strategies

In the teaching activity, interactive lectures and debates will be used based on Power Point presentations that are made available to students through the Google platform. The presentations contain sketches, images, and films, so that the information is easily understood and assimilated. Each course will start with a brief review of the notions taken at the previous course.

The teaching method is based both on the classical method but also on action-based methods such as exercise, practical activities and problem solving.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Introduction to the Construction Management	Lecture, video projector, debates, explanations	2 hours
9.1.2. Investments; general concepts. Construction investments. Definition of the investments. Classification of investments. Definition of construction investments. Definition of the construction investments. The particularities of construction investments		1 hour
9.1.3. The stages of making an investment in construction. Definition of the stages of construction investment. Description and analysis of each of the stages of construction investment. The place and role of discipline within each of the listed stages		1 hour
9.1.4. Factors involved in the realization of an investment in construction. Definition of all factors involved in the realization of a construction investment. Description of the		1 hour

responsibilities of the actors involved in carrying out a construction investment. The legislative framework governing the activity of the factors involved in making an investment in construction		
9.1.5. Definition of the concepts of cost, expense, price. Price categories for construction. Definition of economic concepts of cost, expense, and price. The relationship among price, cost and expense when carrying out a construction work. Categories of construction prices; definition of price categories in construction; relationships between various price categories in construction	Lecture, video projector, debates, explanations	2 hours
9.1.6. The price structure of a construction work. Definition of the price structure of a construction work. Analysis of the constituent elements of the price structure of a construction work. The relationship between the different elements of the price of a construction work. The functional structure of a construction firm and its influence on the elements of the price of a construction work		1 hour
9.1.7. Methods of assessing the price of a construction work. The definition of methods for assessing the price of construction work. Description of the methods for assessing the price of a construction work. Comparative analysis of the different methods of assessing the price of a construction work		2 hours
9.1.8. Price evaluation of a construction work using the standard method. Consumption standard; definition. Structure of a consumption rule (estimate rule). Analysis of the structure of a consumption rule (estimate rules). Indicator of currency standards; content; structure. Analysis of the structure and content of an indicator of currency rules		2 hours
9.1.9. Quantitative estimation of a construction work using the standard assessment method. The steps for quantitative assessment of a construction work using the rules-based method. Drawing up specific economic documentation for the quantitative estimation of a building - Bill of quantity		2 hours
9.1.10. Estimation the resource consumption for the execution of a construction work using the rules-based assessment method. The steps for the estimation of resource consumption for the execution of a construction work using the rule-based assessment method. Drawing up specific economic documents for estimating the consumption of resources for construction work - extracts of resources		4 hours
9.1.11. Estimation the costs of carrying out a construction work. Definition of economic documentation for the calculation of the costs of execution of a construction work. The estimate by category of works. Drawing up the analytical estimate by category of work. Drawing up the summary estimate by category of works.		2 hours
9.1.12. Estimation of execution costs for carrying out a construction work. Definition of economic documents for the calculation of the costs of carrying out a construction work - summary of the estimate. Drawing up the "estimate report" documentation.		2 hours
9.1.13. General concepts of procedures for contracting the execution of construction works. Special features on public procurement. Procedures for contracting the execution of a construction work. Special features of public procurement procedures and their consistency with European public construction contract rules. The specific stages for contracting public construction works. The structure and content of tender documents in the case of tenders for the procurement for the execution of public works. Legislative provisions on the tendering of the execution of public construction works. Harmonization of Romanian and European legislation in the field		2 hours
9.1.14. Contracting of construction work. Types of construction contracts. The characteristics of FIDIC contracts in construction. Legislative provisions on the contracting of construction works. Harmonization of Romanian and European legislation in the field		2 hours
9.1.15. Acceptance of construction work. Procedures for the acceptance of construction work. Legislative provisions on the reception of construction works. Authorization to carry out construction work Authorization to carry out construction work; definition; necessity. Legislative provisions on the authorization to carry out construction works. The harmonization of the provisions of Romanian and European legislation on the authorization of construction works.		2 hours
9.2a Seminar	Work methods[16]	Observations, allotted time
9.2.1. Analysis of the construction project and determination of technological and organizational solutions for execution. Analysis of the drawing boards and execution details for the understanding of the project; establishment of possible technological and organizational variations for the execution of construction works; establishment of lists of categories of works	Case study, practical demonstration, experiment on using software programs	2 hours
9.2.2. Quantitative evaluation of the execution of construction works. Calculation of the quantities of work corresponding to each category of work; drawing up of the list		2 hours

9.2.3. Value assessment of the execution of construction works. Calculation of resource consumption; compile extracts of resources. Calculation of execution costs; drawing up of synthetic estimate by category of works. Calculation of execution costs; preparation of a summary of the estimate		4 hours
9.2.4. Drawing up economic documentation using software programs. available in the discipline laboratory. Presentation of software programs available in the discipline laboratory. Learning the use of software. Drawing up economic documentation for PTh or DDE projects received using the submitted software programs		4 hours
Reading list for the seminar: 1. Şerbanoiu, A. Serbanoiu V. Bogdan, Construction economics, Editura Societății Academice "Matei-Teiu Botez,Iasi ISBN 978-606-582-071-5, 2015 2. Şerbanoiu, A. A Cătălina Mihaela Grădinaru, Construction Cost Estimate-Practical Work Guide, Editura „Bioflux" Cluj-Napoca 2020, 215 pagini, ISBN 978-606-8887-92-0 3. http://www.editura.bioflux.com.ro/docs/CONSTRUCTION_COST_ESTIMATE.pdf		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Test	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- summative assessment test (final assessment)	100%	80%
10.5a Seminar	Participation in the seminar activity, the ability to document, the application of knowledge in the execution activity.	- completion of seminar activity - completion of seminar worksheets - assessment test		20%
10.6 Passing requirements Knowledge of methods of estimating the price of a construction work. Content of the technical side of a construction work. Content of specific regulations- Law 10/1995, Law 50/1991, etc. and the factors involved in the construction field.				
The result of the final evaluation of a discipline result from taking into account the scores and weightings assigned to each activity within the discipline. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits				

Date of completion: September 2025

Lecture instructor: Professor Adrian - Alexandru ŞERBĂNOIU, PhD

Seminar instructor: Professor Adrian - Alexandru ŞERBĂNOIU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Cătălin ONUȚU, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

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[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*

[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Dinamica construcțiilor** **Structural Dynamics**			
2.1.2. Course code				CE303			
2.2 Lecture instructor				Lecturer Ioana OLTEANU, PhD			
2.3 Seminar instructor				Lecturer Ioana OLTEANU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	4	3.2 lecture	2	3.3a seminar	2	3.3b laboratory		3.3c project		3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	56	3.5 lecture	28	3.6a seminar	28	3.6b laboratory		3.6c project		3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	20
Additional research in the library, on specialised electronic platforms, and in the field	10
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	14
Assessment[8]	3
Other activities:	

3.7 Total number of individual study hours[9]	44
3.8 Total number of hours per semester[10]	100
3.9 Number of ECTS credits	4

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	-
4.2 Learning outcomes prerequisites	CE116/ Strength of Materials 1; CE201/ Structural statics and stability 1; CE210/ Structural statics and stability 2

5. Requirements

5.1 for the lecture[12]	- Teaching activities are held at the faculty headquarters using: blackboard, whiteboards, video projector, specific teaching materials, etc. - Students will comply with the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the seminar[13]	- Applied activities are held at the faculty headquarters using: computing technology, software packages, experimental stands, etc.; - The deadlines for submitting the assignments are established for week 7 and 14; - Students need to pass a test with a minimum grade of 5

6. General objective of the course

The course aims to develop fundamental competencies related to the dynamic behaviour of structures under dynamic actions, by understanding the basic principles and methods of structural dynamic analysis. Students will acquire the ability to characterize dynamic actions (earthquake, vibrations, impact), to create simplified dynamic models, and to determine the structural response in both time and frequency domains. The course also aims to build the capacity to interpret dynamic analysis results and to assess the influence of key factors affecting structural behaviour, providing the necessary foundation for advanced courses in structural analysis and seismic design.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - explains the fundamental concepts of structural dynamics, including mass, stiffness, damping, natural frequency, and mode shapes; - describes the types of dynamic actions that may affect structures (earthquake, wind-induced vibrations, machine vibrations, impact); - identifies single-degree-of-freedom (SDOF) and multi-degree-of-freedom (MDOF) models and their assumptions; - understands the principles of free and forced vibration analysis in time and frequency domains; - explains the response spectrum concept and its relevance for seismic design; - recognizes factors influencing dynamic behaviour such as material properties, structural configuration, damping mechanisms, and boundary conditions.
Skills	The student/ graduate: - model simple structural systems using SDOF and basic MDOF representations; - solve free vibration problems to determine natural frequencies and mode shapes; - compute dynamic responses for harmonic, periodic, and impulsive loads using analytical methods; - interpret response spectra and apply them to estimate structural response under seismic action; - analyze the influence of mass, stiffness, and damping variations on dynamic behaviour; - apply dynamic analysis concepts to simplified real structural elements (beams, frames, typical building systems).
Responsibility and autonomy	The student/ graduate: - demonstrates responsibility in selecting adequate simplified models for dynamic analysis of structures; - evaluates critically the limitations of analytical models and approximations used in structural dynamics; - communicates clearly the steps and assumptions involved in solving dynamic problems; - works independently or in teams to complete dynamic analysis tasks and interpret results; - exercises professional judgement when assessing structural behaviour under dynamic actions; - recognizes the need for continued learning in advanced seismic design and structural analysis.

8. Teaching strategies

The teaching activities combine interactive lectures, guided problem-solving sessions, and applied demonstrations to support a solid understanding of the fundamental concepts of structural dynamics. Lectures introduce theoretical principles using visual aids, diagrams, simplified models, and real-world examples that illustrate dynamic behaviour. Learning is reinforced through problem-based approaches in which students work individually and in groups to solve vibration problems, interpret response spectra, and analyze simplified dynamic models. Demonstrations using computational tools or simplified numerical simulations are integrated to help students visualize structural response in both time and frequency domains. Regular short discussions and feedback sessions ensure that students can connect theory with practical applications and develop analytical reasoning. Collaborative work is encouraged to promote critical thinking and the ability to justify modelling choices and assumptions relevant to dynamic analysis.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Elements of Vibration Theory: Classification of vibratory motions. Classification of dynamic actions. Dynamic system. Dynamic model.	Interactive lecture, debates, explanations	4 hours
9.1.2. Vibrations of Linear Systems with 1 DOF: Free undamped vibrations of 1 DOF. Free damped vibrations of 1 DOF. Forced vibrations of 1 DOF.		8 hours

9.1.3. Vibrations of Linear Systems with n DOF: Free undamped vibrations of MDOF – stiffness matrix method. Free undamped vibrations of MDOF – flexibility matrix method. Harmonic forced vibrations of MDOF – stiffness matrix method. Harmonic forced vibrations of MDOF – flexibility matrix method. Modal analysis of dynamic response.	Interactive lecture, debates, explanations	10 hours
9.1.4. Numerical Methods for Evaluating Dynamic Response		2 hours
9.1.5. Control and Reduction of Dynamic Effects: Passive and active vibration control devices: dampers, seismic isolators, tuned mass dampers (TMD). Case studies on the application of vibration control systems to new and existing buildings.		4 hours
Reading list for the lecture: 1. Olteanu Ioana, suport de curs online, 2023 2. Movilă M., 2018, Dinamica construcțiilor, Ed. Societății Academice Matei-Teiu Botez 3. Atanasiu, G.M., Rosca, V.O., 2014, Advanced Structural Dynamics, Ed. Politehnium, Iasi, 4. Alessandro Dazio, 2013, Course "Fundamentals of Structural Dynamics", UME Graduate School, An-Najah National University 5. Chopra A. K., 2012, Dynamics of Structures – Theory and Applications to Earthquake Engineering, Edd. Pearson 6. Atanasiu, G.M., 2005, Structural Dynamics, 2nd Ed., Vasile Goldiș University Press, Arad 7. http://www.utexas.edu/its/rc/answers/math/matlab/manual, University of Texas at Austin, Computation Center, Matlab Manual Pages, 1996 8. http://www.tufts.edu/~rwhite07/Matlab.htm, White R., Matlab Tutorial, 2010		
9.2a Seminar	Work methods [17]	Observations, allotted time
9.2.1. Dynamic Response of a single degree of freedom model, SDOFM. Response of SDOFM in free and forced vibrations of structures modelled using Matlab for computation of eigenvalues and vectors and for graphical representation.	Explanatory review	10 hours
9.2.2. Dynamic Response of a multi- degree of freedom model, MDOFM. Response of MDOF Models in free and forced vibrations by flexibility and stiffness matrix method. Dynamic response for MDOFM, damped by modal analysis method.		14 hours
9.2.3. Presentation of homework and final evaluation of results		4 hours
Reading list for the seminar: 1. Olteanu Ioana, aplicații rezolvate online, 2023 2. Movilă M., 2018, Dinamica construcțiilor, Ed. Societății Academice Matei-Teiu Botez 3. Atanasiu, G.M., Leon, F., 2008, Structural Dynamics Applications Using Matlab, Ed. Tehnopress, Iasi, ISBN 973-702-477-XD, Iași 4. http://www.utexas.edu/its/rc/answers/math/matlab/manual, University of Texas at Austin, Computation Center, Matlab Manual Pages, 1996 5. http://www.tufts.edu/~rwhite07/Matlab.htm, White R., Matlab Tutorial, 2010		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- theoretical evaluation test (final verification).	50%	50%
		- application evaluation test (final verification).	50%	
10.5a Seminar	Ability to work in a team. Ability to apply acquired knowledge in practice in different contexts. Capacity for analysis, personal interpretation, originality, and creativity	- systematic observation of students (individual assignments)	50%	50%
		- formative assessment test (checks throughout the semester).	50%	
10.6 Passing requirements: - Obtaining a minimum grade of 5 on the final written exam (both theoretical and applied), which verifies essential knowledge of dynamics (dynamic characteristics, eigenmodes, spectral response). The student understands the basic principles of structural system dynamics (equation of motion, damping, dynamic response). - Promoting continuous assessment by reaching the minimum established score (minimum 5 on the test in week 6). - Fulfilling the seminar requirements: - Correctly models systems with one and more degrees of dynamic freedom.				

- Apply dynamic analysis methods and interpret structural response - The 2 homework assignments will be partially worked on during classes and students will be graded for this activity. The arithmetic average of the grades must be at least 5. The homework assignments must be completed in full and submitted on time (week 6, respectively 14).
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.

Date of completion: September 2025

Lecture instructor: Lecturer Ioana OLTEANU, PhD

Seminar instructors: Lecturer Ioana OLTEANU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGHIAC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

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[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Metode numerice in Inginerie Numerical Methods in Engineering**			
2.1.2. Course code				CE304			
2.2 Lecture instructor				Associate Professor Ionut - Ovidiu TOMA, PhD			
2.3 Laboratory instructor				Associate Professor Ionut - Ovidiu TOMA, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar		3.3b laboratory	1	3.3c project		3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar		3.6b laboratory	14	3.6c project		3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	15
Additional research in the library, on specialised electronic platforms, and in the field40	9
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios20	9
Assessment[820]	2
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	Not applicable
4.2 Learning outcomes prerequisites	Matrix and vector calculus

5. Requirements

5.1 for the lecture[12]	- Blackboard, video projector, teaching materials in electronic format; - Students will comply with the Code of Student Rights and Obligations and the regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iasi
5.2 for the laboratory[13]	- Blackboard, video projector, computer / laptop, specific software; - Assignment deadlines will be clearly specified

6. General objective of the course

Students will develop theoretical understanding and computational proficiency in the fundamental principles of the finite element method (FEM). This includes structural modelling and domain discretization, selection and analysis

of appropriate finite element types, system assembly, solution of governing equations for nodal unknowns and calculation of additional analysis variables as required.

They will be able to recognize the defining characteristics of various finite element types used in structural and process modelling, including element geometry, nodal arrangements, degrees of freedom, interpolation functions, and stiffness matrices in both local and global reference systems.

Identification and assessment of key input parameters for finite element analysis, such as structural topology, nodal degrees of freedom, finite element selection, material properties, boundary conditions and applied loads will be mastered by the end of this lecture.

Upon completion, students will be able to apply suitable numerical methods - particularly the finite element method - and associated computational software to solve for nodal values of unknown variables and derive additional results as required.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - Identifies the state of loading and writes the force-displacement equilibrium equation in matrix formation for the finite element; - Evaluates the elements of the stiffness matrix; - Identifies the appropriate matrix expansion method
Skills	The student/ graduate: - Uses the appropriate matrix expansion procedure to write the stiffness matrix in global coordinates; - Selects the and applies the rearrangement of the force-displacement equilibrium equation, in matrix formation, expressed in the global coordinate system to solve for the system unknowns; - Applies the substructuring procedure of the system of equations to quickly obtain the solution in terms of nodal displacements and notal forces.
Responsibility and autonomy	The student/ graduate: - complies with ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; - integrates into workgroups and applies effective relationship-building and teamwork techniques in multidisciplinary teams across different hierarchical levels; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques.

8. Teaching strategies

The teaching activities will combine participatory lectures and debates supported by PowerPoint presentations made available to students, together with demonstrations carried out on the traditional blackboard. Through this format, students actively participate in the step-by-step derivation of calculation formulas, which supports active learning grounded in mathematical logic. The presentations include images and sketches to make the material easier to understand and assimilate, and each class session will begin with a brief review of the concepts covered previously. The instructional approach also incorporates discovery learning, enabled by direct and indirect exploration of real phenomena (demonstrations), as well as action-oriented methods such as exercises, practical activities and problem-solving tasks.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. **Introduction in the Finite Element Method (FEM):** Basic concepts in FEM.; Modelling principles.	Interactive lecture, debates, explanations	4 hours
9.1.2. **Finite Element Analysis of Linear Structural Elements or Structures Made of Linear Elements:** Analysis of axially loaded structural elements; Analysis of two-dimensional and three-dimensional truss structures. Analysis of beams; Analysis of two-dimensional and three-dimensional frames.		8 hours
9.1.3. **Finite Element Analysis of Two-Dimensional Structural Elements which Work in Plane Stress or Strain:** triangular and rectangular finite elements in cartesian and natural coordinates; Axisymmetric finite elements; Assembly procedure.		8 hours

9.1.4. **Finite Element Analysis of Three-Dimensional Structural Elements:** Tetrahedral finite element in cartesian and natural coordinates; Brick-shape finite element in cartesian and natural coordinates; Assembly procedure	Interactive lecture, debates, explanations	6 hours
9.1.5. **Finite Element Analysis of Thin Plates:** Analysis of thin plates by using rectangular and triangular finite elements		2 hours
Reading list for the lecture: 1. Seshu P., (2017), Textbook of Finite Element Analysis, Eastern Economy Edition, (free access) 2. Bathe K-J, (2016), Finite Element Procedures, second edition, Prentice Hall, Pearson Education USA, (free access) 3. Vrabie M., Băetu S.A., (2014), Metoda elementelor finite. Aplicații în mecanica structurilor. Vol.I, Editura Societății Academice "Matei-Teiu Botez" 4. Ibănescu M., Diaconu-Şotropa D. (2013), Basic Concepts in Computer Aided Design - Finite Element Method, Ed. Performantica, Iași,ISBN 978-605-685-082-7 5. Modlen G., (2010), Introduction to Finite Element Analysis, University of Manchester, (free access) 6. Panţel E., Bia C., (2009), Metoda elementelor finite pentru structuri de rezistenţă, Ed. Todesco, Cluj-Napoca, 2009 7. Atanasiu Gabriela, Vlad Ioana, Brătianu C., (2005), Finite Elements in Structural Analysis, Ed. Cermi, Iaşi 8. Reddy J.N., (2005), An introduction to the Finite Element Method, Mc Graw Hill Series 9. Hutton D.V., (2004), Fundamentals of Finite Element Analysis, McGraw-Hill 10. Chandrupatla T. R., Belegundu A. D., (2002), Introduction to Finite Elements in Engineering, Prentice - Hall Pearson Educational International, Third Edition		
9.2b Laboratory	Work methods[16]	Observations, allotted time
9.2b.1. **Finite Element Analysis of Axially Loaded Members:** Analysis of a stepped member by using MathCAD. Checking method: FEM1D.	Individual assignments, Explanations	3 hours
9.2b.2. **Finite Element Analysis of a Two-Dimensional Truss Structure:** Analysis of a truss structure by using MathCAD. Checking method: TRUSS or ROD 2D		3 hours
9.2b.3. **Finite Element Analysis of a Beam:** Analysis of a stepped beam subjected to combined bending and shear by using MathCAD. Checking method: BEAM or BEAM 2D		2 hours
9.2b.4. **Finite Element Analysis of a Two-Dimensional Frame:** Analysis of a frame by using MathCAD. Checking methods: FRAME		3 hours
9.2b.5. **Finite Element Analysis of a Deep Beam:** Analysis of a deep beam by using MathCAD. Checking method: FE2CST		3 hours
Reading list for the laboratory: 1. Seshu P., (2017), Textbook of Finite Element Analysis, Eastern Economy Edition, (free access) 2. Bathe K-J, (2016), Finite Element Procedures, second edition, Prentice Hall, Pearson Education USA, (free access) 3. Vrabie M., Băetu S.A., (2014), Metoda elementelor finite. Aplicații în mecanica structurilor. Vol. I, Editura Societății Academice "Matei-Teiu Botez" 4. Ibănescu M., Diaconu-Şotropa D. (2013), Basic Concepts in Computer Aided Design - Finite Element Method, Ed. Performantica, Iași,ISBN 978-605-685-082-7 5. Modlen G., (2010), Introduction to Finite Element Analysis, University of Manchester, (free access) 6. Reddy J.N., (2005), An introduction to the Finite Element Method, Mc Graw Hill Series 7. Hutton D.V., (2004), Fundamentals of Finite Element Analysis, McGraw-Hill 8. Chandrupatla T. R., Belegundu A. D., (2002), Introduction to Finite Elements in Engineering, Prentice - Hall Pearson Educational International, Third Edition		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	- systematic observation of students (individual assignments – which must be completed during the week between lectures)	40%	90%
		- summative assessment test (final assessment)	60% (min. 5)	
10.5b Laboratory	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities		10%

10.6 Passing requirements Recognition of the form of the stiffness matrices of the element depending on the stress state. Process of assembling the stiffness matrices of the finite elements to obtain the structural stiffness matrix. Form of the geometric stiffness matrix. The equilibrium equation in matrix form.
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.

Date of completion: September 2025

Lecture instructor: Associate Professor Ionut - Ovidiu TOMA, PhD

Laboratory instructors: Associate Professor Ionut - Ovidiu TOMA, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGHIAC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

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[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Beton armat și precomprimat 2** **Reinforced and Prestressed Concrete 2**			
2.1.2. Course code				CE305			
2.2 Lecture instructor				Lecturer Bogdan - Gheorghe ROȘCA, PhD			
2.3 Project instructor				Lecturer Bogdan - Gheorghe ROȘCA, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	4	3.2 lecture	2	3.3a seminar		3.3b laboratory		3.3c project	2	3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	56	3.5 lecture	28	3.6a seminar		3.6b laboratory		3.6c project	28	3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	28
Additional research in the library, on specialised electronic platforms, and in the field	24
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	15
Assessment[8]	14
Other activities:	2

3.7 Total number of individual study hours[9]	69
3.8 Total number of hours per semester[10]	125
3.9 Number of ECTS credits	5

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	CE212/ Reinforced and Prestressed Concrete 1
4.2 Learning outcomes prerequisites	Basic in Strength of Materials, Statics

5. Requirements

5.1 for the lecture[12]	Table handwriting, video-projector
5.2 for the project[13]	Table handwriting, video-projector

6. General objective of the course

This course aims with presenting elements of structural design of reinforced concrete elements as well as basic notions regarding the obtaining and detailing of prestressed concrete elements. The elements of structural design are necessary both for the realization and for the understanding of the structural projects of reinforced concrete constructions that must be drawn up in compliance with the design rules that are indicated by the European standards (Eurocodes) as well as by the national codes.

7. Learning outcomes[14]

Knowledge	The student/ graduate along the spent time: - identifies, evaluates, and explains the different categories of elements in reinforced concrete structures; - learn how to apply the calculation methods used in the design of reinforced concrete elements; - learn about the most common design cases for common stresses on reinforced concrete elements, bending, shear force, axial force with bending; - solves examples of the design of sections required for common efforts encountered in current practice; - becomes aware of the design regulations introduced by European standards and national design codes; - conceives and designs structural elements that make up a reinforced concrete construction (slabs, beams, pillars); - details structural elements that make up a reinforced concrete construction (slabs, beams, pillars) by drawing up structural plans;
Skills	The student/ graduate along the spent time: - develops the understanding of how loads are transmitted between elements in reinforced concrete constructions; - prepares dimensioning and verification calculations of the sections of reinforced concrete elements; - elaborates reinforcement sketches of the designed elements regarding the reinforcement along the element as well as on the section; - critically evaluates the reinforcements made from the point of view of material and labour economy; - uses digital tools for certain static calculations as well as for drafting structure plans;
Responsibility and autonomy	The student/ graduate: - respects the principles, norms and values of ethics in the correct execution and on time of the tasks established by the design theme; - approaches a rigorous, efficient, and responsible work strategy in making decisions to solve the design theme; - integrates into the work group and applies effective communication and teamwork techniques; - is informed and documented in the field of activity of the discipline through the appropriate use of effective learning methods and techniques; - is concerned with developing projects for reinforced concrete structures in the most professional manner possible

8. Teaching strategies

Participatory lectures and debates will be used in the teaching activity based on slide presentations that will be made available to the students accompanied by the explanation of certain concepts through writing demonstrations on the blackboard. The presentations contain images and sketches so that the information is easy to understand and assimilate. Each course will begin with a brief review of the concepts covered in the previous course.

The teaching method also includes solving certain calculation problems based on the theoretical support presented on the slides.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. **Presentation of the general construction method of design Limit States Method** with the applicable variants, limit states to concrete civil structures	Interactive lecture, debates, explanations	2 hours
9.1.2. The design diagrams regarding concrete and reinforcement provided by Eurocode 2, the behaviour stages in flexure of the reinforced concrete members		2 hours
9.1.3. Design of structural elements at Ultimate Limit State (ULS). Bending (Singly Reinforced Rectangular Section, Applications)		2 hours
9.1.4. Design of structural elements at Ultimate Limit State (ULS). Bending (Flanged section, Applications)		2 hours
9.1.5. Design of structural elements at Ultimate Limit State (ULS). Bending (Doubly Reinforced Rectangular Section, Applications)		2 hours
9.1.6. Design of structural elements at SLU. SHEAR FORCE. Shear force resistance mechanism of concrete elements with/without shear force reinforcement. Shear force design of elements requiring shear reinforcement based on the truss beam model.		2 hours
9.1.7. Design of structural elements at SLU. SHEAR FORCE. Particular cases of design for shear force. Case of loads applied near the support. Shear between the web and the slab at the T-section. Shear at the interface between concrete of different ages.		2 hours

9.1.8. Design of structural elements at SLU. Combined action of axial force N and moment M. Condition for the second order analysis of elements in compression. Design of structural elements at axial force N and moment M (simplified equilibrium equations at eccentric compression). Applications.	Interactive lecture, debates, explanations	2 hours
9.1.9. Design of structural elements at SLU. Interaction diagram on reinforced concrete section between axial force N and moment M to eccentric compression. Design of elements to oblique eccentric compression. Applications		2 hours
9.1.10. Cracking limit state. Cracking control. Crack opening calculation. Crack spacing. Cracking limitation by direct calculation. Element deflection limitation.		2 hours
9.1.11. **Prestressed concrete:** Basic concepts of prestressed concrete, Benefits and disadvantages of prestressed concrete, State of stress on the cross section, Methods of obtaining prestressed concrete elements.		2 hours
9.1.12. **Prestressed concrete:** Materials for prestressed concrete, Requirements for concrete and prestressing steel. Prestressing systems and end anchorages. Injection of channels in prestressed beams		2 hours
9.1.13. **Prestressed concrete:** Loses of prestress		2 hours
9.1.14. **Prestressed concrete:** Basic design principles to bending		2 hours
Reading list for the lecture: 1. B. Roșca, Lecture notes. https://edu.tuiasi.ro/course/view.php?id=2034 2. L.H. Martin, J.A. Purkiss „Concrete Design to EN 1992", Ed. Butterworth-Heinemann, London, 2006. 3. „Manual for the design of concrete building structures to Eurocode 2", Institution of Structural Engineers, London, 2006, ISBN 0 901-297-42-9 4. P. Bhatt, T.J. MacGinley and B.S. Choo „Reinforced Concrete Design to Eurocodes, Design Theory and Examples", fourth ed., Ed. CRC PRESS, Taylor & Francis Group, 2014, 978-1-4665-5253-1 (eBook – PDF)		
9.2c Project	Work methods [18]	Observations, allotted time
Stage 1: Project topic – Structural data. Durability requirements (strength class of concrete and concrete cover and reinforcing steel) according to EN 1992-1-1 (EC2).	Design general case – background of the stages 1 - 13	2 hours
Stage 2: Design of the floor above the ground floor - Layout of the beams in plan. Preliminary sizing of the structural elements (slab, secondary beam, main beam, flange, column). Design of the slab as a one-way spanning slab (supports, loads, static calculation in the plastic domain)		2 hours
Stage 3: Design of the floor above the ground floor (continued) – Design of the longitudinal reinforcement. Reinforcement provisions for slabs in the main and secondary directions. Reinforcement plan (reinforcement examples)		2 hours
Stage 4. Design of the floor above the ground floor (continued). Presentation of the formwork and reinforcement plan for the floor slab. Discussions		2 hours
Stage 5: Secondary beam design. Supports, loads and static analysis in the elastic domain. Discussions		2 hours
Stage 6: Secondary beam design (continued). Longitudinal reinforcement design. Beam reinforcement provisions. Longitudinal beam reinforcement plan. Discussions		2 hours
Stage 7: Secondary beam design (continued). Transverse reinforcement design. Presentation of the second reinforcement plan entitled the formwork and reinforcement plan for the 1st floor beam. Discussions		2 hours
Stage 8: Design of the floor above the floor – Layout of the floor beams. Pre-dimensioning of the structural elements (slab, secondary beam). Design of the slab as a two-way slab (supports, loads, static calculation in the elastic domain) Discussions		2 hours
Stage 9: Design of the floor above the floor (continued) - Design of longitudinal reinforcement in both directions – reinforcement with independent bars. Reinforcement provisions for slabs. Reinforcement plan (example). Presentation of the third reinforcement plan entitled Formwork and reinforcement plan of the floor above the floor. Discussions		2 hours
Stage 10: Design of the floor above the floor (continued) - Design of longitudinal reinforcement in both directions – welded mesh reinforcement. Provisions for welded mesh reinforcement for slabs (overlaps and welded mesh anchorage). Mesh selection and reinforcement plan (example). Presentation of the welded mesh reinforcement plan. Discussions		2 hours
Stage 11: Design of the transverse frame elements. Loads and load cases. Structural analysis in the elastic domain. Design of the longitudinal reinforcement of the beams at level 1. Discussions		2 hours
Step 12: Design of transverse frame elements (continued). Design of frame beam shear reinforcement. Detailing of frame beam reinforcement. Discussions		2 hours
Step 13: Design of the transverse frame elements (continued). Presentation of the reinforcement plan for the frame beams. Discussions		2 hours

Stage 14: Checking and grading the project	Questions and answers	2 hours
Reading list for the project: 1. B. Roșca – Design example (pdf file) 2. 2. EN 1992-1-1 Design of the concrete structures. General rules and rules for buildings 3. „Manual for the design of concrete building structures to Eurocode 2", Institution of Structural Engineers, London, 2006, ISBN 0 901-297-42-9 4. P. Bhatt, T.J. MacGinley and B.S. Choo „Reinforced Concrete Design to Eurocodes, Design Theory and Examples", fourth ed., Ed. CRC PRESS, Taylor & Francis Group, 2014, 978-1-4665-5253-1 (eBook – PDF)		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam/	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	- summative assessment test (final assessment)	**Test 1** Solving of 2 applications (one solved app. = score 5) **Test 2** Pick up a card - Presenting a subject of theory by writing.	50% (≥ 5)
10.5c Project	Participation in project activities, ability to conduct research/ documentation, and application of knowledge in project work	- project work - project completion - project viva		50% (≥ 5)
10.6 Passing requirements The exam can be met if the project has been submitted and graded. Minimum knowledge of the calculation and detailing of reinforced concrete elements; Minimum knowledge of reading and understanding reinforcement plans for slabs, beams, columns Minimum knowledge of the techniques for making prestressed concrete elements				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Bogdan - Gheorghe ROȘCA, PhD

Seminar instructor: Lecturer Bogdan - Gheorghe ROȘCA, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Cătălin ONUȚU, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*

[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Geotehnică** **Geotechnics**			
2.1.2. Course code				CE306			
2.2 Lecture instructor				Lecturer Mircea ANICULĂESI, PhD			
2.3 Laboratory instructor				Lecturer Mircea ANICULĂESI, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time

3.1 Number of hours per week	5	3.2 lecture	3	3.3a seminar		3.3b laboratory	2	3.3c project		3.3.d practical sessions
3.4 Total number of hours in the curriculum[6]	70	3.5 lecture	42	3.6a seminar		3.6b laboratory	28	3.6c project		3.6.d

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	20
Additional research in the library, on specialised electronic platforms, and in the field	20
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	15
Assessment[8]	6
Other activities:	

3.7 Total number of individual study hours[9]	55
3.8 Total number of hours per semester[10]	125
3.9 Number of ECTS credits	5

4. Prerequisites

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	Strength of Materials 1, Engineering Geology

5. Requirements

5.1 for the lecture[12]	- On-site: Whiteboard and video projector, desktop/ laptop for numerical simulations - On-line: TUIASI's Google Meet platform, desktop/ laptop for presentations and numerical simulations, graphic tablet for annotations
5.2 for the laboratory[13]	- On-site: Whiteboard and geotechnical laboratory equipment - On-line: TUIASI's Google Meet platform, desktop/laptop for presentations and numerical simulations, graphic tablet for annotations

6. General objective of the course

The general objective of the Geotechnics course is to introduce the fundamental principles of soil mechanics, to explain how to identify and characterize the soil layers from a site, to understand the necessary laboratory tests for determining mechanical

characteristics, and to apply this knowledge to analyse common problems in geotechnical and civil engineering, such as soil foundation bearing capacity, slope stability and retaining structures. Lectures cover topics such as the identification and characterization of soil behaviour, stress-strain behaviour, and the geotechnical design of structures that interact with the ground.

7. Learning outcomes[14]

Knowledge	The student/ graduate: – Defines and calculate the structure indices (porosity, void ratio, moisture content, etc.); – Explain the interaction between the soil three phases (solid, liquid, gaseous) and its importance; – Evaluate by calculation the stress state in soil masses; – Define the physical and mechanical properties of soils; – Understand and explain the properties of soil such as: permeability, deformability, plasticity; – Explain the failure mode of soil masses; – Evaluate by calculation the earth pressure on retaining structures; – Define the bearing capacity of the foundation ground and determine its value based on the soil characteristics
Skills	The student/ graduate: – Accurately define and calculate fundamental structure indices (e.g., porosity, void ratio, moisture content, unit weight); – Evaluate the stress state (effective and total) within soil masses using analytical methods, calculate the earth pressure (active and passive) exerted by soil on retaining structures and the soil bearing capacity; – Apply formulas, nomograms, and tables to solve simple, but fundamental, geotechnical engineering problems; – Recognize the necessary types of laboratory tests required to solve specific geotechnical design problems; – Interpret the results of laboratory tests to characterize and classify soils according to relevant national/ international standards and regulations
Responsibility and autonomy	The student/ graduate: – complies with ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; – integrates into workgroups and applies effective relationship-building and teamwork techniques in multidisciplinary teams across different hierarchical levels; – continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; – develops professional projects in the field of engineering.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students and relevant case studies. The presentations contain images and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

During the laboratory sessions, the teaching methods combine a demonstrative component with a practical one, including laboratory experiments on specific equipment, followed by data processing and interpretation. Both the activities in the lecture and laboratory are complemented by interactive discussions to clarify concepts and ensure an in-depth understanding of the material.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Soil characterisation and composition: Elements of stratigraphy, stratigraphic anomalies, structure and texture of soils, classification of soils, structure geotechnical indices, interaction solid -liquid - gas phases, surface tension, capillary height, water suction, plasticity, and consistency of clayey soils	Interactive lecture, debates, explanations	12 hours
9.1.2. Hydrological and hydraulic underground notions: The study of groundwater, Darcy's law, critical hydraulic gradient		3 hours
9.1.3. Stresses state in earth massive: In situ soil stress, Stress due to concentrated and uniformly distributed external loads		3 hours

9.1.4. Soils compressibility: Laboratory compressibility study, qualitative and quantitative aspects, compression – settlement curve, pre-consolidation pressure		3 hours
9.1.5. Soil settlement: Definition, specific terms, settlement calculation methods by Elasticity Theory and sublayer summation method	Interactive lecture, debates, explanations	3 hours
9.1.6. Soil shear strength: Definition, shear strength of the direct shear testing, unconfined and triaxial compression		4 hours
9.1.7. Stability of embankments and slopes: Definitions, landslides cause, classifications, methods for calculating the safety factor to sliding: Stability finite slope with linear failure plane (single and multi-plane), Fellenius method, Bishop		4 hours
9.1.8. Active and passive pressure of soils: Definitions, active and passive pressure calculation using Coulomb and Rankine theories		4 hours
9.1.9. Bearing capacity of soil: Definition of limit states, conventional pressures, plastic, and critical pressure calculation		6 hours
Reading list for the lecture: 1. Verruijt A. [2012], SOIL MECHANICS. Delft University of Technology (available online at: https://geo.verruijt.net/) 2. Craig R.F., [2004], Craig's Soil Mechanics, Spoon press (available online at: https://wp.kntu.ac.ir/fz_kalantary/Source/Soil%20Mech%20I/Craig%27s%20Soil%20Mechanics.pdf) 3. Murthy V. N. S. [2002], Geotechnical Engineering: Principles and Practices of Soil Mechanics and Foundation Engineering, CRC Press (available online at: https://venkatasai.wordpress.com/wp-content/uploads/2016/03/geotechnical-engineering-principles-and-practices-of-soil-mechanics-and-foundation-engineering-vns-murthy.pdf) 4. Stanciu A., Lungu I., Teodoru B.I., Aniculăesi M., [2014], Geotehnică – Note de curs, Editura Politehnium Iași 5. Stanciu A., Lungu I., [2006], Fundaţii I – Fizica şi mecanica pământurilor, Editura Tehnică, Bucureşti 6. Mușat V., [2003] – Geotehnică, Editura Gh. Asachi, Iasi 6. Roman F., [2011] – Inginerie geotehnică, Editura Papyrus Print, Cluj-Napoca		
9.2b Laboratory	Work methods [17]	Observations, allotted time
Laboratory 1. Laboratory safety guidelines; Soil sampling methods	Debates, explanations	2 hours
Laboratory 2. Grain size analysis: Sieve method	Experiment, explanations	2 hours
Laboratory 3. Grain size analysis: Hydrometer method		2 hours
Laboratory 4. Natural moisture content; Soil density (bulk unit weight): Oven drying method; Water displacement method and cylindrical ring method		2 hours
Laboratory 5. Soil plasticity (Atterberg limits): Liquid limit (wL) – Casagrande method; Plastic limit (wp) – Cylinders method; Plasticity index, consistency index, and shrinkage limit evaluation		2 hours
Laboratory 6. Soil relative density: Minimum density for sands; Maximum density for sands; Relative density or density index; Tamping capacity		2 hours
Laboratory 7. Permeability (hydraulic conductivity) test. Falling head test; Constant head test; Darcy's law; Coefficient of permeability		2 hours
Laboratory 8. Evaluation of soil compaction characteristics using the Proctor test		2 hours
Laboratory 9. Soil compressibility test. Oedometer test; Stress strain curve. Stress-void ratio curve. Oedometer modulus;		2 hours
Laboratory 10. Soil consolidation test. Coefficient of compressibility; Coefficient of volume compressibility. Coefficient of consolidation		2 hours
Laboratory 11. The soil shear tests. Direct shear tests		2 hours
Laboratory 12. The soil shear tests. Unconfined compressive tests (UCS). Unconfined compression strength of soils		2 hours
Laboratory 13. Engineering form report laboratory data log for soil investigation.	Explanations	2 hours
Laboratory 14. Laboratory data evaluation: internal friction angle and cohesion	Explanations	2 hours
Reading list for the laboratory: 1. Das B.M. [2002], Soil mechanics laboratory manual, New York Oxford OXFORD UNIVERSITY PRESS, (available online at: https://istasazeh-co.com/wp-content/uploads/2023/10/Soil-Mechanics-Laboratory-Manual-Braja-M.-Das-Z-Library.pdf) 2. Almadhoun Y.M.S., Soil Mechanics Laboratory Manual, (available online at: https://lib.zu.edu.pk/ebookdata/Engineering/Civil%20Engineering%20Technology/Soil%20Mechanics%20Laboratory%20Manual%20(%20PDFDrive%20).pdf) 3. Lungu I., Stanciu A., Aniculăesi M., Teodoru I.-B., [2013], Geotehnică. Lucrări de laborator, Editura Politehnium, Iași 4. Manea S., Batali L., Popa H., [2003], Mecanica pământurilor – Elemente de teorie. Încercări de laborator. Exerciții, Conspress, București		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	- summative assessment test (final assessment) Phase one (maximum grade 7): • Problem solving • Quiz. Phase two (for students that pass phase one and wont maximum grade 10): • Written exam – individual questions with one theoretical topic which are presented orally at the blackboard (condition – a grade of 6.5 on the phase one).	100%	60%
10.5b Laboratory	Ability to work in a team. Ability to apply acquired knowledge in practice in different contexts. Capacity for analysis, personal interpretation, originality, and creativity	- completion of laboratory worksheets (all laboratory sessions must be completed, with only three missed sessions allowed to be retaken) - assessment test (laboratory colloquium)		40%
10.6 Passing requirements The final exam is the part focused on problem-solving and synthesis of knowledge. The student needs to demonstrate the ability to solve simple problems in key areas like: Bearing Capacity, Earth Pressure, Slope Stability, calculating immediate and consolidation settlement, calculate the stress in the soil due to geological weight and by different types of external loadings and calculate the derivate geotechnical indexes. The theoretical knowledge will be analysed based on quiz and short-answer questions demonstrating a deep understanding of core principles of geotechnical engineering. For the laboratory, the student needs to know how to interpret the laboratory results, properly identify the testing machines from laboratory and know what parameters can be obtained using that particular testing machine.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Mircea ANICULĂESI, PhD

Laboratory instructor: Lecturer Mircea ANICULĂESI, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Oana - Elena COLȚ, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-*

studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).

[15] *Chapter and paragraph titles.*

[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*

[17] *Practical demonstration, exercise, experiment.*

[18] *Case study, demonstration, exercise, error analysis, etc*.

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Construcții civile** **Civil Constructions**			
2.1.2. Course code				CE307			
2.2 Lecture instructor				Associate Professor Radu - Aurel PESCARU, PhD			
2.3 Project instructor				Lecturer Ruxandra COZMANCIUC, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	4	3.2 lecture	2	3.3a seminar		3.3b laboratory		3.3c project	2	3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	56	3.5 lecture	28	3.6a seminar		3.6b laboratory		3.6c project	28	3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	28
Additional research in the library, on specialised electronic platforms, and in the field	15
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	26
Assessment[8]	3
Other activities:	

3.7 Total number of individual study hours[9]	69
3.8 Total number of hours per semester[10]	125
3.9 Number of ECTS credits	5

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	Physics, mathematics

5. Requirements

5.1 for the lecture[12]	- Video projector, blackboard, documentary films, - Online: TUIASI's (http//edu.tuiasi.ro) or Google meet platform - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the seminar / laboratory / project[13]	- Computing technology, software packages, experimental stands, - The deadlines for submitting the papers are established by the lecturer in agreement with the students

6. General objective of the course

The course "Civil Constructions" aims to develop fundamental competencies related to the design, composition, and analysis of the structural and constructive elements of civil buildings. Through studying this discipline, students acquire both theoretical and practical knowledge regarding the infrastructure, superstructure, and finishing works of

buildings, in accordance with the performance requirements established by current technical regulations. The course focuses on developing the ability to understand the constructive and structural behaviour of buildings as a whole, to identify the relationships among their component elements, and to apply architectural-structural design principles in civil construction projects. In addition, the discipline fosters a responsible attitude toward construction quality, operational safety, energy efficiency, and the sustainability of the built environment.

7. Learning outcomes [14]

Knowledge	The student / graduate: - Defines the main constructive elements of a civil building: infrastructure, superstructure, and finishing elements; - Explains the factors that determine the choice of the foundation system and the type of building structure; - Describes the types of foundations and the general principles of their design and execution; - Recognizes the types of structural and non-structural walls and their behaviour under applied loads; - Identifies the types of floor slabs, staircases, and roofs, and their role within the constructive system; - Explains the performance requirements for construction elements (strength, stability, fire behaviour, thermal and acoustic insulation); - Distinguishes between traditional and modern finishing types, the materials used, and the execution technologies; - Describes the basic concepts of building structures: massive structures, skeletal structures, and surface structures; - Understands the preliminary sizing methods for reinforced concrete structural elements, both cast-in-place and prefabricated; - Explains the principles of vertical and horizontal load distribution within structural elements
Skills	The student/ graduate: - Applies structural configuration principles in developing the constructive concept of a civil building; - Prepares structural plans for the infrastructure and superstructure, including execution details; - Evaluates types of actions (permanent, variable, accidental) and combines their effects in structural analysis; - Calculates the sectional characteristics of structural walls, diaphragms, and floor slabs; - Estimates the stiffness of structural walls and the equivalent moment of inertia; - Verifies strength conditions for structural walls and coupling beams under eccentric compression and shear; - Develops reinforcement details for the main structural elements; - Uses current technical standards and regulations in the design of civil structures; - Drafts technical projects in accordance with structural, functional, and aesthetic performance requirements; - Analyses construction solutions in terms of durability, sustainability, and behaviour under seismic actions
Responsibility and autonomy	The student/ graduate: - Evaluates the quality of constructive and structural solutions from the perspective of safety and performance in use; - Integrates requirements of strength, stability, and comfort into the structural concept of the building; - Collaborates within interdisciplinary teams for the development of civil construction projects; - Demonstrates responsibility in selecting materials and technologies according to the technical and economic context; - Complies with quality, environmental, and safety regulations in construction; - Demonstrates critical analysis skills and professional autonomy in solving design problems; - Assumes responsibility for the accuracy of proposed technical solutions and for complying with design standards; - Adapts to modern technological requirements and to the evolution of regulations in the field of civil construction.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (experiments, demonstrations, numerical modelling), as well as action-based methods, such as exercises, case study, problem-solving.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Building elements: 1.1 Main factors which determine the choice of the building foundations system. How to choose the zero (ground) laval of the building; 1.2 Building basements; 1.3 Damp proof courses (hydro-insulation) for foundations & underground floors; 1.4 Waterproofing against water with and without hydrostatic pressure.	Interactive lecture, debates, discuses - explanations on case study	4 hours
9.1.2. Walls: 2.1 Timber Walls; 2.2 Structural masonry walls of stone,brick, ceramic or b.c.a blocks; 2.3 Load bearing walls of monolithic and prefabricated reinforced concrete; 2.4 Structural and non-structural external walls; 2.5 Partition walls; 2.6 Light weight walls. Curtain walling; 2.7 Constructive elements to the walls: global deformation response joints, voids, chimneys, ventilation channels; 2.8 Fire protection. Hygrothermal behavior.		7 hours
9.1.3. Floors: 3.1. Performance requirements. Conception; 3.2 Wood, steel, monolithic and prefabricated reinforced concrete and ceramic elements floors; 3.3 Mechanical behavior under the vertical and horizontal loads action. Fire protection of the floors, impact noise protection		4 hours
9.1.4. Stairs: 4.1 Components. Functional design. Classification / types of stairs; 4.2 Wooden , stone , reiforced concrete, metal stairs; 4.3 Structural forms of stairs. Stairs made of linear elements. Stairs from the surface elements. Mixed structure stairs of linear and surface elements. Ortopoligonale stairs		4 hours
9.1.5. Roofs: Functional requirements; 5.1 Pitched roofs with plane surfaces. Classification. structure, constructive details. Hygrothermal Behavior; 5.2 Terrace roof. Conception. Hygrothermal Behavior. Sustainability; 5.3 Structural details for non-ventilated terrace roof, ventilated terrace roof, duo terrace roof, reversed terrace, garden terrace, circulated and uncirculated terrace roof.		3 hours
9.1.6. Finishes: Traditional & modern plastering. Functional suspended ceilings: (sound-absorbent, fire insulating and for masking the installations). Classification. Requirements. Composition, details. Durability. Technologies.		1 hours
9.1.7. Flooring: Classification. Requirements. Composition, details. Durability. Technologies.		1 hours
9.1.8. Roof Coverings: Classification. Requirements. Composition, details. Durability. Technologies.		1 hours
9.1.9. Building structures: Structural concept: solid structures, skeletal structures and surface structures		3 hours
Reading list for the lecture: 1. R.A. Pescaru - Civil Constructions 2 – Lectures/ Note curs pe suport web și printat (https://edu.tuiasi.ro/ course/view.php?id=3729#section-1), 2025 2. R.A. Pescaru - Civil Constructions * Building Elements, Ed. Soc. Acad. "Matei-Teiu Botez"- Iași, ISBN 973-7962-62-1, 2005 3. J. S. Foster, R. Harington – Struct. and fabric, Essex Longman 2007, 1996 4. J. Ochsendorf - Basic Structural Design, MIT Course, 2009, https://ocw.mit.edu/courses/architecture/4-440-basic-structural-design-spring-2009 5. Building Struct. Systems, https://edukite.org/course/building-structural-systems, 2021		
9.2c Project **Design of a civil building (UG+G +4 Fl ... UG+G +8 Fl) with semi-rigid structure (shear walls + lamellar frames) of monolith or prefab reinforced concrete**	Work methods[16]	Observations, allotted time
I. Structural conception (design) of the building. The current floor Plan, , Constructive details (walls, floors, basement wall).	Discussions, explanations, case studies, demonstration of solution variants, individual work, modelling exercises, verification calculations, interpretation of results, error analysis, etc.	4 hours
II. Preliminary design requirements, shear walls (diaphragms) geometric characteristics – Cross section.		2 hours
III. Loads evaluation: permanent loads (self-weight), variable loads (live loads, snow load, dividing walls) and accidental actions (seismic loading). Combination the actions effects on the structure.		3 hours
IV. Building structure sectional characteristics. Shear walls rigidity estimation. Equivalent moments of Inertia		5 hours
V. Distribution of the vertical and horizontal loads to the vertical structural elements. Load effect diagrams on the elements (M, N, T for walls and connecting beam) calculation.		5 hours
VI. Evaluation of the strength design conditions in the analyzed building elements. Shear-wall and connecting beam reinforcement design and stress condition checking (for eccentric compression and shear).		7 hours
VII. Plans with diaphragms reinforcement and characteristic details.Final evaluation of the project.		2 hours
Reading list for the seminar / laboratory / project: 1. R. A. Pescaru – Civil Constructions 2 – Project Guide – on web: https://edu.tuiasi.ro/course/view.php?id=3729# section-2 , 2025 2. R.A. Pescaru - Civil Constructions * Building Elements, Ed. Soc. Acad. "Matei-Teiu Botez"-Iasi, ISBN 973-7962-62-1,2005 3. Pescaru R.-A. (2015), Clădiri : îndrumar de proiectare , Edit. Societ. Academice "Matei - Teiu Botez", ISBN 978-606-582-081-		

4. D. Marusceac – Construcții civile, ET București 1998
5. Eurocode - BS EN 1990:2002 - Basis of structural design
6. Eurocode - BS EN 1992-1-1:2004 - Design of concrete structures. General rules and rules for buildings.
7. P100/1 – 2025, P100/1 – 2019, P100/1 – 2013 Cod de proiectare seismică. Prevederi de proectare pentru clădiri

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	20%	50% (min. 5)
		- summative assessment test (final assessment): multiple choice test and solving a given problem or subject	80%	
10.5c Project	Participation in project activities, ability to conduct research/ documentation, and application of knowledge in project work	- project work - project completion - project viva		50% (min. 5)
10.6 Passing requirements Students must be able to describe the main building / construction elements, understand their functional and structural requirements and the connections between the elements in the entire bulding structure. Also, must be able to designe a multistorei buiding with reinforced concrete structural/shear walls, to presnt a repotr with written notes and drowings for a bulding structure based on given requiements.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Associate Professor Radu - Aurel PESCARU, PhD

Project instructor: Lecturer Ruxandra COZMANCIUC, PhD

Date of departmental approval: September 2025
Head of Department, Lecturer Ioana - Sorina Ențuc, PhD

Date of faculty council approval: September 2025
Dean, Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstrations, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Bazele securităţii la incendiu în construcţii** **Fundamentals of Fire Safety in Civil Engineering**			
2.1.2. Course code				CE308			
2.2 Lecture instructor				Dragoș ROȘU, PhD			
2.3 Seminar/laboratory/project/practical session instructor(s)							
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	C	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	2	3.2 lecture	2	3.3a seminar		3.3b laboratory		3.3c project		3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	28	3.5 lecture	28	3.6a seminar		3.6b laboratory		3.6c project		3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	11
Additional research in the library, on specialised electronic platforms, and in the field40	11
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios20	
Assessment[820]	4
Other activities:	

3.7 Total number of individual study hours[9]	22
3.8 Total number of hours per semester[10]	50
3.9 Number of ECTS credits	2

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	- Teaching activities in physical format, at the faculty headquarters: blackboard, video projector, specific teaching materials, etc.; - Teaching activities in synchronous online format (on educational platforms such as Google Meet, Microsoft Teams, Zoom with academic subscriptions), with the necessary equipment for a video conference: computer/ laptop, video camera, microphone, speakers/ headphones, internet connection); - Students will comply with the Code of Student Rights and Obligations and the Regulations provided for by the Charter of the "Gheorghe Asachi" Technical University of Iași.
5.2 for the seminar / laboratory / project [13]	

6. General objective of the course

This discipline will present specific aspects related to the essential requirement "Fire Safety" and will place particular emphasis on the development of the concept of fire safety engineering, considering the updating of technical design regulations to the latest research in the field (both at European and national level).

The theoretical part of the discipline deals with legislative and theoretical aspects, necessary to be known in the fundamental stages of construction, namely: design, execution, use and post-use of constructions/installations. The theoretical approach mainly targets technical design regulations (normatives P118-1, P118-2 and P118-3, etc.).

7. Learning outcomes[14]

Knowledge	The student/ graduate: - explains: how to apply the knowledge acquired in the course for both general and concrete situations of the essential requirement of fire safety; - compares: the knowledge acquired in the course and applied to the practical part of the discipline with the way of managing problems/ challenges in areas of interest; - evaluates: the fire risk for constructions in accordance with the implementation of the fire safety concept, for constructions/installations using technical regulations (norms/ Eurocodes); - defines: the principles, methods, and models of fire safety management; - describes: the organization of fire safety management activity with applicability in fire safety engineering; - uses: technical regulations, IT systems, course support, case studies, as well as other reference documentation in the field; - applies: essential regulations in the field of fire safety (technical design standards, mathematical fire modelling programs).
Skills	The student/ graduate: - uses: the course material, the legislation in the field made available, such as technical and legislative regulations in the field of fire safety; - plans: from the perspective of fire safety, the information acquired in the course, carries out laboratory work corresponding to the evaluation of his/her activity; - operates: with technical and legislative regulations in the field of fire safety as well as mathematical fire modelling programs; - evaluates: using technical design standards and mathematical fire modelling programs for the validation of construction/ installation type structures.
Responsibility and autonomy	The student/ graduate: - respects the principles, norms, and ethical values in the correct and timely execution of professional tasks, by approaching a rigorous, efficient, and responsible work strategy in decision-making to solve problems; - assumes responsibilities to contribute to professional knowledge and practices and/or to review the strategic performance of teams; - permanently informs and documents himself in his own field of activity by appropriately using effective methods and techniques of lifelong learning.

8. Teaching strategies

The teaching activity will use participatory lectures and debates based on Power Point presentations that will be made available to students. The presentations contain images and sketches, so that the information is easy to understand and assimilate. Each course will begin with a brief recapitulation of the concepts covered in the previous course.

The teaching method is also based on discovery learning models facilitated by direct and indirect exploration of reality (experimentation, demonstration, modelling), but also on action-based methods, such as exercise, practical activities and problem solving.)The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (experiments, demonstrations, modelling), as well as action-based methods, such as exercises, practical activities, problem-solving).

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Introduction to Fire Safety	Interactive lecture, debates, explanations	2 hours
9.1.2. Notions about combustion and fires		2 hours

9.1.3. Development of fires in enclosed spaces	Interactive lecture, debates, explanations	2 hours
9.1.4. Fire performance of construction products		2 hours
9.1.5. Fire Safety System in Construction		2 hours
9.1.6. Legislation – Fire Safety – Buildings - I		2 hours
9.1.7. Legislation – Fire Safety – Buildings - II		2 hours
9.1.8. Legislation – Fire Safety – Buildings - III		2 hours
9.1.9. Legislation – Fire safety – installations – I extinguishing		2 hours
9.1.10. Legislation – Fire safety – installations – II detection		2 hours
9.1.11 RO Legislation – Fire safety – installations – III intelligent buildings		2 hours
9.1.12 Fire safety scenario – preliminary		2 hours
9.1.13 Fire modelling and simulation		2 hours
9.1.14 Approval and authorization – fire safety		2 hours

Reading list for the lecture:

1. ROȘU D. – Bazele Securităţii la Incendiu în construcţii, suport de curs, 2025
2. Diaconu-Şotropa, D., Ibănescu, M., Roşu, D. – Fundamental în structurarea şi înţelegerea unui normativ privind securitatea la incendiu a clădirilor. Rev. AICPS Review nr. 4/2008, pp.60-65
3. Diaconu-Şotropa, D., Ibănescu, M., Roşu, D. – Fundamental în structurarea şi înţelegerea unui normativ privind securitatea la incendiu a clădirilor. Rev. AICPS Review nr. 4/2008, pp.60-65
4. Drysdale, D., An Introduction to Fire Dynamics, Second edition, University of Edinburgh, UK
5. Forney, G.P., User's Guide for Smokeview Version 5 – A Tool for Visualizing fire Dynamics Simulation Data, NIST Special Publication 1017-1, January 2008
6. Kerber, S., Evaluation of Ability of Fire Dynamics Simulator to Stimulate Positive Pressure Ventilation in the Laboratory and Practical Scenarios, NIST Special Publication 7315, April 2006
7. Roşu, D., Diaconu-Şotropa, D. – Consideraţii privind evoluţia incendiilor în parcaje subterane înglobate construcţiilor civile, XIIIth Scientific Conference with International Participation - SIGPROT 2010, Bucureşti, May 13-14, 2010
8. Roşu, D., Diaconu-Şotropa, D. – Numerical simulation of exhaust smoke and hot gases processes in fire for areas/buildings with complex geometry. Computational Civil Engineering 2009, International Symposium Iaşi, România, May 22, 2009, pp. 271-280
9. Roşu, D., Diaconu-Şotropa, D. – Simularea numerică a influenţiei fumului şi gazelor fierbinţi în cazul producerii incendiilor în parcaje subterane, XII-th Scientific Conference with International Participation - SIGPROT 2009, Bucureşti, October 15-16, 2009, pp.784-793
10. Normative on fire safety of buildings – indicative P 118-1/2025, approved by order MLPAT no. 267/2025. Official Gazette no. 204 and 204 bis of 10.03.2025
11. Normative on fire safety of buildings, Part II - Extinguishing installations indicative P 118/2-2013, approved by Order of the Minister of Regional Development and Public Administration no. 2.463/2013, with subsequent amendments and supplements, M. Of., p I, no. 595 bis/24.09.2013
12. Normative on fire safety of buildings, Part III - Fire detection, signalling and warning installations, indicative P 118/3-2015, approved by Order of the Minister of Regional Development and Public Administration no. 364/2015, with subsequent amendments and additions, M. Of., p I, no. 243 bis /09.04.2015
13. SR EN 1990:2004, Eurocode: Basis for the design of structures
14. SR EN 1991-1-2:2004, Eurocode 1: Actions on structures. Part 1-2: General actions. Actions on structures exposed to fire
15. Law no. 10/1995 on quality in construction, republished, with subsequent amendments and additions, M. Of. P no. 765 of 30 September 2016
16. Regulation on the classification and classification of construction products based on fire performance, approved by Order of the Minister of Transport, Construction and Tourism and of the Minister of State, Minister of Administration, and Interior no. 1822/394 of 2004, with subsequent amendments and completions, Official Gazette No. 90 of 27.01.2005

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	- summative assessment test (final assessment)	100%	100%
10.6 Passing requirements				

- The student must prove, at the colloquium, that he/she has acquired legislative and theoretical knowledge, necessary to be known in the fundamental stages of construction, namely: design, execution, use and post-use of constructions/installations. The student must obtain a grade of 5 at the colloquium to pass.
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.

Date of completion: September 2025

Lecture instructor: Dragoș ROȘU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGHIAC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

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[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6 Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Inginerie seismică** **Earthquake Engineering**			
2.1.2 Course code				CE309			
2.2 Lecture instructor				Lecturer Mircea - Vasile VENGHIAC, PhD			
2.3 Seminar instructor				Lecturer Mircea - Vasile VENGHIAC, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	4	3.2 lecture	2	3.3a seminar	2	3.3b laboratory		3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	56	3.5 lecture	28	3.6a seminar	28	3.6b laboratory		3.6c project		3.6.d	

Workload distribution[7]	No. of hours
Study based on textbook, course material, reading list and notes	10
Additional research in the library, on specialised electronic platforms, and in the field	5
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	4
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	19
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	Blackboard, projector, flipchart, documentary clips, animations
5.2 for the seminar[13]	Computing equipment, software packages

6. General objective of the course

This course provides an in-depth presentation of the structural behaviour under seismic actions, emphasizing analytical and design methodologies used in modern earthquake-resistant engineering. Core topics include structure of the Earth, earthquake generation mechanism, seismic waves, seismic hazard characterization, ground-motion prediction, seismic scales, response spectra development. Students are engaged with current seismic design codes and learn modelling techniques for single and multi-degree of freedom systems. In the end, students will be able to model, analyse, and design structures to meet prescribed seismic performance objectives.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - describes the main components of the Earth's structure and the tectonic earthquakes generation mechanism; - defines seismic waves types, propagation speed, propagation mechanism; - describes and classifies the causes of earthquakes; - defines the seismic scales (intensity and magnitude scales) and the differences between the two types; - calculation of seismic force for 1 DOF systems; - calculation of seismic forces for n DOF systems and their application to plane structures.
Skills	The student/ graduate: - uses theoretical notions to evaluate the seismic forces in single and multi-degree of freedom structural systems; - plans and solves, the stages of a project for the seismic analysis of single and multi-degree of freedom systems; - uses computational techniques to solve seismic analysis problems.
Responsibility and autonomy	The student/ graduate: - complies with ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; - integrates into workgroups and applies effective relationship-building and teamwork techniques in multidisciplinary teams across different hierarchical levels; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; - develops professional projects in the field of engineering.

8. Teaching strategies

The teaching activity is based on Power Point presentations including pictures, animations, diagrams, and short clips in order to transmit the information as easily and clearly as possible. The lectures are linked with a short recap from previous lectures. All presentations are made available to students at the beginning of the semester.

The teaching techniques mentioned above are the basis of discovery-based learning models facilitated by direct and indirect exploration of real phenomena through practical demonstrations completed by problems solving at the seminar.

9. Content

9.1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Behavior of different building types and their damages due to earthquakes	Interactive lecture, debates, explanations	4 hours
9.1.2. Elements of Seismology: Seismic action nature, seismic action characteristics. Classification of earthquakes. Seismic risk and hazard. Evaluation of seismic action. Romanian earthquakes characteristics		4 hours
9.1.3. Seismic response of 1 DOF systems: 1 DOF structures response to the rigid base displacement. Seismic response spectra. Time history response of 1 DOF system		6 hours
9.1.4. Seismic response of n DOF systems: Structural modeling of structures subjected to seismic actions. Spectral analysis of seismic response. Seismic forces distribution		6 hours
9.1.5. Seismic forces regulation conforming to design codes: Hypotheses and models of seismic calculation. Ductility. Seismic calculation conforming to design codes		4 hours
9.1.6. New systems for seismic protection		4 hours
Reading list for the lecture: 1. Anil Chopra (2020). Dynamics of Structures. Theory and applications to earthquake engineering, Pearson Education Limited 2. Iuliu Dimoiu (2004). Earthquake Engineering, Editura Orizonturi Universitare, Timișoara P100-1/2013: Cod de proiectare seismică, Partea 1, Prevederi de proiectare pentru clădiri.		
9.2a Seminar	Work methods[16]	Observations, allotted time
1. Essay on elements of seismology for construction engineering.	Interactive lecture, explanations, discussions	4 hours
2. Seismic response of 1 DOF systems.	Exercises and problem solving, discussions	8 hours
3. Seismic response of n DOF systems.		8 hours
4. Solving an average complexity structure using a computer program.		8 hours

Reading list for the seminar:
1. Anil Chopra (2020). Dynamics of Structures. Theory and applications to earthquake engineering, Pearson Education Limited
2. P100-1/2013: Cod de proiectare seismică, Partea 1, Prevederi de proiectare pentru clădiri.

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Exam	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	10%	50%
		- summative assessment test (final assessment)	90%	
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities - assessment test		50%
10.6 Passing requirements - to describe the main components of the Earth's structure and the tectonic earthquakes generation mechanism, to define seismic waves types, propagation speed, propagation mechanism, to describe and classify the causes of earthquakes, to define the seismic scales (intensity and magnitude scales) and the differences between the two types, to know how to calculate the seismic forces for n DOF systems and their application to plane structures; - to deliver all complete technical reports for the seminar activities according to the schedule; - to obtain a minimum 5 (five) mark for the final exam and for the seminar.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Mircea - Vasile VENGHIAC, PhD

Seminar instructors: Lecturer Mircea - Vasile VENGHIAC, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGHIAC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Proiectare asistată de calculator** **Computer aided design**			
2.1.2. Course code				CE310			
2.2 Lecture instructor				Lecturer Cerasela - Panseluța NEAGU, PhD			
2.3 Laboratory instructor				Lecturer Cerasela - Panseluța NEAGU, PhD Lecturer Ioana OLTEANU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	C	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar		3.3b laboratory	1	3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar		3.6b laboratory	14	3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	2
Additional research in the library, on specialised electronic platforms, and in the field	2
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	4
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	8
3.8 Total number of hours per semester[10]	50
3.9 Number of ECTS credits	2

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	- Blackboard, projector, internet connection, software access; - Students will respect the Students rights and obligation Code of the Gheorghe Asachi Technical University
5.2 for the laboratory[13]	- Access to laboratories with individual computers, specific software e.g. Axis VM X7, internet connection

6. General objective of the course

In this course you will learn about FE analysis of plane and spatial structures using different computer software. Starting from geometric concepts we proceed to compute different structural requirements using several steps. The steps

for FE analyses of different types of structures can be used in various software and are applied in practical design process. During this lecture, skills in modelling and analysing of structures subjected to static and dynamic loads will be acquired. Also, basic design principles and requirements according to the design codes will be discussed. You will have the possibility to apply what you learn developing skills to evaluate results and work with specific FE computer software.

7. Learning outcomes [14]

Knowledge	The student/ graduate: - explains the steps of design process using a computer software; - compares hand computation with computer based computation; - evaluates analytical data in order to design structures; - defines the general stages of the design process; - describes solutions; - defines the properties of the structural elements; - performs static and dynamic analyses of various structures using specific design computer software; - defines input data (material properties, structural dimensions, cross sections, supports, loads and load cases, specific parameters) for different types of model in a FE software; - applies design codes requirements in the design process.
Skills	The student/ graduate: - uses different FE computer software; - plans stages of solving different civil engineering models; - operates with different input data for structural definition; - critically evaluates processes and results using specific evaluation instruments and methods.
Responsibility and autonomy	The student/ graduate: - complies with ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; - integrates into workgroups and applies effective relationship-building and teamwork techniques in multidisciplinary teams across different hierarchical levels; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; - develops reports and technical presentations which arguments the conclusions obtained through assisted computer design.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (modelling), as well as action-based methods, such as exercises, practical activities, problem-solving. During lectures students will be engaged in brainstorming activities.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Basic principles of the finite elements analysis based of software development. Finite elements modelling applied in civil engineering. Modelling and simulation stages using finite element software.	Interactive lecture, debates, explanations	2 hours
9.1.2. **Finite elements description of 1D elements. Static, dynamic and seismic analyses of 1D finite elements.** One-dimensional elements, plain-strain stress, and two-dimensional elements. Stages of modelling, margin conditions and load applications. Case studies.		8 hours
9.1.3. **Finite Element Analysis of 2D structural elements for static and dynamic loading.** Modelling 2D structures; analysing the response for static and dynamic loads. Results analysis and interpretation.		8 hours
9.1.4. Static analyses of structures supported on elastic foundations (Winkler) modelled with 1D and 2D finite elements. Modelling structures; analysing the response for static and dynamic loads. Results analysis and interpretation. Stages of analysis and case studies for different classes of constructions.		4 hours

9.1.5. **Finite Element Analysis of 3D structures for static and dynamic loading**. Modelling structures; analysing the response for static and dynamic loads. Results analysis and interpretation. Stages of analysis and case studies for different classes of constructions.	Interactive lecture, debates, explanations	6 hours
Reading list for the lecture: 1. Neagu, C.P. Lecture notes (English), electronic version 2025; 2. Neagu, C.P. Applications (English), electronic version 2025; 3. ***, AxisVM X8, Finite element software-User's guide, Inter-CAD Ltd., Budapest, 2025; 4. ***, CSI Berkeley, Users Guide for licensed SAP2000 v.s.23, 2021.		
9.2b Laboratory	Work methods[16]	Observations, allotted time
Laboratory 1. Finite Element Analysis of Truss structures. Case of static loading: Modelling based on FEM of a truss structure using TRUSS finite elements, solving and analysing the response for static, dynamic and static loading combinations. Results analysis and interpretation	Discussions based on specific case studies, explanations, exemplification	2 hours
Laboratory 2. Finite element analysis of a 2D Frame structure. Modelling based on FEM of a 2D frame structure using BEAMS finite elements, solving and analysing the response for static, dynamic and static loading combinations. Results analysis and interpretation		2 hours
Laboratory 3. Static, dynamic and seismic analyses of a structural wall. Modelling based on FEM of a structure using PLATE finite elements, solving and analysing the response for static, dynamic and static loading combinations. Results analysis and interpretation		2 hours
Laboratory 4. Static, dynamic and seismic analyses of slab. Modelling based on FEM of a structure using PLATE/SHELL finite elements, solving and analysing the response for static, dynamic and static loading combinations. Results analysis and interpretation		2 hours
Laboratory 5. Finite element analysis of a 3D structure. Static, dynamic and seismic computation of a spatial frame. Modelling based on FEM of a 3D frame structure using BEAMS and SHELL finite elements, solving and analysing the response for static, dynamic and static loading combinations. Results analysis and interpretation		2 hours
Laboratory 6. Static analyses of a foundation system with elastic support. Modelling based on FEM of a structure using finite elements supported on elastic springs, solving and analysing the response for static, dynamic and static loading combinations. Results analysis and interpretation		2 hours
Laboratory 7. Static analysis of a mat foundation system. Modelling based on FEM of a structure using PLATE/SHELL finite elements, solving and analysing the response for static, dynamic and static loading combinations. Results analysis and interpretation		2 hours
Reading list for the laboratory: 1. Neagu, C.P. Applications (English), electronic version 2025; 2. ***, AxisVM X8, Finite element software-User's guide, Inter-CAD Ltd., Budapest, 2025; 3. ***, CSI Berkeley, Users Guide for licensed SAP2000 v.s.23, 2021.		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Colloquium	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- summative assessment test (final assessment)	100%	50%
10.5b Laboratory	Ability to work in a team. Ability to apply acquired knowledge in practice in different contexts. Capacity for analysis, personal interpretation, originality, and creativity	- completion of laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		50%

10.6 Passing requirements Knowledge of use of a FE software. Knowledge of the stages for solving structures Knowledge of the steps for computing a structure using computer software Knowledge of input and output data manipulation and interpretation Knowledge of creating a virtual model using finite elements Knowledge of performing statically and dynamical analyses for the virtual model and how to evaluate the results. Minimum grade for written test is 5 and for the practical application is also 5. Compulsory attendance at all laboratories.
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.

Date of completion: September 2025

Lecture instructor: Lecturer Cerasela - Panseluța NEAGU, PhD

Laboratory instructor: Lecturer Cerasela - Panseluța NEAGU, PhD

Lecturer Ioana OLTEANU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGHIAC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

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[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză) / Civil Engineering - CE

2. Course information

2.1.1 Course title				**Construcții metalice 2** **Steel Constructions 2**			
2.1.2. Course code				CE311			
2.2 Lecture instructor				Lecturer Andrei - Octav AXINTE, PhD			
2.3 Project instructor				Lecturer Andrei - Octav AXINTE, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	E	2.7 Course type[5]	DD

3. Estimated total time (hours per semester)

3.1 Number of hours per week	4	3.2 lecture	2	3.3a seminar		3.3b laboratory		3.3c project	2	3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	56	3.5 lecture	28	3.6a seminar		3.6b laboratory		3.6c project	28	3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	15
Additional research in the library, on specialised electronic platforms, and in the field	14
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	15
Assessment[8]	4
Other activities:	

3.7 Total number of individual study hours[9]	44
3.8 Total number of hours per semester[10]	100
3.9 Number of ECTS credits	4

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	CE301/ Steel Constructions 1
4.2 Learning outcomes prerequisites	CE116/ Strength of Materials 1, CE205/ Strength of Materials 2, CE201/ Structural Statics and Stability 1, CE210/ Structural Statics and Stability 2, CE211/ Theory of Elasticity and Plasticity, CE310/ Computer Aided Design, CE202/ Technical Drawing and Infographics 2

5. Requirements

5.1 for the lecture[12]	- On-site: video projector, whiteboard, documentary films, etc.; - On-line: educational platform Google Classroom; - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the project[13]	- Computing equipment (laptop/computer/video projector/software); - Steel and joint quality testing laboratory; - The deadlines for submitting papers are established by the head of the discipline, in agreement with the students.

6. General objective of the course

The lecture aims to help students identify the elements that make up a steel structure in the field of civil engineering, their structural and functional role. On this regard, the design and verification methods are presented, according to the design codes, for the purpose of creating specific technical documentation.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - explains the basic elements of steel constructions and the stages of a characteristic analysis; - compares the members that make up the buildings and identifies their structural and functional role; - assess the design characteristics of steel building elements, the section class and the characteristics of the utilised steel; - specifies the design of various building elements under various loads; - identifies analysis methods for the members of the steel structures; - develops the ability to use the design codes for dimensioning/verification of steel building members; - identifies constructive solutions to ensure the strength and stability of steel members.
Skills	The student/ graduate: - identifies and compares various elements for appropriate use within the steel structure; - identifies, critically evaluates and selects the steel grade for designed elements; - identifies the classification of the cross-section of the steel element into a section class; - describes the demands on construction elements, in correlation with their location within the building structure; - selects and applies the appropriate methods when choosing and checking the sections of steel members; - translates the end results into technical documentation/execution projects; - uses digital tools for the project presentation.
Responsibility and autonomy	The student/ graduate: - complies with ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; - integrates into workgroups and applies effective relationship-building and teamwork techniques in multidisciplinary teams across different hierarchical levels; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; - develops professional projects in the field of engineering.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (experiments, demonstrations, modelling), as well as action-based methods, such as exercises, practical activities, problem-solving).

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. STEEL TENSION MEMBERS: Destination, sections, gross and net area, verification of tension members, stiffness criterion	Interactive lecture, debates, explanations	2 hours
9.1.2. CLASIFICATION OF TRANSVERSAL CROSS SECTIONS. GLOBAL ANALYSIS OF STEEL STRUCTURES - DESIGN METHODS		2 hours
9.1.3. STEEL COMPRESSION MEMBERS: 3.1 Destination, sections. Verification to compression of short (robust) and slender members; 3.2 Behaviour to centric compression of an ideal member with constant cross section, buckling of members without imperfections, and of real (industrial) members. Imperfections (geometric and material) and their effects; 3.3 Analysis of slender elements subjected to buckling. Buckling curves. Limits of slenderness of compressed members		4 hours

9.1.4. STEEL MEMBERS IN BENDING - Plate girders and rolled sections: 4.1 Destinations, types of sections, choose of the static scheme, stresses, influence of the cross section upon bending stresses, behaviour in bending. Design to bending considering the class of the cross section. Stresses in elastic and in plastic domains. Plasticization in the cross section of the simply supported beam. Verification to ULS of Strength (bending, shear, bending and shear, bending and axial force); 4.2 Stability analysis at ULS: general instability in elastic of a simply supported beam, critical bending moment for flexural torsional buckling, influence factors of bending moment). Instability of beams laterally restrained and unrestrained beams, beams as parts of floor systems, beams designed to develop plastic hinges; local stability of the compressed parts of the beams, verifications to buckling, post-critical resistance to buckling, resistance to shear buckling, current transversal stiffeners, end posts, longitudinal stiffeners; checking the resistance to transversal loading of the web, buckling of the web due to the local instability of the compressed flange. Shear lag; 4.3 ULS analysis: fatigue (behaviour to fatigue, failure to fatigue, design methods, factors influencing the resistance to fatigue, verifications to fatigue; SLS analysis: stiffness, vibrations		10 hours
9.1.5. STEEL MEMBERS IN BENDING - Trusses: 5.1 Constructive details, sections, internal forces in members, buckling lengths, joints and connections, welded and bolted connections, connections between transportation parts; 5.2 Trusses made of hollow sections, constructive design solutions of connections, principles of design and analysis of truss connections; 5.3 Stiffness analysis of steel trusses		4 hours
9.1.6. STEEL MEMBERS IN COMPRESSION AND BENDING -Beam Columns: 6.1 Destinations, sections, elevation; 6.2 Stability of compressed and bended elements, influence of the imperfections, buckling lengths, verification to buckling, verification of resistance to compression and bending; 6.3. Battened and laced sections of columns: shear stiffness of battens, internal force in the leg, buckling of the most compressed leg; 6.4 Constructive solutions to insure against seismic action the beam to column connections, continuity connections for columns; 6.5 Steel column bases: constructive details, rigidity of the base connection, resistance of the base, T stub element, anchor bolts and their design, solutions for transferring the shear force to the foundations, on site erection of columns		6 hours

Reading list for the lecture:

1. Axinte A.O. (2025-26)- Steel constructions 2, Lectures notes
2. Axinte, E., Roşca, V., Teleman, C., Melenciuc S.C. (2012) - Elemente din oţel pentru construţii, vol 3, Ed. Soc. Academice "Matei-Teiu Botez" Iaşi
3. Axinte, E., Roşca, V., Teleman, C. (2010) - Elemente din oţel pentru construcţii, vol.2, Ed. Soc. Academice "Matei-Teiu Botez" Iaşi
4. Axinte, E., Axinte, A., Roșca, V., Teleman, C. (2021) - Noduri structurale ale construcțiilor din oțel. Alcătuire și calcul, Ed. PIM Iași
5. Subramanian, N., (2010). Steel structures. Design and practice, Oxford University Press
6. Jaspart, J.P., Weynand, K., (2016). Design of joints in steel and composite structures EC 3: Design of steel structures Part 1-8- Design of Joints EC 4: Design of composite steel and concrete structures Part 1-1 – General rules and rules for buildings, ECCS
7. Trahair, N.S., Bradford, M.A., Nethercot, D.A., Gardner, L., (2008). The Behaviour and Design of Steel Structures to EC3, Taylor & Francis
8. Jack, C., McCormac, Stephen, F., Csernack (2012). Structural Steel Design, Fifth Edition, Pearson Education Limited, Esssex CM202JE, England, ISBN 10:0-273-75135-2, ISBN 13:978-0-273-751135-9
9. Charles, G., Salmon, John, E. Johnson, Faris, A., Malhas, (2012). Steel Structures-Design and Behavior, Pearson International Edition, New Jersey, USA, ISBN-10: 0-13-206119-8, ISBN-13: 978-0-13-206119-3
10. Mackay of Chatham, Edit.,(2012), Steel Designer's Manual, IV edition, B.P.S. Professional books, Kent, Great Britain
11. SR EN 1990:2004/A1:2006/NA:2006, Basis of structural design
12. SR EN 1993-1-1/2006 Eurocod 3: Design of steel structures. Part 1-1: General rules and rules for buildings
13. SR EN 1993-1-8/2006 Eurocod 3: Design of steel structures. Part 1-8: Design of joints

9.2c Project	Work methods [17]	Observations, allotted time
Project Theme: **Design of a Steel Industrial Platform for Working Activities and Storage** The project's objective is to design a platform used for work and storage, made up of steel elements and placed inside an industrial building. The material used for the platform's structure is S235JR structural steel. The deck is made of corrugated steel plates, sitting over a network of secondary beams, supported by girders (main beams). The girders rest on steel columns. The secondary beams should be designed using hot rolled steel profiles best suited for beams (IPN / IPE). The corrugated plates utilized for the deck are diamond ribs TS5 (type II). The girders will have a I shape composed cross-section, made by welding three plates together. The platform columns will be embedded in the foundation and will be made of wide flanges I-shaped hot rolled steel profiles (HEA/ HEB/ HEM).	Discussions, explanations, case studies, individual work	2 hours
Stage 1. Theme, layout of the constructive solution, scale 1/100. Checking of the steel sheet.		2 hours
Stage 2. Design of the secondary beam and checking its strength and stiffness.		2 hours
Stage 3. The girder: design and verification of strength to bending and shear.		2 hours

Stage 4. The girder: verification of stiffness. Checking the strength of the welding between the web and the flange.	Discussions, explanations, case studies, individual work	2 hours
Stage 5. Ther girder: verification of the general stability: transversal stiffeners of the web.		2 hours
Stage 6. The girder; local stability of the compressed parts of the girder.		2 hours
Stage 7. The connection with splices between two girders (using high strength slip resistance bolts and a C category connection).		2 hours
Stage 8. Beam to girder support design. The sketch of the girder at 1/10 scale.		2 hours
Stage 9, 10. The design of the column section and analysis (strength and stability).		2 hours
Stage 11. Designing the capital and the base of the column.		2 hours
Stage 12. The analysis of the column to foundation joint.		2 hours
Stage 13. The column's drawing using 1/10 scale (1/5 scale for details).		2 hours
Stage 14. The final project evaluation.		2 hours

Reading list for the project:

1. Axinte A., Steel Structures 2, Project support, 2025-26
2. Axinte, E., Roşca, V., Teleman, C., Melenciuc, S.C., Elemente din oţel pentru construcţii, vol.3, Editura Societăţii Academice "Matei-Teiu Botez" Iaşi, 2012
3. Roşca, V.E., Axinte, E., Teleman, E.C., Melenciuc, S.C., Băetu, G., Elemente de calcul pentru structuri din oțel. Proiectarea unei platforme după SR EN 1993, Editura Societăţii Academice "Matei-Teiu Botez" Iași, 2013
4. Axinte, E., Axinte, A., Roșca, V., Teleman, C., Noduri structurale ale construcțiilor din oțel. Alcătuire și calcul, Ed. PIM Iași, 2021
5. Jaspart, J.P., Weynand, K. - Design of joints in steel and composite structures EC 3: Design of steel structures Part 1-8- Design of Joints EC 4: Design of composite steel and concrete structures Part 1-1 – General rules and rules for buildings, ECCS, 2016;
6. Subramanian, N. - Steel structures. Design and practice, Oxford University Press, 2010
7. EN 1993-1-1-2007 Eurocode 3: Design of steel structures – Part 1–1: General rules and rules for buildings
8. EN 1993-1-8-2007 Eurocode 3: Design of steel structures-Part 1-8: Design of joints

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- summative assessment test (final assessment)	100%	50% (min. 5)
10.5c Project	Participation in project activities, ability to conduct research/ documentation, and application of knowledge in project work	- project work - project completion - project viva		50% (min. 5)
10.6 Passing requirements To find the optimal solution for a steel construction member based on some imposed parameters.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Andrei - Octav AXINTE, PhD

Laboratory instructor: Lecturer Andrei - Octav AXINTE, PhD

Date of departmental approval: September 2025

Head of Department,
Lecturer Ioana - Sorina ENȚUC, PhD

Date of faculty council approval: September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstrations, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Fundații** **Foundations**			
2.1.2. Course code				CE312			
2.2 Lecture instructor				Professor Irina LUNGU, PhD			
2.3 Project instructor				Lecturer Oana - Elena COLȚ, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time

3.1 Number of hours per week	5	3.2 lecture	3	3.3a seminar		3.3b laboratory		3.3c project	2	3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	70	3.5 lecture	42	3.6a seminar		3.6b laboratory		3.6c project	28	3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	10
Additional research in the library, on specialised electronic platforms, and in the field	5
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	15
Assessment[8]	6
Other activities:	

3.7 Total number of individual study hours[9]	30
3.8 Total number of hours per semester[10]	100
3.9 Number of ECTS credits	4

4. Prerequisites

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	Strength of Materials 1, Geotechnics

5. Requirements

5.1 for the lecture[12]	On-site: Whiteboard and video projector, desktop/laptop for numerical simulations.
5.2 for the project[13]	On-site: Whiteboard and geotechnical laboratory equipment.

6. General objective of the course

The general objective of the Foundations course is to equip students with the knowledge and skills to select and design new foundation systems, retaining structures, and water removal works in correlation with the soil investigation report, structural requirements, and appropriate technologies. During classes the subjects will cover also the sustainable development for new infrastructure works as well as digital transformation implementation for both the design and technological processes.

7. Learning outcomes[14]

Knowledge	The students/ graduates: – Understand the basic terms, definitions, and the general criteria to classify the foundation systems (shallow, deep, special/mixed) in correlation with structural and site conditions; – Define and identify intersections of the primary factors of influence that influence the choice and depth of foundations (e.g., soil type, structural loads, groundwater level, close vicinities); – Understand and explain the Limit States (ULS and SLS) and the design procedure for shallow foundations (individual, strip, beams network, and mat); – Know the different types of piles and the fundamental principles for evaluating the single pile resistance and the effects of a pile group; – Identify the basic design elements, classifications, and typical construction technologies for caissons; – Describe the main components of the retaining structures; – Understand the description and use of the basic water removal works (dewatering)
Skills	The students/ graduates: – Apply the fundamental design principles to determine the appropriate dimensions complying with the ULS and SLS conditions for shallow foundations; – Calculate the resistance (in compression, pull-out, and transversal load) for a single pile using standardized methods, evaluate the group effect and check for the ULS in correlation with the structural conditions; – Determine the loads on a simple retaining wall and perform fundamental stability (ULS) checks; – Sketch a typical infrastructure cross-section that includes the foundation element(s) with the corresponding vertical structural element(s) and indicate the relevant dimensions
Responsibility and autonomy	The students/ graduates: – Comply with the ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; – Integrate the multidisciplinary of information in their tasks, using also the team work efficiency to reach conclusions and develop sound decision-making abilities; – Continually seek information and updates on the knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; – develops professional projects in the field of engineering

8. Teaching strategies

The teaching activities will integrate the model of Flipped Classroom type, with interactive lectures and debates on case studies, based on PowerPoint presentations/video materials that will be made available to students, together with description of relevant case studies. The presentations contain brief descriptions/definitions/classifications, images, flowcharts, relationships, and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

During the project classes, the teaching methods combine a demonstrative component with a practical one.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
1. General terms and requirements in foundation engineering: Terms and definitions, identification of foundation elements, classification of foundations in correlation with relevant types of structures, factors of influence and alterations of the foundation depth for each particular case, graphical representation of regular infrastructure cross section.	Pre-assigned learning materials, interactive lectures, debates, explanations	6 ore
2. Analysis and design of shallow foundations: Limit states in shallow foundation design, foundation loads, soil resistance, settlement prediction, factors of safety, individual/isolated foundations, network of foundation beams, mat foundations, wall foundations, technological issues		9 ore
3. Analysis and design of pile foundations: Terms and definitions, pile classifications, limit states in pile foundation design, single pile resistance, resistance of piles in a group, pile load tests, pile group design, pilling technologies, basic representations		9 ore
4. Analysis and design of caissons: Terms and definitions, pre-design elements, classification of caissons, geotechnical and structural design, technological issues		3 ore

5. Excavation works: Unsupported slopes - slope stability evaluation, vertical and horizontal bracings, sheet piles - classifications, specific technologies, relevant representations and drawing plans	Pre-assigned learning materials, interactive lectures, debates, explanations	6 ore
6. Retaining walls: Terms and definitions, classifications, limit states in retaining wall design, evaluation of the lateral earth pressures, the influence of the underground water level, specific technologies		6 ore
7. Water removal works: Terms and definitions, well points, deep well pumps, drainage works		3 ore

Reading list for the lecture:
1. Foundations – Course Notes, 2025/2026 https://edu.tuiasi.ro/course/view.php?id=3197
2. Bowles, J. E. [1982] - Foundation analysis and design, 1982, McGraw Hill Book, New York
3. Tomlinson M., Woodward J., [2008], Pile Design and Construction Practice, Taylor & Francis Group, London and New York
4. Eurocode 7, 1997-1, [2004], General rules
5. https://www.structuralguide.com/design-of-excavation-support-systems/
6. https://www.structuralguide.com/types-of-foundations/
7. http://mtp.itd.co.th/ITD-CP/data/PileFoundationDesign.pdf
8. https://www.structuralguide.com/eccentrically-loaded-foundations/
9. https://www.researchgate.net/publication/343796776_Study_and_Analysis_of_Types_of_Foundation_and_Design_Construction
10. https://www.researchgate.net/publication/303954003_Tall_building_foundations_design_methods_and_applications
11. https://www.fhwa.dot.gov/engineering/geotech/pubs/010943.pdf
12. https://eurocodes.jrc.ec.europa.eu/doc/2013_06_WS_GEO/presentations/02-Scarpelli-Design-of-spread-foundations.pdf
13. https://www.structuralguide.com/mat-foundation/
14. https://www.issmge.org/education/recorded-webinars/meeting-the-challenges-of-foundation-design-for-tall-buildings

9.3c Project	Work methods[17]	Observations, allotted time
Design of rigid and flexible individual footings – identification of relevant site conditions, selecting of the appropriate construction materials and foundation elements for a particular case, geotechnical design, structural design, graphical representation	Explanations about design stages and methods for different types of foundation, retaining wall, man-made slope stability Checking of the students' work on designing foundation for a specific dataset	8 ore
Design of foundation beams – identification of relevant site conditions, tentative dimensions based on construction materials and soil profile, selecting the relevant load cases, geotechnical design, structural design, graphical representations		4 ore
Design of mat foundations – identification of relevant site conditions, tentative dimensions based on the structural configuration, basic evaluation of loads on the foundation elements, geotechnical design		4 ore
Pile foundations design - identification of relevant site conditions, selecting a pile type, basic evaluation of loads on the foundation elements, resistance of a single pile, resistance of a pile from a pile group, computing the number of piles, distribution of piles over the raft, distribution of loads over the piles, checking resistance and stability of both piles and foundation soil, graphical representation		4 ore
Retaining wall design – identification of relevant site conditions, selecting corresponding type of wall, tentative dimensions, load evaluation, checking stability restrictions, conclusions		4 ore
Design of man-made slopes – identification of relevant site conditions, geotechnical design, graphical representation		4 ore

Reading list for project:
1. Project notes – 2020-2021 https://edu.tuiasi.ro/course/view.php?id=3197
2. Eurocode 7, 1997-1, [2004], General rules
3. https://www.researchgate.net/publication/328346214_Using_Problem-Based_Learning_to_Enable_Application_of_Foundation_Engineering_Knowledge_in_a_Real-World_Problem
4. N. Boţu, V. Musat, O. Colt, M. Aniculaesei, Fundatii vol.I, Ed. Societăţii Academice "Matei Teiu Botez", 256 pag., 2015, Iaşi
5. Stanciu A., Lungu I., [2006], Fundaţii I – Fizica şi mecanica pământurilor, Editura Tehnică, Bucureşti
Popa A., Ilieş N.M., [2013], Fundații, Editura Casa cărții de știință, Cluj Napoca

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Accuracy of defining the basic terms Logical coherence, fluency, and strength of argumentation Capacity to draw regular foundation types as cross-section with correlated plan view	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)		50%
		- formative assessment test (tests during the semester)		

	Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	Examination procedures and conditions: Part 1: written test with identical subjects for all students in the group, with the corresponding scoring board Part 2: 1 to 1 discussion based on the written test	100%	
10.5b Laboratory	Ability to work in a team. Ability to apply acquired knowledge in practice in different contexts. Capacity for analysis, personal interpretation, originality, and creativity	- completion of the project Part 1: Written Test - minimum grade 5 Part 2: 1 to 1 discussion based on the project		50%
10.6 Passing requirements The final exam is the part focused on problem-solving and synthesis of knowledge. The student needs to demonstrate the ability to solve simple problems in key areas like: - Define the concepts of shallow foundation and deep foundation; - State the difference between the Ultimate Limit State (ULS) (failure) and the Serviceability Limit State (SLS) (excessive settlement); - List at least two common types of individual/isolated foundations and two types of deep foundations (e.g., piles); - Identify the two main components of single pile resistance (tip resistance and shaft friction); - Identify and apply a graphical representation of the typical loads acting on a retaining wall for simple soil profiles.				
The final grade for this course is determined by taking into account the scores and weightings assigned to each task. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Professor Irina LUNGU, PhD

Project instructor: Lecturer Oana - Elena COLȚ, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Oana - Elena COLȚ, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Construcții din lemn** **Timber structures**			
2.1.2. Course code				CE313			
2.2 Lecture instructor							
2.3 Project instructor				Lecturer Ioana - Sorina ENȚUC, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	E	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar		3.3b laboratory		3.3c project	1	3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar		3.6b laboratory		3.6c project	14	3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	28
Additional research in the library, on specialised electronic platforms, and in the field	15
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	15
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	58
3.8 Total number of hours per semester[10]	100
3.9 Number of ECTS credits	4

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	Elements of Architecture and Urban Planning, Structural Statics and Stability 1&2, Strength of Materials 1&2, Civil Buildings

5. Requirements

5.1 for the lecture[12]	Blackboard, video projector, specific teaching materials. Students will respect the Code of Student Rights and Obligations and the Regulations provided by the "Gheorghe Asachi" Technical University of Iași
5.2 for the project[13]	Computer equipment, video projector, software packages, graphics tablet. The deadlines for submitting the work are set by the lecturer, in the last week of the semester

6. General objective of the course

The course shall give understanding and knowledge about wood as a sustainable building material, about structural properties and behaviour of timber structures under different types of loads. You will be able to identify the structural timber elements included in a roof, floor, or wall. You will understand the principles of designing timber connections and timber elements at the Ultimate Limit State and at the Serviceability Limit State. During the project

class you will apply the standard methods to design all structural timber elements including rafters, purlins, posts, beams or columns and different types of joints based on a given demand.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - explains the mechanical properties, characteristics, and limitations of timber as a structural material and the behaviour of timber elements subjected to different types of loads; - describes the engineering wooden products and their applications; - uses the design codes and standards to ensure the safety and performance requirements of wooden structures; - defines the preservatives method to protect and increase the durability of timber structures; - explains the role of wood as a sustainable material and its potential for use in timber production
Skills	The student/ graduate: - uses the design methods and software to dimension load-bearing elements and connection for ultimate and serviceability limit states; - applies the principles of mechanics of materials and statics establish load effects on structural elements; - calculates simple and complex timber connections using fasteners; - critically evaluates and applies problem-solving skills to various technology contexts
Responsibility and autonomy	The student/ graduate: - complies with ethical principles, norms, and values in completing professional tasks correctly and on time, by adopting a rigorous, efficient, and responsible work strategy in decision-making and problem-solving; - integrates into workgroups and respects the imposed deadlines; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; - develops professional projects in the field of civil engineering; - adapts to market requirements, choosing sustainable solutions for the design and execution of timber structures.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations include multimedia content (audio and/or video, animation), so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class and will conclude with a short application to consolidate the knowledge taught.

The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (experiments, demonstrations, modelling), as well as action-based methods, such as exercises, practical activities, problem-solving.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. General design considerations. Wood as construction material: Introduction. The use of wood in construction. Advantages and disadvantages of using wood as construction material. Classification of wood products. Wood degradation. Methods for the protection of wood	Interactive lecture, debates, explanations, case studies	2 hours
9.1.2. Wood properties: The physical properties of interest for construction. Elastic anisotropy of wood. Weight and specific density; Humidity actions on wood material. The mechanical properties of wood. Strength classes		2 hours
9.1.3. The use of wood in construction: Terminology which is specific for timber construction. Building timber elements and/ or timber structures		2 hours
9.1.4. Design methods for timber construction: Design methods and methodologies; Loads. Specific loads combinations for timber elements; Design steps for timber structures		2 hours
9.1.5. Timber elements design: Composition rules of timber construction. Design of timber elements with simple cross – section. Design of timber elements with composed cross - section		2 hours
9.1.6. Timber connections design: Introduction. Classification. Framed joints. Mechanically fastened joints and metal connectors. Glued joints		2 hours

9.1.7. Timber roof structures: Introduction. General requirements. Composition and design of traditional timber roof structures. Composition and design of modern timber roof structures	Interactive lecture, debates, explanations, case studies	2 hours
9.1.8. Timber floor structures: Composition and design of traditional timber floor structures. Composition and design of modern timber floor structures		2 hours
9.1.9. Timber frame structures: Composition and design of traditional timber frame structures. Composition and design of modern timber frame structures		2 hours
9.1.10. Complex timber elements and structures: Glue laminated timber. Elements based on wood structure. Hybrid wooden structures		2 hours
Reading list for the lecture: 1. Ențuc I.S. – Lectures notes, 2025, https://edu.tuiasi.ro/course/view.php?id=1608 2. Ențuc I.S, Sococol I., Proiectarea structurilor complexe din lemn, Ed. Societății Academice „Matei - Teiu Botez" Iași, 2025 3. Ențuc I.S., Proiectarea structurilor din lemn pentru acoperișuri în pantă, Ed. Soc. Academice "Matei - Teiu Botez", 2018. 4. Neculai O., Isopescu D.N., Timber Structures – Building Elements Design, Ed. Societății Academice Matei-Teiu Botez, 2017 5. M. H. Ramagea, H. Burridge et all, The wood from the trees: The use of timber in construction, Renewable and Sustainable Energy Reviews 68 (2017) 333–359, 2017 6. Isopescu D.N., Neculai O., Lemnul în construcții – Ghid de proiectare, 2015 7. Isopescu D., Stănilă O. 2014, Lemnul în construcții – Îndrumar pentru lucrări de laborator, Editura Matei-Teiu Botez, 2014 8. Porteous Jack - Structural Timber Design to Eurocode 5, 2013 9. Decher E., Construcţii din lemn, Ed. Societății Academice „Matei Teiu Botez", Iași, 2003 10. Marusceac D. – Construcţii moderne din lemn, Ed. Tehnică, București, 1992 11. NP005-2022 – Normativ privind proiectarea și verificarea construcțiilor din lemn 12. SR EN 1995 – 2005 / EUROCODE 5 – Proiectarea structurilor din lemn		
9.2c Project **Design a timber structure: ground floor and attic/loft (P+M/P)**	Work methods [18]	Observations, allotted time
Configuration of timber structures. Choosing functionality of building: Setting dimensions in plan and elevation; Constructive solutions.	Case study, demonstration, exercise, interpretations results, individual work	2 hours
Estimation of parameters necessary to design: Design resistance evaluation of timber products used. Evaluation of loads on structural elements of: timber roof, timber floor, and timber exterior wall structures.		4 hours
Computations and design of timber structural elements for ULS and SLS: Design of the timber floor structural elements; Design of the timber roof structural members; Design of the exterior timber wall panels		6 hours
Computations and design of characteristic timber connections		2 hours
Reading list for the lecture: 1. Ențuc I.S. – Project support, 2025, https://edu.tuiasi.ro/course/view.php?id=1608 2. Ențuc I.S, Sococol I., Proiectarea structurilor complexe din lemn, Ed. Societății Academice „Matei - Teiu Botez" Iași 2025 3. Ențuc I.S., Proiectarea structurilor din lemn pentru acoperișuri în pantă, Ed. Soc. Academice "Matei - Teiu Botez", 2018. 4. Neculai O., Isopescu D.N., Timber Structures – Building Elements Design, Ed. Societății Academice Matei-Teiu Botez, 2017 5. Isopescu D.N., Neculai O., Lemnul în construcții – Ghid de proiectare, 2015 6. Isopescu D., Stănilă O. 2014, Lemnul în construcții – Îndrumar pentru lucrări de laborator, Editura Matei-Teiu Botez, 2014 7. Porteous Jack - Structural Timber Design to Eurocode 5, 2013 8. NP005-2022 – Normativ privind proiectarea și verificarea construcțiilor din lemn 9. SR EN 1995 – 2005 / EUROCODE 5 – Proiectarea structurilor din lemn		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- summative assessment test (final assessment): multiple choice test and solving a given problem	100% (min. 5)	50% (min. 5)
10.5c Project	Participation in project activities, ability to conduct research/ documentation, and application of knowledge in project work	- project work - project completion - project viva		50% (min. 5)

10.6 Passing requirements
The student must be able to design timber structures and connections and to select the most suitable timber element or wooden product for different structural systems and explain the pros and cons. The student must be able to present a report with written notes and drawings for a timber structure based on given conditions regarding user demands
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.

Date of completion: September 2025

Lecture instructor: Lecturer Ioana - Sorina ENȚUC, PhD

Project instructor Lecturer Ioana - Sorina ENȚUC, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Ioana - Sorina ENȚUC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc*.

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Tehnologia lucrărilor de construcții 1** **Technology of Constructions Works 1**			
2.1.2. Course code				CC314			
2.2 Lecture instructor				Lecturer Ciprian-Ilie COZMANCIUC, PhD			
2.3 Seminar instructors				Lecturer Ciprian-Ilie COZMANCIUC, PhD Lecturer Vlad LUPĂȘTEANU, PhD Lecturer Radu LUPĂȘTEANU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	C	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar	1	3.3b laboratory		3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar	14	3.6b laboratory		3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	15
Additional research in the library, on specialised electronic platforms, and in the field	6
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	12
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per ssssssemester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	- Video projector, whiteboard, specific teaching materials, documentary videos, etc. - Computer, internet connection, access to the online platform of the "Gheorghe Asachi" Technical University of Iași - Students must comply with the Code of Student Rights and Responsibilities and with the Regulations established by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the seminar[13]	- Computing equipment, etc. - Video projector, whiteboard, specific teaching materials, documentary films, etc. - Deadlines for submission of assignments are established by the course instructor in agreement with the students.

	- Computer, internet connection, access to the online platform of "Gheorghe Asachi" Technical University of Iași. - Students are required to comply with the Student Rights and Responsibilities Code and the regulations set forth in the Charter of "Gheorghe Asachi" Technical University of Iași

6. General objective of the course

The purpose of the course is to develop the competencies necessary for planning, organizing, and executing construction works with quality, efficiency, and safety. Students will learn to apply modern construction technologies for earthworks, material transport, formwork, and scaffolding, to optimize workflow, and to integrate innovative equipment and methods. The course also enhances the ability to make informed technological decisions and to ensure that construction works comply with project specifications, standards, and current market requirements.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - Understands, assimilates, and explains the technological principles and general organization for executing earthworks, including types and methods of excavation, shoring, dewatering, and soil compaction; - Understands and determines the organization of the construction site and the technological workflows required for carrying out construction works; - Evaluates and establishes the appropriate methods for horizontal and vertical transportation of construction materials; - Understands and assimilates the typologies of formwork, scaffolding, and falsework, along with the principles of calculation, assembly, and inspection; - Understands the general characteristics related to the processing, transportation, storage, and installation of reinforcement for concrete; - Understands the importance of applying technical regulations and following inspection and acceptance procedures for the main categories of construction processes; - Assimilates concepts regarding the technological processes specific to the main execution stages in the construction industry.
Skills	The student/ graduate: - Selects the optimal technological method for excavation, shoring, compaction, and material transportation, depending on site conditions and project specifics, correlating own solutions with recommendations and technologies provided by construction suppliers; - Aligns technological processes with site organization to ensure an efficient, coherent, and safe workflow; - Applies the principles of sizing and configuration of formwork systems for various reinforced concrete structural elements; - Evaluates the techniques for processing, shaping, and assembling concrete reinforcement in accordance with standards and technical documentation; - Assesses the quality of technological works and identifies non-conformities or risks associated with execution stages
Responsibility and autonomy	The student/ graduate: - Responsibly applies health and safety measures specific to earthworks, formwork, reinforcement, and material handling operations, demonstrating a preventive attitude and compliance with on-site protection regulations; - Makes technically grounded decisions in planning and organizing work stages, within the competencies of an engineer in training, while adhering to technical documentation and applicable regulations; - Manages practical tasks autonomously during seminar activities and correctly organizes the sequence of technological processes, from preparation to evaluation of results; - Integrates effectively into work teams and collaborates in applied site exercises, assuming responsible technical roles and contributing to resolving situations specific to the construction environment; - Respects professional ethics principles and values by executing technological tasks accurately, rigorously, and on time, adopting a responsible approach in reporting observations and identified non-conformities; - Develops professional autonomy through continuous information gathering and documentation, using updated technical sources and effective learning methods with direct applicability to design and execution activities; - Participates in the development of projects and technological solutions specific to civil engineering, integrating theoretical knowledge with the practical requirements of on-site execution.

8. Teaching strategies

The courses will be delivered through participative lectures and discussions supported by PowerPoint presentations containing images, sketches, and video materials to facilitate the understanding of concepts, all of which will be made available to students. Each session begins with a recap of previously covered topics. The teaching approach combines practical industry examples, demonstrations, and modelling, along with exercises and hands-on activities to develop applied competencies. Possible site visits will allow direct observation of the studied technologies, reinforcing learning through experience.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Earthworks Technology: Preparatory works and site organization (site plans, routes, utilities). Layout and marking of construction works on site. Execution of excavations: manual and mechanized, including specific methods and equipment. Temporary and permanent supports for excavations. Backfilling, compaction, and dewatering: materials, techniques, and equipment. Equipment specific to earthworks: excavators, bulldozers, compactors, etc. Acceptance of earthworks: technical criteria and quality verification.	Interactive lecture, Use of video projector, Discussions, Explanations	10 hours
9.1.2. Construction Transport: Horizontal transport: methods, equipment, safety, and efficiency. Vertical transport: crane, hoist, special scaffolding. Aspects of material handling and storage. Coordination of transport with site planning and workflow processes.		4 hours
9.1.3. Formwork Technology for Concrete, Scaffolding, and Shoring: Definitions and general concepts. Types of formworks and scaffolding: materials, composition, classification. Formwork calculation and dimensioning of support elements. Arrangement of formwork systems for main reinforced concrete structural elements (columns, beams, slabs, foundations). Transport, handling, storage, and assembly of formwork. Stripping and proper dismantling procedures. Scaffolding and shoring: types, assembly, safety, and inspection. Equipment and machinery used in formwork. Verification and acceptance of formwork works: standards and quality criteria.		12 hours
9.1.4. Reinforcements for Constructions: Definitions, characteristics, and classification of concrete reinforcements. Preparatory works: storage and handling of reinforcements. Processing and shaping of reinforcements (cutting, bending, assembly). Installation of reinforcements in structural elements. Verification and acceptance of reinforcement work: compliance with the design and standards.		2 hours
Reading list for the lecture: 1. Standard for the production of concrete and execution of works in concrete, reinforced concrete, and prestressed concrete – Part 1: Concrete production, designation NE 012/1 – 2022; 2. Standard for the production of concrete and execution of works in concrete, reinforced concrete, and prestressed concrete – Part 2: Execution of concrete works, designation NE 012/2 – 2022; 3. Standard for the execution of earthworks for the foundations of civil and industrial buildings, designation C 169-1988; 4. Guide for the execution of horizontal and vertical drainage works, designation GE 028-1997; 5. Guide for compaction execution on horizontal and inclined embankments, designation GE 026-1997; 6. Methodology for elaborating requirements for technical means and equipment used in construction works, IM 004-1996; 7. Handbook on maintenance of technological equipment in operation, for ensuring construction works quality, NE 003-2015; 8. Robert Schmitt, Moving the Earth: Excavation Equipment, Methods, Safety, and Cost, 7th Ed., McGraw-Hill Education, 2018; 9. Roy Chudley, Roger Greeno, Building Construction Handbook, 12th Edition, ISBN: 0367135434, 2020. 10. Vaibhao K. Sonarkar, Construction Technology, ISBN: 9789388897099, 2019. 11. E. Pamfil, Construction Works Technology, Vol. I, Formwork, Academic Society "Matei-Teiu Botez", Iași, 2006. 12. A. Vasilescu, Construction Works Technology – Examples of Technological Design, Politehnium Publishing, Iași, 2004; 13. Awad S. Hanna, Concrete Formwork Systems, CRC Press, 2019.		
9.2a Seminar	Work methods[16]	Observations, allotted time
Assignment 1. Technology of Mechanized Excavation Works	Discussions, explanations, case studies, interpretation of results	4 hours
Assignment 2. Technology of Vertical Material Transport with Cranes		2 hours
Assignment 3. Technology of Concrete Formwork Works		8 hours
Reading list for the seminar: 1. Standard for the production of concrete and execution of works in concrete, reinforced concrete, and prestressed concrete – Part 1: Concrete Production, NE 012/ 1 – 2022; 2. Standard for the production of concrete and execution of works in concrete, reinforced concrete, and prestressed concrete – Part 2: Execution of Concrete Works, NE 012/ 2 – 2022; 3. Pamfil, E., Construction Works Technology, vol. I, Formwork, Academic Society "Matei-Teiu Botez" Publishing, Iași, 2006; 4. Vasilescu, A., Construction Works Technology – Examples of Technological Design, Politehnium Publishing, Iași, 2004; 5. Giușcă, R., Technological Works – Student's Handbook, Politehnium Publishing, ISBN: 978-973-621-190-4, 2007		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Test	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented	- summative assessment test (final assessment)	100%	50%
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities - assessment test		50%
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Ciprian - Ilie COZMANCIUC, PhD

Seminar instructors: Lecturer Ciprian - Ilie COZMANCIUC, PhD

Lecturer Vlad LUPĂȘTEANU, PhD

Lecturer Radu LUPĂȘTEANU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Cătălin ONUȚU, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

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[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Practică de Specialitate** **Speciality Practice**			
2.1.2. Course code				CE315			
2.2 Lecture instructor(s)				-			
2.3 Practical session instructors				Lecturer Vlad LUPĂȘTEANU, PhD Lecturer Radu LUPĂȘTEANU, PhD Lecturer Ciprian - Ilie COZMANCIUC, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	C	2.7 Course type[5]	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	30	3.2 lecture		3.3a seminar		3.3b laboratory		3.3c project	30	3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	120	3.5 lecture		3.6a seminar		3.6b laboratory		3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	
Additional research in the library, on specialised electronic platforms, and in the field	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	
Assessment[8]	
Other activities:	

3.7 Total number of individual study hours[9]	
3.8 Total number of hours per semester[10]	120
3.9 Number of ECTS credits	4

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	-
5.2 for the seminar / laboratory / project[13]	Practical and teaching activities at the headquarters or at the construction sites of the companies where the students will choose to do the speciality practice. Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași Students will respect the conditions imposed or regulated by the construction companies

6. General objective of the course

The course aims to provide students with fundamental and applied competencies related to the execution of construction works by analyzing technological processes and modern execution procedures. Emphasis is placed on ensuring construction quality, productivity, and economic efficiency, particularly for structural systems and components of civil, industrial, and agricultural buildings, as well as on the organization of technological flows and the technological design and management of construction works.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - Acquires fundamental knowledge regarding technological processes and execution methods used in construction works, with emphasis on structural elements of civil, industrial and agricultural buildings; - Understands the principles governing construction quality, productivity and economic efficiency during the design and the execution phase; - Becomes familiar with modern construction technologies, equipment, and materials applied in current engineering practice; - Understands the organization of technological workflows and the interdependence between construction activities on site; - Assimilates basic concepts related to technological design and execution management of construction works.
Skills	The student/ graduate: - Applies technological processes and execution procedures in practical construction activities under site conditions; - Identifies and selects appropriate execution technologies for different types of structural works; - Participates in the organization and scheduling of technological workflows on construction sites; - Prepares basic technological, economical and quality documentation related to execution methods and site organization; - Assists in the structural and/or technological design and monitoring of construction works, considering quality, time, and cost constraints.
Responsibility and autonomy	The student/ graduate: - Carries out assigned practical tasks responsibly, respecting technical regulations, safety rules, and professional ethics specific to construction sites; - Works effectively within construction teams, communicating clearly with supervisors, engineers, and site personnel; - Demonstrates autonomy in observing, analyzing and documenting technological processes encountered during practice activities; - Adapts to real working environments and contributes constructively to problem-solving under guidance; - Develops a professional attitude oriented toward continuous learning and future involvement in construction engineering practice.

8. Teaching strategies

The teaching activities for the Speciality Practice course are based primarily on supervised practical training carried out within construction companies, either on construction sites or in technical and managerial offices, under the direct observation and coordination of the academic supervisor (Lecture instructor). The instructional approach emphasizes experiential learning, allowing students to observe, participate in, and analyse real construction processes under actual working conditions.

Learning is achieved through direct involvement in execution activities, technological workflows and site organization, under the guidance of designated company mentors and in coordination with the academic supervisor (Lecture instructor). Students are exposed to real-life technological processes, execution methods and construction management practices specific to civil engineering works.

The teaching strategy includes guided observation, practical tasks assigned by company supervisors and the analysis of technological and organizational solutions applied on site. Students are encouraged to document observed processes, reflect on applied technologies, and relate practical experience to the theoretical knowledge acquired during previous courses.

Periodic monitoring and evaluation are ensured through practice reports, technical documentation prepared by students, and consultations with the academic coordinator. Where possible, discussions and feedback sessions are

organized to clarify observed execution methods, technological decisions, and organizational aspects, ensuring the integration of practical experience with academic learning objectives.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. **The study of the execution of construction works**	Interactive lecture/ presentation, debates, explanations	6 hours
9.1.2. **Specific activities on construction sites or at the offices of the construction companies regarding the execution of construction works**	Personal study, guided observation, practical tasks,	104 hours
9.1.3. **Preparing the Speciality Practice Training Book.** The Practice Training Book should document and synthesize the student's practical training experience within the construction company, highlighting the activities observed and performed, as well as the technological, organizational, and managerial aspects encountered during the practice period.	Interactive lecture, debates, explanations	10 hours
Reading list: 1. Law 10 – 1995, with subsequent amendments and modifications, regarding quality in construction. 2. Normative C56 – 1985, regarding the verification of quality and acceptance of construction works and related installations. 3. Government Decision 343 / 2017 amending 273/1994 regarding the approval of the regulation for the acceptance of construction works and their related installations. 4. SR EN ISO 9001 – 2015 – Quality Management System. Requirements. 5. Code for the production of concrete and execution of works from concrete, reinforced concrete, and pre-compressed concrete – Part 1: Concrete Production, code NE 012/1 – 2022. 6. Code for the production of concrete and execution of works from concrete, reinforced concrete, and pre-compressed concrete – Part 2: Execution of concrete works, code NE 012/2 – 2022. 7. Other specific references		

10. Assessment

Assessment category	**10.1 Assessment criteria**	**10.2 Assessment method**		**10.3 Percentage of final grade**
10.4 Test	Completeness and accuracy of knowledge Ability to apply acquired skills Ability to process data and stated problems; Theoretical and practical knowledge acquired (quantitative evaluation, correctness, accuracy)	- Preparation of the Speciality Practice Training Book	50%	100%
		- summative assessment test (final assessment)	50%	
10.6 Passing requirements: At least getting a grade of 5 in the tests.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor:

Practical session instructors: Lecturer Vlad LUPĂȘTEANU, PhD

Lecturer Radu LUPĂȘTEANU, PhD

Lecturer Ciprian - Ilie COZMANCIUC, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Cătălin ONUȚU, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Managementul Calității** **Quality Management**			
2.1.2. Course code				CE316			
2.2 Lecture instructor				Lecturer Radu LUPĂȘTEANU, PhD			
2.3 Seminar instructor				Lecturer Radu LUPĂȘTEANU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DO

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar	1	3.3b laboratory		3.3c project		3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar	14	3.6b laboratory		3.6c project		3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	14
Additional research in the library, on specialised electronic platforms, and in the field	5
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	14
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	- Teaching activities at the faculty: blackboard, projector, other teaching equipment; - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the seminar[13]	- Teaching activities at the faculty: blackboard, projector, other teaching equipment; - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași

6. General objective of the course

Drafting and presenting the technical documentation necessary for the authorization and execution of construction works, specifying the importance category, project verification requirements, preparation of the

verification and quality control program, preparation of specifications, etc. Understanding the specific legislation regarding the authorization and execution of construction works. Preparation of technical execution procedures. Simulating quality checks during the execution of construction works and at the acceptance stage upon completion of the works. Understanding the content and structure of technical documentation and the specific processes related to building condition assessment during operation and post-use.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - Learns basic concepts regarding the quality system in the construction field; - Learns basic concepts regarding the preparation of technical documentation necessary for the authorization and execution of construction works; - Familiarizes with technical regulations specific to quality in construction; - Learns basic concepts regarding quality checks during execution; - Learns basic concepts regarding the preparation and implementation of a building condition assessment program for monitoring performance during operation for constructions
Skills	The student/ graduate: - Prepares technical documentation necessary for the authorization and execution of construction works; - Prepares a technical execution procedure; - Prepares a verification and control program; - Prepares technical records for quality acceptance during the execution of works and at the acceptance stage upon completion of the works; - Prepares a program for building condition assessment during operation
Responsibility and autonomy	The student/ graduate: - Respects ethical principles, rules, and values in the correct and timely completion of professional tasks, by adopting a rigorous, efficient, and responsible work strategy and making informed decisions to solve problems; - Integrates into the work group and applies communication and collaboration techniques for effective work within multidisciplinary teams at various hierarchical levels; - Continuously seeks information and documentation in their field of activity by appropriately using effective lifelong-learning methods and techniques; - Develops professional projects in the field of engineering

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images, videos and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

The teaching method is based on practical examples specific to the construction industry. During the courses, site visits to ongoing construction projects may also be organized, with the purpose of presenting the studied concepts in a practical manner.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. **History and Basic Concepts Regarding Quality.** General concepts about quality. The dual nature of the concept. History. Premises for the application of quality management. Factors that influence quality	Interactive lecture, debates, explanations	2 hours
9.1.2. **Specifics of the Quality Approach in Construction.** Defining the stages of making an investment in construction. The particularities of the quality approach in construction activities. Description and analysis of each stage of making a construction investment. The place and role of the discipline within each of the listed stages. Quality and sustainable development. Demands and performance. The quality system in construction		2 hours
9.1.3. **Obligations of the Stakeholders in the Construction, Use and Post-Use of Buildings Regarding Quality Assurance and Control.** Defining all the stakeholders involved in the construction process, as well as those involved in the stages of use and post-use. Description of the obligations and responsibilities of the participants. The		4 hours

legislative framework governing the activity of the stakeholders involved in making a construction investment. Consequences of non-compliance with legal obligations		
9.1.4. **Classes and Categories of Importance of Constructions.** Defining the concepts of importance classes and importance categories. Methodology for determining the category of importance. Correlating the category of importance with the requirements of quality management systems regarding the design, execution, monitoring, and decommissioning of constructions	Interactive lecture, debates, explanations	2 hours
9.1.5. **Requirements for the Market Introduction of Construction Materials and Products. Technical Approval.** Conditions for including in projects and using materials, products, and technical procedures in the execution of constructions. Documents and determinations for certifying the quality of construction materials and products. Declaration of conformity. Technical approval		2 hours
9.1.6. **Quality Technical Verification of Construction Projects.** Defining essential quality requirements. Explaining essential requirements regarding the preparation and verification of construction projects. Areas and conditions for certifying technical project verifiers for constructions		2 hours
9.1.7. **Quality Assurance and Control in the Execution Stage of Construction Works.** Responsibilities regarding quality assurance and control of the site manager and the technical execution manager. Areas and conditions for certification. Technical execution procedures. Technical control procedures. Presentation of the main technical regulations in the field. Forms used		6 hours
9.1.8. **Technical Expertise of Construction Projects, Construction Works, and Buildings.** Situations that may generate the development of technical expertise in construction. The legal framework and the concise content of a quality technical expertise in construction		2 hours
9.1.9. **Acceptance of Construction Works.** The significance and methodology of "acceptance." Acceptance during the execution of construction works. Acceptance upon completion of the works. Final acceptance. The content of the technical book of the construction		2 hours
9.1.10. **Maintenance, Rehabilitation, Consolidation, and Monitoring of the Technical Condition of Constructions.** Defining the requirements for maintenance and changes over time in constructions. Ongoing and special monitoring of the technical condition of constructions. Requirements regarding the post-use stage		4 hours
Reading list for the lecture: 1. Radu Lupășteanu – Lecture Notes "Quality Management" – annually updated. Electronic format is sent to students at the beginning of the semester. 2. Law 10 – 1995, with subsequent amendments and modifications, regarding quality in construction. 3. Law 50 – 1991, with subsequent amendments and modifications, regarding the authorization of construction works. 4. Normative C56 – 1985, regarding the verification of quality and acceptance of construction works and related installations. 5. Government Decision 343 / 2017 amending 273/1994 regarding the approval of the regulation for the acceptance of construction works and their related installations. 6. SR EN ISO 9001 – 2015 – Quality Management System. Requirements. 7. Normative P130 – 2025 regarding the monitoring of operational performance of constructions. 8. Code for the production of concrete and execution of works from concrete, reinforced concrete, and pre-compressed concrete – Part 1: Concrete Production, code NE 012/1 – 2022. 9. Code for the production of concrete and execution of works from concrete, reinforced concrete, and pre-compressed concrete – Part 2: Execution of concrete works, code NE 012/2 – 2022.		
9.2a Seminar	Work methods[16]	Observations, allotted time
Assignment no. 1 Preparation of Technical Documentation Complying with Legal Requirements for the Authorization and Execution of Construction Works (DTAC, PTh). Assembling a project in accordance with the content requirements for the authorization and execution of a construction. Establishing the category of importance. Specifying project verification requirements. Preparing the quality verification and control program for construction works. Drafting a segment of the specifications document.	Discussions, explanations, case studies, interpretation of results	4 hours
Assignment no. 2 Preparation of Technical Execution Procedures. Analysis of the technological content of one or more technological processes and transposing that process from the specifications document and technical regulations into the form of a technical execution procedure. Specifying quality control stages, acceptability conditions, permissible deviations, responsibilities, and tools used.		4 hours
Assignment no. 3 Preparation of Documents for Quality Certification of Construction Works. Preparing specific documents for the quality certification of construction works as they are carried out. Verifying the level and nature of the	Discussions, explanations, case studies,	4 hours

foundation soil, acceptance of formwork and reinforcements prior to concreting, acceptance of concrete after stripping, concrete log, etc.	interpretation of results	
Assignment no. 4 Acceptance Upon Completion of the Works. A brief presentation of the methodology. Preparing the acceptance minutes upon completion of the works and, if applicable, the annexes.		2 hours
Reading list for the seminar: 1. Law 10 – 1995, with subsequent amendments and modifications, regarding quality in construction. 2. Law 50 – 1991, with subsequent amendments and modifications, regarding the authorization of construction works. 3. Normative C56 – 1985, regarding the verification of quality and acceptance of construction works and related installations. 4. Government Decision 343 / 2017 amending 273/1994 regarding the approval of the regulation for the acceptance of construction works and their related installations. 5. SR EN ISO 9001 – 2015 – Quality Management System. Requirements. 6. Normative P130 – 2025 regarding the monitoring of operational performance of constructions. 7. Code for the production of concrete and execution of works from concrete, reinforced concrete, and pre-compressed concrete – Part 1: Concrete Production, code NE 012/1 – 2022. 8. Code for the production of concrete and execution of works from concrete, reinforced concrete, and pre-compressed concrete – Part 2: Execution of concrete works, code NE 012/2 – 2022.		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Test	Completeness and accuracy of knowledge Ability to apply acquired skills Ability to process data and stated problems. Theoretical and practical knowledge acquired (quantitative evaluation, correctness, accuracy)	- formative assessment test (tests during the semester)	100%	50%
10.5a Seminar	Qualitative and quantitative evaluation of the portfolio of works (assignments) prepared by the student. Evaluation based on the oral responses provided by the student during the portfolio submission stage. The aim will be to verify the extent to which the student has assimilated the knowledge resulting from the preparation of the portfolio of works.	- Portfolio Assessment - Assessment of student responses to questions based on the content of the portfolio		50%
10.6 Passing requirements At least getting a grade of 5 in the seminar and at least getting a grade of 5 in the tests.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Radu LUPĂȘTEANU, PhD

Seminar instructor: Lecturer Radu LUPĂȘTEANU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Cătălin ONUȚU, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*

[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Managementul Proiectelor** **Project Management**			
2.1.2. Course code				CE316			
2.2 Lecture instructor				Lecturer Radu LUPĂȘTEANU, PhD			
2.3 Seminar instructor				Lecturer Radu LUPĂȘTEANU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DO

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar	1	3.3b laboratory		3.3c project		3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar	14	3.6b laboratory		3.6c project		3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	14
Additional research in the library, on specialised electronic platforms, and in the field	5
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	12
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	- Teaching activities at the faculty: blackboard, projector, other teaching equipment; - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the seminar[13]	- Teaching activities at the faculty: blackboard, projector, other teaching equipment; - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași

6. General objective of the course

Presenting and understanding the stages of a construction project. Methods for modelling, organizing, evaluating, programming and quality assurance of construction projects.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - Learns basic concepts regarding the content of technical documentations, for different stages of a construction project; - Learns basic concepts about organizing and managing the construction processes; - Learns about the elaboration of a technical documentation regarding the contracting, management, programming and organizing the construction works; - Learns about the evaluation of costs of construction works and projects; - Learns about different approaches of programming the specific activities of a construction project;
Skills	The student/ graduate: - Prepares technical documentation for different stages of a construction project; - Prepares technical documentations regarding the contracting, management, programming and organizing the construction works; - Prepares technical documentations regarding the quality assessment and approval of construction works.
Responsibility and autonomy	The student/ graduate: - Respects ethical principles, rules, and values in the correct and timely completion of professional tasks, by adopting a rigorous, efficient, and responsible work strategy and making informed decisions to solve problems; - Integrates into the work group and applies communication and collaboration techniques for effective work within multidisciplinary teams at various hierarchical levels; - Continuously seeks information and documentation in their field of activity by appropriately using effective lifelong-learning methods and techniques; - Develops professional projects in the field of engineering.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images, videos and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class.

The teaching method is based on practical examples specific to the construction industry. During the courses, site visits to ongoing construction projects may also be organized, with the purpose of presenting the studied concepts in a practical manner.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. **Definition of project management.** Short history. Definition. Specific field of project management and links with similar areas of interest. Organizational structures.	Interactive lecture, debates, explanations	2 hours
9.1.2. **Construction projects – structures, classification.** Definition. Classification. Involved factors		2 hours
9.1.3. **Construction project stages.** Life cycle stages of a construction project. Feasibility and design stage. Construction stage. Service stage. Post-utilization stage. Forms of contracting.		8 hours
9.1.4. **Cost estimation for construction projects.** Estimation methods. Project break-down. Construction costs. Life cycle cost.		4 hours
9.1.5. **Construction project programming.** Programming techniques. Use of software for programming the construction works.		4 hours
9.1.6. **Quality management requirements for construction projects.** Construction quality. Requirements, performances, legal provisions. Quality assurance and control.		4 hours
9.1.7. **Organizational structures, leadership styles, decision making models**		4 hours
Reading list for the lecture: 1. Radu Lupășteanu – Lecture Notes "Project Management" – annually updated. Electronic format is sent to students at the beginning of the semester 2. Law 10 – 1995, with subsequent amendments and modifications, regarding quality in construction 3. SR EN ISO 9001 – 2015 – Quality Management System. Requirements 4. Normative P130 – 2025 regarding the monitoring of operational performance of constructions 5. Lupășteanu Radu, Construction Management, Editura Gamma, 1997 6. Vlad Lupășteanu, Radu Lupășteanu, Cristina Cosma, Construction Project Management and Ecomics, Ed. Matei-Teiu Botez, 2021		

9.2a Seminar	Work methods[16]	Observations, allotted time
Assignment no. 1 Project stages Feasibility study. Master budget. Technical documentation. Procurement stage, contract stage.	Discussions, explanations, case studies, interpretation of results	4 hours
Assignment no. 2 Cost estimation for construction projects Project break-down and bill of quantities. Cost estimation. Cost progress estimates. Specialized software.		4 hours
Assignment no. 3 Project programming techniques Definition of the activities. Programming methods. Special reports and software.		4 hours
Assignment no. 4 Organization structure of the project Organization structure. Risk analysis.		2 hours
Reading list for the seminar: 1. Radu Lupășteanu – Seminar Notes "Project Management" – annually updated. Electronic format is sent to students at the beginning of the semester 2. Law 10 – 1995, with subsequent amendments and modifications, regarding quality in construction 3. SR EN ISO 9001 – 2015 – Quality Management System. Requirements 4. Normative P130 – 2025 regarding the monitoring of operational performance of constructions 5. Lupășteanu Radu, Construction Management, Editura Gamma, 1997 6. Vlad Lupășteanu, Radu Lupășteanu, Cristina Cosma, Construction Project Management and Ecomics, Ed. Matei-Teiu Botez, 2021		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Test	Completeness and accuracy of knowledge Ability to apply acquired skills Ability to process data and stated problems. Theoretical and practical knowledge acquired (quantitative evaluation, correctness, accuracy)	- formative assessment test (tests during the semester)	100%	50%
10.5a Seminar	Qualitative and quantitative evaluation of the portfolio of works (assignments) prepared by the student. Evaluation based on the oral responses provided by the student during the portfolio submission stage. The aim will be to verify the extent to which the student has assimilated the knowledge resulting from the preparation of the portfolio of works.	- Portfolio Assessment - Assessment of student responses to questions based on the content of the portfolio		50%
10.6 Passing requirements At least getting a grade of 5 in the seminar and at least getting a grade of 5 in the tests.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Radu LUPĂȘTEANU, PhD

Seminar instructor: Lecturer Radu LUPĂȘTEANU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Cătălin ONUȚU, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Termotehnica construcțiilor Building Thermotechnics**			
2.1.2. Course code				CE317			
2.2 Lecture instructor				Lecturer Laura DUMITRESCU, PhD			
2.3 Laboratory instructor				Lecturer Laura DUMITRESCU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DO

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar		3.3b laboratory	1	3.3c project		3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar		3.6b laboratory	14	3.6c project		3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	15
Additional research in the library, on specialised electronic platforms, and in the field	8
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	10
Assessment[8]	3
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	Building Materials, Physics, Civil Buildings, Environmental Engineering, Civil Constructions

5. Requirements

5.1 for the lecture[12]	- Computer, video projector, blackboard, specific teaching materials - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the laboratory[13]	- Equipment, specific laboratory techniques, computing technology, software packages - The work is carried out after the teaching/verification of theoretical knowledge

6. General objective of the course

*In the **Building Termotehnica** course, you will learn the fundamental principles of heat and moisture transfer in building elements, as well as the methods used to analyse and calculate the thermal behaviour of building envelopes.*

You will study the calculation methods for heat losses and gains, the thermal balance of buildings, and you will develop skills for energy-efficient design and ensuring thermal comfort in built spaces. In addition, you will apply thermos-technical principles in practical activities that include laboratory measurements, thermal infrared investigations, determination of material thermal conductivity, numerical modelling of thermal bridges, and evaluation of the indoor thermal comfort. The course supports the development of an integrated perspective on building energy performance and its role in sustainable development and the protection of the built environment.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - explains the fundamental processes of heat transfer by conduction, convection and radiation, as well as their applicability in construction; - identifies the climatic parameters and material characteristics relevant for thermal analysis; - assesses the thermal behavior of building elements in stationary and non-stationary regimes; - applies the 2D and 3D analysis methods of the thermal field and evaluates the influence of linear and point thermal bridges; - explains the notions of heat balance, heat losses and inputs, as well as the criteria for evaluating the energy requirement; - defines the mechanisms of moisture transfer and the relationship between the temperature field and the formation of condensation; - identifies the factors that influence the thermal comfort of the occupants and uses the methods for its evaluation
Skills	The student/ graduate: - calculates the unidirectional and corrected thermal resistances and transmittances of building elements, as well as average values for the entire building envelope; - determines heat losses and gains and performs the thermal balance of a building; - uses numerical calculation methods to analyse the thermal field and identify thermal bridges; - evaluates the thermal stability of rooms and building elements; - applies design criteria to ensure thermal comfort and reduce energy consumption in buildings; - proposes technical solutions to increase energy performance and reduce the risk of condensation or thermal discomfort
Responsibility and autonomy	The student/ graduate: - demonstrates a responsible attitude towards the efficient use of energy and towards the sustainable design of buildings; - promotes constructive solutions that contribute to thermal comfort, energy saving and environmental protection; - demonstrates critical thinking and rigor in the analysis and interpretation of the results of thermotechnical calculations; - works autonomously and collaborates effectively in interdisciplinary teams to integrate thermotechnical solutions into the design of sustainable buildings

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class and will conclude with a short application to consolidate the knowledge taught.

The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (experiments, demonstrations, modelling), as well as action-based methods, such as exercises, practical activities, problem-solving.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. **Introduction to building Termotehnica**: Brief review of fundamental terms. Heat transfer by conduction, convection and radiation	Interactive lecture, debates, explanations	2 hours
9.1.2. **Climate parameters**: Outdoor climate parameters. Indoor climate parameters		2 hours

9.1.3. **1D steady-state thermal behaviour of building components**: Standard R-value and standard U-value	Interactive lecture, debates, explanations	2 hours
9.1.4. **Insulating materials**: Characteristics of insulating materials. Thermal conductivity of building materials. Declared and design values		2 hours
9.1.5. **Heat transfer of elements through the ground**: Constructions with and without basement		2 hours
9.1.6. **Glazing system**: Classification. Thermal performance assessment		2 hours
9.1.7. **2D&3D steady-state heat transfer**: 2D thermal field computation. Linear and punctual thermal bridges. Thermal bridges correction. Thermal bridges free design; Average thermal resistance of the building envelope		4 hours
9.1.8. **Thermal balance of buildings**: Heat losses. Heat gains. Room/building heat balance. Global heat transfer coefficient per volume and influence factors. Decision making for thermal upgrading. Measures for thermal protection and energy conservation		4 hours
9.1.9. **Unsteady-state heat transfer**: Unsteady-state thermal behaviour of building components. Thermal assimilation coefficient. Thermal inertia. Thermal damping and thermal lagging. Thermal stability of rooms and envelope elements		2 hours
9.1.10. **Moisture transfer in construction elements**: The importance of the temperature field. Condensation zones in the building elements		3 hours
9.1.11. **Thermal comfort in buildings**: Human body heat transfer. Thermal comfort factors, criteria and levels. Local thermal discomfort		3 hours

Reading list for the lecture:

1. Dumitrescu, L., Ștefănescu, D.P. (2017). Building physics. Hygrothermics. Student's handbook, Ed. Societăţii Academice "Matei-Teiu Botez", ISBN 978-606-582-107-1, 194 pp.
2. Ștefănescu, D. P. (2014). Proiectarea higrotermică cu sau fără calculator, Ed. Societăţii Academice "Matei-Teiu Botez", ISBN 978-606-582-051-7, 521 pp.
3. Ștefănescu, D. P. (2010). Proiectarea higrotermică a clădirilor, Ed. Societăţii Academice "Matei-Teiu Botez", ISBN 978-973-8955-95-0, 297 pp.
4. Iordache, F. (2010). Termotehnica Construcțiilor. Ediția a 3-a, Ed. Matrix Rom, București.
5. xxx Mc 001-2022: Metodologie de calcul al performanţei energetice a clădirilor
6. xxx C107-1-2-3-4-5:2005: 1-Normativ privind calculul coeficienţilor globali de izolare termică la clădiri de locuit; 2-idem la clădiri; 3-Normativ privind calculul termotehnic al elementelor de construcţie ale clădirilor; 4-Ghid pentru calculul performanţelor termotehnice ale clădirilor de locuit; 5-Calculul termotehnic al elementelor de construcţie în contact cu solul
7. xxx Legea 372/2005 privind performanţa energetică a clădirilor (republicată în 2020)
8. Radu, A., Bliuc, I., Vasilache, M. (2003). Higrotermică aplicată, Ed. Soc. Academice "Matei-Teiu Botez", ISBN 973 7962 45 1

9.2b Laboratory	Work methods [17]	Observations, allotted time
9.2.1. Principles of laboratory measurements in building thermotechnics	Explanations, discussions, practical demonstrations, applications	1 hour
9.2.2. Measurement of the surface temperature of building elements		1 hour
9.2.3. Investigation of thermal behaviour of the building envelope elements by thermal infrared imaging		1 hour
9.2.4. Measurement of the thermal conductivity of building materials		1 hour
9.2.5. Numerical modeling of thermal bridges		1 hour
9.2.6. Calculation of the PMV and PPD indices		1 hour
9.2.7. Conclusions and discussions. Presentation of the results of laboratory activities		1 hour

Reading list for the laboratory:

1. Velicu, C. (2010), Îndrumar de laborator pentru fizica construcțiilor (vol.I și II), Ed. Societăţii Academice "Matei-Teiu Botez", ISBN 978-973-8955-85-1
2. Iordache, F. (2010). Termotehnica Construcțiilor. Ediția a 3-a, Ed. Matrix Rom, București
3. xxx C107-1-2-3-4-5:2005: 1-Normativ privind calculul coeficienţilor globali de izolare termică la clădiri de locuit; 2-idem la clădiri; 3-Normativ privind calculul termotehnic al elementelor de construcţie ale clădirilor; 4-Ghid pentru calculul performanţelor termotehnice ale clădirilor de locuit; 5-Calculul termotehnic al elementelor de construcţie în contact cu solul

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Test	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity	- formative assessment test (tests during the semester)	50%	50% (min. 5)
		- summative assessment test (final assessment)	50%	

	Level of command of specialised terminology and communication skills Ability to apply acquired skills Ability to process data and solve the problems presented			
10.5b Laboratory	Ability to work in a team. Ability to apply acquired knowledge in practice in different contexts. Capacity for analysis, personal interpretation, originality, and creativity	- completion of laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		50% (min. 5)
10.6 Passing requirements The student must demonstrate at least the ability to explain the basic principles of heat and moisture transfer through building elements, perform simple thermotechnical calculations, and correctly interpret basic results on thermal behaviour and thermal comfort.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Laura DUMITRESCU, PhD

Project instructor Lecturer Laura DUMITRESCU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Ioana - Sorina ENȚUC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Fizica construcțiilor** **Building Phisycs**			
2.1.2. Course code				CE317			
2.2 Lecture instructor				Lecturer Claudiu ROMILA, PhD			
2.3 Laboratory instructor				Lecturer Claudiu ROMILA, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DO

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar		3.3b laboratory	1	3.3c project		3.3.d practical sessions		
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar		3.6b laboratory	14	3.6c project		3.6.d		

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	15
Additional research in the library, on specialised electronic platforms, and in the field	8
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	10
Assessment[8]	3
Other activities:	

3.7 Total number of individual study hours[9]	33
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	Not applicable
4.2 Learning outcomes prerequisites	Building Materials, Physics, Civil Buildings, Environmental Engineering, Civil Constructions

5. Requirements

5.1 for the lecture[12]	- Computer, video projector, blackboard, specific teaching materials - Students will respect the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iași
5.2 for the laboratory[13]	- Equipment, specific laboratory techniques, computing technology, software packages - The work is carried out after the teaching/verification of theoretical knowledge

6. General objective of the course

In the Building Physics discipline, you will study and apply physical principles (such as heat transfer, acoustics, natural lighting, and water vapour transfer) to buildings and their components. The goal is to ensure the thermal, visual,

and acoustic comfort of the occupants, energy efficiency, and structural durability. You will understand and apply the principles of building physics through practical activities that include laboratory measurements. Thus, you will learn the principles of laboratory measurements and the processing of experimental data, taking into account measurement errors. This course contributes to forming an integrated vision of building occupancy, indoor comfort, and the satisfaction of essential construction requirements related to C. Hygiene, health, and environment; E. Protection against noise; and F. Energy economy and heat retention.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - explains the fundamental processes of heat transfer by conduction, convection and radiation and their applicability in construction; - identifies the climatic parameters and material characteristics relevant for thermal analysis; - evaluates correctly the sources of moisture in buildings and their effect on building materials; - identifies the factors that influence the occupants' thermal comfort and use the methods for its evaluation; - knows the performance criteria related to ventilation and its influence on the indoor microclimate; - identifies correctly the sources of noise in buildings, the modes of noise propagation, and noise protection measure; - identifies the correct solutions for achieving natural lighting for spaces with various destinations and geometry
Skills	The student/ graduate: - calculates the unidirectional and corrected thermal resistances (R) and thermal transmittances (U) of building elements; - determines heat losses and gains and performs the thermal balance of a building; - uses numerical calculation methods to analyse the thermal field and identify thermal bridges; - evaluates the thermal stability of rooms and building elements; - applies design criteria to ensure thermal comfort and reduce energy consumption in buildings; - proposes technical solutions to increase energy performance and reduce the risk of condensation or thermal discomfort
Responsibility and autonomy	The student/ graduate: - demonstrates a responsible attitude towards the importance of designing buildings to satisfy the essential requirements in construction that directly influence indoor comfort; - promotes construction solutions that contribute to air quality, energy saving, and noise reduction; - demonstrates critical thinking and rigor in conducting laboratory measurements; - works autonomously and collaborates effectively in interdisciplinary teams o integrate solutions related to indoor air quality into building design

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations that will be made available to students. The presentations contain images and diagrams, so that the information could be easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous class and will conclude with a short application to consolidate the knowledge taught.

The teaching approach uses discovery-based learning models, facilitated by direct and indirect exploration of reality (experiments, demonstrations, modelling), as well as action-based methods, such as exercises, practical activities, problem-solving.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. **Introduction**: Course objective, the human-building-environment relationship, performance requirements, the concept of comfort	Interactive lecture, debates, explanations	2 hours
9.1.2. **Design climate parameters**: outdoor design temperature, climate change, the urban heat island effect		2 hours
9.1.3. **Heat Transfer in Buildings**: Fundamental modes of heat transfer, heat transfer through building elements separating environments with different temperatures		2 hours

9.1.4. **Building elements under steady-state thermal conditions**: Thermal resistance of homogeneous and non-homogeneous building elements, the thermal field on the surface and within the structure of building elements, determination methods	Interactive lecture, debates, explanations	2 hours
9.1.5. **Building Elements and buildings under variable thermal conditions**: Characteristics of materials and building elements, thermal inertia of rooms, the effect on indoor climate and on energy consumption for heating and cooling		2 hours
9.1.6. **Air humidity and water vapour condensation**: Sources of moisture in buildings, characteristics of humid air, water vapour condensation on the surface and within the structure of building elements, the effects of condensation, prevention measures		3 hours
9.1.7. **Hygothermal design elements of the building envelope**: Energy conservation and satisfaction of comfort requirements, criteria and performance levels regarding energy consumption for residential and non-residential buildings		4 hours
9.1.8. **Natural ventilation of buildings**: The role of ventilation, performance criteria, determining factors, ventilation strategies, practical implementation of natural and mechanical ventilation, the influence of ventilation on the microclimate		3 hours
9.1.9. **Acoustics of buildings**: Fundamental notions, sounds and noises, noise and acoustic comfort, sound as a physical phenomenon, defining the acoustic field, sound propagation in open spaces, acoustic protection against airborne and impact noise, noise mitigation measures, elements of room acoustics		4 hours
9.1.10. **Natural lighting of buildings**: General notions of photometry, perception of light and color, visual comfort, criteria and performance levels regarding natural lighting, practical implementation of natural lighting for spaces with different destinations, protection of buildings from solar radiation		4 hours

Reading list for the lecture:

1. Romila, C. (2020). Higrotermica și acustica clădirilor – note de curs, https://edu.tuiasi.ro/mod/folder/view.php?id=14580
2. Ștefănescu, D. P., Proiectarea higrotermica a cladirilor, Editura Matei-Teiu Botez", Iaşi, 2010;
3. xxx Mc 001-2006: Metodologie de calcul al performanţei energetice a clădirilor;
4. xxx C107-1-2-3-4-5:2005: 1-Normativ privind calculul coeficienţilor globali de izolare termică la clădiri de locuit; 2-idem la clădiri; 3-Normativ privind calculul termotehnic al elementelor de construcţie ale clădirilor; 4-Ghid pentru calculul performanţelor termotehnice ale clădirilor de locuit; 5-Calculul termotehnic al elementelor de construcţie în contact cu solul
5. xxx Legea 372 / 2005: Performanţele energetice ale clădirilor;
6. Radu, A., Bliuc, I., Vasilache, M., Higrotermică aplicată, Editura Matei-Teiu Botez", Iaşi, 2003, ISBN 973 7962 45 1;
7. Radu, A., Secu, Al., Bliuc, I. and Co., Satisfacerea exigenţelor de izolare termică şi conservare a energiei în construcţii. Editura "Matei-Teiu Botez", Iaşi, 2003, ISBN 973 8588 27 8

9.2b Laboratory	Work methods [17]	Observations, allotted time
9.2.1. Principles of laboratory measurements in building physics	Explanations, discussions, practical demonstrations, applications	1 hour
9.2.2. Temperature measurements: Measuring air and surface temperatures using various types of instruments		1 hour
9.2.3. Humidity Measurement: Measuring the humidity of the air and of building materials		1 hour
9.2.4. Measurement of room ventilation capacity: Determining the ventilation rate (air change rate) of rooms		1 hour
9.2.5. Assessment of acoustic insulation: Establishing the degree of sound insulation against airborne noise transmission for a building element		1 hour
9.2.6. Measurement of room lightning conditions: Measuring illuminance at a point and determining the average illuminance on the general working plane in a room		1 hour
9.2.7. Conclusions and discussions. Presentation of the results of laboratory activities		1 hour

Reading list for the laboratory:

1. Velicu, C. (2010), Îndrumar de laborator pentru fizica construcțiilor (vol.I și II), Ed. Societăţii Academice "Matei-Teiu Botez", ISBN 978-973-8955-85-1
2. Iordache, F. (2010). Termotehnica Construcțiilor. Ediția a 3-a, Ed. Matrix Rom, București
3. xxx C107-1-2-3-4-5:2005: 1-Normativ privind calculul coeficienţilor globali de izolare termică la clădiri de locuit; 2-idem la clădiri; 3-Normativ privind calculul termotehnic al elementelor de construcţie ale clădirilor; 4-Ghid pentru calculul performanţelor termotehnice ale clădirilor de locuit; 5-Calculul termotehnic al elementelor de construcţie în contact cu solul

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Test	Completeness and accuracy of knowledge	- formative assessment test (tests during the semester)	50%	50% (min. 5)

	Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- summative assessment test (final assessment)	50%	
10.5b Laboratory	Ability to work in a team. Ability to apply acquired knowledge in practice in different contexts. Capacity for analysis, personal interpretation, originality, and creativity	- completion of laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		50% (min. 5)
10.6 Passing requirements The student must demonstrate the ability to explain the basic principles of building physics and laboratory measurements, to perform elementary calculations, and to correctly interpret the results of simple measurements within the field of building physics.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Claudiu ROMILA, PhD

Project instructor Lecturer Claudiu ROMILA, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Ioana - Sorina ENȚUC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC)*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstrations, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025 - 2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Limbaje de programare - MATLAB** **Programming Languages - MATLAB**			
2.1.2. Course code				CE318			
2.2 Lecture instructor				Lecturer Gabriela COVATARIU, PhD			
2.3 Laboratory instructor				Lecturer Gabriela COVATARIU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DL

3. Estimated total time (hours per semester)

3.1 Number of hours per week	4	3.2 lecture	1	3.3a seminar		3.3b laboratory	3	3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	56	3.5 lecture	14	3.6a seminar		3.6b laboratory	42	3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	6
Additional research in the library, on specialised electronic platforms, and in the field	6
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	7
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	19
3.8 Total number of hours per semester[10]	75
3.9 Number of ECTS credits	3

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	General knowledge of computer programming

5. Requirements

5.1 for the lecture[12]	- Applied activities in physical format, at the faculty headquarters: computer technology, software packages, experimental stands, etc. - Students will comply with the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iasi
5.2 for the laboratory[13]	- Applied activities in physical format, at the faculty headquarters: computer technology, software packages, experimental stands, etc. - The deadlines for the submission of the papers are established by the tenured professors and are sent to the students at the beginning of the semester - Students will comply with the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iasi

6. General objective of the course

This course aims to train the ability to design, develop and implement custom algorithmic solutions in MATLAB, to solve, automate and optimize complex problems in civil engineering. The student will transform theoretical knowledge into practical tools for calculation, simulation, and analysis, becoming able to create effective software tools that increase accuracy, productivity, and innovation in professional or research activity.

7. Learning outcomes[14]

Knowledge	The Student/ Graduate will gain advanced knowledge of: - The MATLAB programming environment and its toolboxes applicable in civil engineering (data processing, simulation, optimization); - Field-specific numerical modeling techniques; - Ways to integrate and exchange data between MATLAB and other CAD/ FEM software used in the industry
Skills	The Student/ Graduate will be able to: - use digital tools for seminar work and the creation and presentation of the final paper; - plans data collection and understands the use of different sampling methods and analysis methods; - checks and cleans data for proper analysis; - critically evaluates the methods of data collection and analysis, the use of computer tools and the results of the analysis results
Responsibility and autonomy	The Student/ Graduate will be able to: - Automate repetitive engineering calculations (e.g., structural sizing, reports) through robust scripts and functions; - Analyze and visualize large experimental or monitoring datasets with complex 2D/ 3D graphs; - Simulate structural processes or behaviours using custom numerical algorithms; - Optimize design solutions (shapes, materials, costs) using MATLAB's dedicated features and toolboxes.

8. Teaching strategies

In the teaching activity, participatory lectures and debates will be used based on Power Point presentations that will be made available to students on the *edu.tuiasi.ro platform.* The presentations contain images, sketches, videos, so that the information is easy to understand and assimilate.

The teaching method is also based on models of learning by discovery facilitated by direct and indirect exploration of reality (experiment, demonstration, modelling), but also on action-based methods, such as exercise, practical activities and problem solving.)

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Using Programming Environments in Solving Scientific and Engineering Problems - Matlab - Understanding programming environments and their use by students and engineers - Elementary operations with matrices in Matlab - Programming principles and basic instructions in Matlab - Programmed graphics in Matlab	Interactive lecture, debates, explanations	2 hours
9.1.2. Basic commands in Matlab - repetitive decision instructions - data import/export instructions - elementary data types: constants and variables - functions; graphs		6 hours
9.1.3. Matlab - Toolbox-uri, Simulink		2 hours
9.1.4. Exemple de probleme din ingineria civila rezolvate cu ajutorul Matlab-ului		4 hours

Reading list for the lecture:

1. M. Ghinea, V. Fireţeanu, Matlab. Calcul numeric – grafică – aplicaţii, Editura Teora, Bucureşti, 2008
2. Matlab – Documentație pachet programe http://www.mathworks.com/
3. Turk I. – MATLAB Programming for Beginners and Professionals, CreateSpace Independent Publishing Platform, 2018
4. B. Hahn, B., Valentine D. – Essential Matlab for Engineer and Scientist, Elsevier, 2019
5. Chapman S.J. – MATLAB Programming for Engineers, Cengage Learning, 2019

9.2b Laboratory	Work methods[16]	Observations, allotted time
9.2.1. Using Programming Environments in Solving Scientific and Engineering Problems – Matlab: - A recapitulation of the main facilities offered by the programming environment in Matlab is made: methods of making arrays, elementary operations with matrices, basic instructions in the Matlab language, how to compose, store and launch programs in work, instructions for graphics programmed in Matlab, files. M	Interactive lecture, debates, explanations, practice work, examples	2 hours
9.2.2. Algorithms and logical schemes – recap		3 hours
9.2.3. Types of elementary data. Variable and constant. 1. Type Conversions, Arithmetic Expressions, Logical Expressions; 2. Decision commands if, switch; 3. Repetitive commands for, while; 4. Entry/ exit operations on elementary data. input /output, load, save, fprint, sprint; 5. Functions; 6. Charts		22 hours
9.2.4. Toolbox library views, Simulink. Problem solving		3 hours
9.2.5. Civil engineering problem solving solved with the help of Matlab		6 hours
9.2.6. Preparation of colloquium + colloquium paper - problems with applicability in civil engineering		6 hours
Reading list for the laboratory: 1. M. Ghinea, V. Fireţeanu, Matlab. Calcul numeric – grafică – aplicaţii, Editura Teora, Bucureşti, 2008 2. Matlab – Documentație pachet programe http://www.mathworks.com/ 3. Turk I. – MATLAB Programming for Beginners and Professionals, CreateSpace Independent Publishing Platform, 2018 4. B. Hahn, B., Valentine D. – Essential Matlab for Engineer and Scientist, Elsevier, 2019 5. Chapman S.J. – MATLAB Programming for Engineers, Cengage Learning, 2019		

10. Assessment

Assessment category	**10.1 Assessment criteria**	**10.2 Assessment method**		**10.3 Percentage of final grade**
10.4 Final tests	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of assimilation of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- systematic observation of students (individual assignments – which must be completed during the week between lectures, preparation of a report, case study) - presentation of the project by each student	50%	50%
		- summative assessment test (final assessment)	50%	
10.5b Laboratory	Laboratory activity – Ability to work in a team, Ability to apply in practice, in different contexts, the knowledge learned. Ability to analyze, personal interpretation, originality, creativity	- making laboratory sheets (all laboratory work must be performed, admitting the recovery of only one outstanding laboratory work); - evaluation test (laboratory colloquium).		50%
10.6 Passing requirements				
For the final evaluation, the student must demonstrate the choice and correct approach to analyze a civil engineering problem and solve it by creating programs in MATLAB. The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Gabriela COVATARIU, PhD

Laboratory instructor: Lecturer Gabriela COVATARIU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGHIAC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 27 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025 - 2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Civil Engineering and Building Services
1.3 Department	Structural Mecanics
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor
1.6. Study programme	Civil Engineering

2. Course information

2.1.1 Course title				**Abilități de leadership** **Leadership Skills**			
2.1.2. Course code				CE319			
2.2 Lecture instructor				Lecturer Gabriela COVATARIU, PhD			
2.3 Laboratory instructor				Lecturer Gabriela COVATARIU, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DL

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	1	3.3a seminar		3.3b laboratory	2	3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	14	3.6a seminar		3.6b laboratory	28	3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	2
Additional research in the library, on specialised electronic platforms, and in the field	4
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	2
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	8
3.8 Total number of hours per semester[10]	50
3.9 Number of ECTS credits	2

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	- Applied activities in physical format, at the faculty headquarters: computer technology, software packages, experimental stands, etc.; - The deadlines for the submission of the papers are established by the tenured professors and are sent to the students at the beginning of the semester; - Students will comply with the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iasi;
5.2 for the laboratory[13]	- Applied activities in physical format, at the faculty headquarters: computer technology, software packages, experimental stands, etc.; - The deadlines for the submission of the papers are established by the tenured professors and are sent to the students at the beginning of the semester; - Students will comply with the Code of Student Rights and Obligations and the Regulations provided by the Charter of the "Gheorghe Asachi" Technical University of Iasi

6. General objective of the course

This course studies the leadership styles, skills, roles, and functions of organizational leaders. Students will acquire a broad development of the history and origins of leadership, theoretical approaches to leadership, and the ethical issues faced by contemporary leaders. Students will also develop a personal philosophy of leadership, an awareness of the moral and ethical responsibilities of leadership, and an awareness of one's own leadership style. This course integrates readings from the humanities, classic works of literature, contemporary multicultural writings, and experiential learning exercises with readings and discussions of traditional theories of leadership.

7. Learning outcomes[14]

Knowledge	The Student/ Graduate: - will accumulate the theoretical foundation (knowledge) about what it means to be a leader, and through practical exercises and reflection;
Skills	The Student/ Graduate will: - develops the applied capacity (skills) to lead people and achieve results together with them;
Responsibility and autonomy	The Student/ Graduate will: - respects the principles, norms, and values of ethics in the correct and timely execution of professional tasks, by approaching a rigorous, efficient, and responsible work strategy in decision-making for problem solving; - integrate into the working group and applies techniques of relationship and efficient work in multidisciplinary teams, on various hierarchical levels; - be permanently informed and documented in his/her own field of activity through the appropriate use of effective methods and techniques of lifelong learning; - develops professional projects in the field of engineering.

8. Teaching strategies

In the teaching activity, participatory lectures and debates will be used based on Power Point presentations that will be made available to students on the edu.tuiasi.ro platform. The presentations contain images, sketches, videos, so that the information is easy to understand and assimilate.

The teaching method is also based on models of learning by discovery facilitated by direct and indirect exploration of reality (experiment, demonstration, modelling), but also on action-based methods, such as exercise, practical activities and problem solving.)

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. What is Leadership? Management vs. Leadership, Power & Leadership	Interactive lecture, debates, explanations	4 hours
9.1.2 Theories of Leadership		4 hours
9.1.3. Leader: Power and Influence		2 hours
9.1.4. Leadership, ethics, and values		2 hours
9.1.5. Leadership traits, leadership skills, leadership styles/ behaviours		2 hours
9.1.6. Motivation, satisfaction, and performance		2 hours
9.1.7. Groups, teams, and their leadership		4 hours
9.1.8. Focus on the situation. Critical thinking		2 hours
9.1.9. Leadership and change		2 hours
9.1.10. The Dark Side of Leadership		2 hours
Reading list for the lecture: 1. Northouse P - Leadership_ Theory and Practice, 2018 2. Kouzes J. and Posner B. - The Student Leadership Challenge: Five Practices of Exemplary Leaders, 2016 3. Hess D. - Leadership by engineers and scientists' professional skills needed to succeed in a changing world, 2018		
9.2b Laboratory	Work methods[16]	Observations, allotted time
9.2.1. Case studies	Interactive lecture, debates, explanations, practice work	20 hours
9.2.2. Group work projects		8 hours

Reading list for the laboratory:
1. 1. 1. Northouse P - Leadership_ Theory and Practice, 2018
2. Kouzes J. and Posner B. - The Student Leadership Challenge: Five Practices of Exemplary Leaders, 2016
3. Hess D. - Leadership by engineers and scientists' professional skills needed to succeed in a changing world, 2018

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final tests	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of assimilation of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- systematic observation of students (individual assignments – which must be completed during the week between lectures, preparation of a report, case study) - presentation of the project by each student	50%	50%
		- summative assessment test (final assessment)	50%	
10.5b Laboratory	Laboratory activity – Ability to work in a team, Ability to apply in practice, in different contexts, the knowledge learned Ability to analyze, personal interpretation, originality, creativity	- making laboratory sheets (all laboratory work must be performed, admitting the recovery of only one outstanding laboratory work); - evaluation test (laboratory colloquium).		50%
10.6 Passing requirements				
For the final evaluation, the student must demonstrate an understanding of leadership skills and their importance. Students will present various examples/cases of leadership. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Lecturer Gabriela COVATARIU, PhD

Laboratory instructor: Lecturer Gabriela COVATARIU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGHIAC, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

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[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 27 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Limba engleză avansați** **Advanced English Language**			
2.1.2. Course code				CE320			
2.2 Lecture instructor(s)				N/A			
2.3 Seminar instructor				Lecturer Lucia-Alexandra TUDOR, Dr.			
2.4 Year of study[2]	3	2.5 Semester[3]	5	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DL

3. Estimated total time (hours per semester)

3.1 Number of hours per week	2	3.2 lecture		3.3a seminar	2	3.3b laboratory		3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	28	3.5 lecture		3.6a seminar	28	3.6b laboratory		3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	5
Additional research in the library, on specialised electronic platforms, and in the field	7
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	10
Assessment[8]	2
Other activities:	

3.7 Total number of individual study hours[9]	22
3.8 Total number of hours per semester[10]	50
3.9 Number of ECTS credits	2

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	
5.2 for the seminar[13]	Blackboard/whiteboard, video projector, dictionaries

6. General objective of the course

The course aims to consolidate and further develop the students' English-language communication skills in accordance with the Common European Framework of Reference for Languages (CEFR), with a particular focus on advanced written and oral communication in a technical university context. Emphasis is placed on the reception and production of complex messages in English across social, academic, professional, and technical domains. The course seeks to strengthen linguistic competence through the accurate and context-appropriate use of specialized vocabulary,

advanced grammatical structures, and discursive and pragmatic strategies, enabling students to communicate effectively and collaborate confidently with both native and non-native speakers in academic and professional settings.

7. Learning outcomes[14]

Knowledge	The student/ graduate: - understands and explains advanced grammatical structures, discourse patterns, and pronunciation features specific to professional and technical English; - distinguishes and applies general and specialized vocabulary, relevant to technical and professional contexts; - understands and applies principles of scientific writing, research communication, and source evaluation in English; - understands communication strategies appropriate to formal, semi-formal, and professional interaction in multicultural and multilingual environments.
Skills	The student/ graduate: - produces clear, coherent, and well-structured written texts in English (scientific, technical, and professional), adapted to purpose, audience, and context; - delivers technical explanations using appropriate language, visuals, and discourse strategies. - participate effectively in professional interactions (meetings, emails, calls), demonstrating pragmatic awareness and register control; - interprets, summarizes, and reformulates technical and scientific information from English-language sources; - applies research, terminology management, and translation/mediation skills to support academic and professional communication tasks.
Responsibility and autonomy	The student/ graduate: - shows responsibility in applying the language skills acquired in academic and professional contexts; - assumes autonomy in learning and continuously improving the English language; - demonstrates the ability to organize and manage writing and presentation tasks in English individually; - collaborates effectively in teams, assuming various roles and responsibilities in joint projects; - shows initiative and adaptability in intercultural communication situations; - responsibly integrates linguistic and cultural resources in the learning process and in professional development; - adapts their communication strategies to new or unfamiliar professional situations, including interdisciplinary and international contexts

8. Teaching strategies

The course employs an interactive and learner-centred approach, combining guided practice, task-based activities, and project work. Teaching strategies include individual and group tasks, simulations of professional and academic communication, presentations, peer feedback, and the use of authentic materials relevant to technical and scientific contexts.

9. Content

9.2a Seminar	Work methods[16]	Observations, allotted time
9.2a.1. Advanced pronunciation and intelligibility: Stress, rhythm, clarity in academic and professional speech	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.2. Presenting facts, figures, and trends; data commentary; describing charts and tables		2 hours
9.2a.3. Technical explanations and rephrasing strategies: Simplifying vs. formalizing explanations		2 hours
9.2a.4. Cohesion and coherence; advanced connectors; structuring arguments.		2 hours
9.2a.5. Describing properties. Comparison and contrast. Evaluative language in technical contexts		2 hours
9.2a.6. Research skills: Sources and credibility. Identifying, evaluating, and citing scientific sources		2 hours
9.2a.7. Scientific writing I: Structure and style. Abstracts, introductions, tone, objectivity		2 hours
9.2a.8. Scientific writing II: Argumentation and clarity. Hedging, defining scope, avoiding overgeneralization		2 hours

9.2a.9. Requests, clarifications, politeness strategies	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.10. Professional interaction: Telephone and online communication. Requests, clarifications, politeness strategies		2 hours
9.2a.11. Technical texts; reformulation across registers.		2 hours
9.2a.12. Professional email writing I: Register and intent. Formal vs. semi-formal contextes		2 hours
9.2a.13. Professional email writing II: Complex messages. Requests, refusals, explanations.		2 hours
9.2a.14. Assessment		2 hours

Reading list for the seminar:

1. Braun, Kathryn, Kitty O. Locker, Stephen Kyo Kaczmarek, Business Communication: Building Critical Skills, McGraw-Hill Education, 2016
2. Emerson, Paul, Email English, Oxford, Macmillan, 2004
3. English, Jane, Sally Burt, Gabi Nudelman, Professional Communication: Deliver Effective Written, Spoken and Visual Messages, Juta, 2017
4. Hanson, Adrian, Jenny Dooley, Civil Engineering, Express Publishing, 2019
5. Ibbotson, Mark, Cambridge English for Engineering, Cambridge, Cambridge University Press, 2008
6. Literat, Ruxanda (ed.), Teste de competenţă lingvistică, Cluj-Napoca, U. T. Press, 2024
7. Marsen, Sky, Professional Writing, Red Globe Press, 2020
8. McCarthy, Michael, Felicity O'Dell, English Collocations in Use - Advanced, Cambridge University Press, 2017

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Continuous Assessment	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity Level of command of specialised terminology and communication skills Ability to apply acquired skills	- summative assessment test (final assessment)	100%	50%
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities		50%

10.6 Passing requirements

Minimum grade of 5 (five) in both the summative assessment test and in the evaluation of the seminar activity. The student is able to understand and produce oral and written messages in English on professional and technical topics related to civil engineering. The student is able to write texts (e-mails, technical descriptions) correctly using fundamental grammatical structures and essential vocabulary. In oral interaction, the student is able to participate in conversations and discussions, to express opinions and to formulate questions in a professional manner, and to present technical data.

The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.

Date of completion: September 2025

Lecture instructor: -

Seminar instructor: Lecturer Lucia-Alexandra TUDOR, Dr.

Date of departmental approval:
September 2025

Head of Department,
Associate Professor Gabriel ASANDULUI, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
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2.3 Seminar instructor				Lecturer Lucia-Alexandra TUDOR, Dr.			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	Vp	2.7 Course type[5]	DL

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9. Content

9.2a Seminar	Work methods[16]	Observations, allotted time
9.2a.1. Instructions, regulations, and standards: Modal verbs, precision, risk language.	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.2. Industrial hazards and safety communication. Warnings; procedures.		2 hours
9.2a.3. Describing technical requirements and constraints. Offering suggestions; negotiating solutions		2 hours
9.2a.4. Work meetings and professional interaction: Turn-taking, agreement, disagreement		2 hours
9.2a.5. Delivering a professional presentation: Structure, visuals, audience engagement.		2 hours
9.2a.6. Design phases and problem-solving discourse. Explaining decisions; justifying choices		2 hours
9.2a.7. Technical problems and fault analysis. Diagnosing issues; proposing solutions		2 hours
9.2a.8. Advanced professional communication: Case-based discussions		2 hours
9.2a.9. Terminology management I: Purpose, methods, sources		2 hours
9.2a.10. Terminology management II: Building and using specialized glossaries		2 hours
9.2a.11. Career communication I: CVs and applications. Academic vs. industry focus		2 hours

9.2a.12. Career communication II: Interviews. Competency-based answers	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.13. Technical writing: Genres and conventions. Reports, manuals, specifications		2 hours
9.2a.14. Assessment		2 hours

Reading list for the seminar:

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2. English, Jane, Sally Burt, Gabi Nudelman, Professional Communication: Deliver Effective Written, Spoken and Visual Messages, Juta, 2017
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10.6 Passing requirements Minimum grade of 5 (five) in both the summative assessment test and in the evaluation of the seminar activity. The student is able to understand and produce oral and written messages in English on professional and technical topics related to civil engineering. The student is able to write technical and professional documents correctly using fundamental grammatical structures and essential vocabulary. In oral interaction, the student is able to participate in conversations and discussions, to express opinions and to formulate questions in a professional manner.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: -

Seminar instructor: Lecturer Lucia - Alexandra TUDOR, Dr.

Date of departmental approval: September 2025

Head of Department,
Associate Professor Gabriel ASANDULUI, PhD

Date of faculty council approval: September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
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[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*

FIŞA DISCIPLINEI

Anul universitar 2025 – 2026

1. Date despre program

1.1 Instituția de învăţământ superior	Universitatea Tehnică „Gheorghe Asachi” din Iaşi
1.2 Facultatea	
1.3 Departamentul	Departamentul pentru Pregătirea Personalului Didactic
1.4 Domeniul de studii	Științe ale educației
1.5 Ciclul de studii[1]	Licență
1.6. Programul de studii	Program de formare psihopedagogică

2. Date despre disciplină

2.1.1 Denumirea disciplinei				**Instruire asistată de calculator Computer Assisted Training**			
2.1.2. Codul disciplinei				CE321			
2.2 Titularul/ titularii activităţilor de curs				Conf. univ. dr. Tudor STANCIU			
2.3 Titularul/ titularii activităţilor de aplicaţii (S, L, P, Pr)				Conf. univ. dr. Tudor STANCIU			
2.4 Anul de studii[2]	3	2.5 Semestrul[3]	5	2.6 Tipul de evaluare[4]	C	2.7 Tipul disciplinei[5]	DL

3. Timpul total estimat al activităţilor zilnice (ore pe semestru)

3.1 Număr de ore pe săptămână	2	3.2 curs	1	3.3a sem.	1	3.3b laborator	-	3.3c proiect	3.3.d practică	
3.4 Total ore din planul de învăţământ[6]	28	3.5 curs	14	3.6a sem.	14	3.6b laborator	-	3.6c proiect	3.6.d	

Distribuția fondului de timp[7]	Nr. ore
Studiul după manual, suport de curs, bibliografie şi notițe	5
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate şi pe teren	7
Pregătire seminarii/laboratoare/proiecte, teme, referate şi portofolii	10
Examinări[8]	6
Alte activităţi:	-

3.7 Total ore studiu individual[9]	22
3.8 Total ore pe semestru[10]	50
3.9 Numărul de credite	2

4. Precondiții (acolo unde este cazul)

4.1 de curriculum[11]	Promovarea disciplinelor de Psihologia educației, Pedagogie I, Pedagogie II, Didactica specializării
4.2 de rezultate ale învățării	Rezultate ale învățării specifice disciplinelor Psihologia educației, Pedagogie I, Pedagogie II, Didactica specializării

5. Condiţii

5.1 de desfăşurare a cursului[12]	- Tablă inteligenta, videoproiector, materiale didactice - Atunci când se impune, cursurile se vor efectua online (pe platformă educațională Google Meet).
5.2 de desfăşurare a seminarului	- Mijloace de învățământ specifice pentru desfășurarea seminariilor fizic și/ sau online

6. Obiectivul general al disciplinei

Familiarizarea cu aspecte ale instruirii asistate de calculator în rolul de profesor de specialitate.

7. Rezultatele învățării[14]

Cunoștințe	Studentul/ Absolventul - Cunoaşte, înţelege si utilizeaza limbajul de specialitate; - Cunoaște si utilizeaza modele de învăţare şi de livrare a lecţiilor cu ajutorul calculatorului; - Corelează cunoștințele de specialitate, psihopedagogice, în realizarea activităţilor instructiv-educative din învățământ și a altor activități educaționale cu ajutorul calcultaorului; - Argumentează potențialul formativ al teoriilor, principiilor și practicilor specifice domeniului
Aptitudini	Studentul/ Absolventul: - Aplica practic conceptele învăţate; - Realizeaza lecții, tutoriale, simulari, etc. cu ajutorul calculatorului; - Construiește contexte de învățare autentică, în manieră integrată, în care elevii își valorifică experiențele de viață și interesele de cunoaștere
Responsabilitate și autonomie	Studentul/ Absolventul: - Executa responsabil sarcinile profesionale, în condiţii de autonomie restrânsă şi asistență calificată; - Dezvoltă atitudini creatoare și constructive în aplicarea principiilor instruirii asistate de calculator; - Indică necesitatea utilizării unor resurse variate pentru eficientizarea predării, susținerea învățării și sprijinirea elevilor în folosirea lor autonomă; - Comunică eficient prin oferirea de feedback constructiv și susține implicarea activă a elevilor în propriul proces de învățare

8. Metode de predare

În activitatea de predare vor fi utilizate metode didactice diverse, cum ar fi: prelegerea, explicația, descrierea, conversația, discuția colectivă, problematizarea.

9. Conţinuturi

9. 1. Curs[15]	**Metode de predare**	**Timp alocat**
I. Învăţământ asistat de calculator. Scurt istoric, definiţie, terminologie. Introducerea tehnologiei în şcoală şi instruirea cu ajutorul calculatorului. Avantaje şi inconveniente. Exemple de proiecte de învăţare la distanţă	Prelegere interactivă, discuții, explicații, comunicarea euristică, studiul de caz	2 ore
II. Modele de învăţare şi de livrare a lecţiilor cu ajutorul calculatorului. Tutoriale, exerciţii, simulări, jocuri educative, situri Web. Tehnologia informatică utilizată pentru proiectarea acestora. Modelul clasei deschise şi al învăţării în reţea. Videoconferinţa şi instruirea on-line		2 ore
III. Programe educaţionale, universităţi virtuale, proiecte de învăţare la distanţă, publicaţii Web de (auto) instruire. Performanţă obţinută cu ajutorul cursurilor on-line		2 ore
IV. Excurs istoric asupra Internetului. Conceptul de hipertext. Regăsirea informaţiilor pe Web cu ajutorul motoarelor de căutare. Portaluri educaţionale		1 oră
V. Proiectarea paginilor Web si a tutorialelor. Componentele unei pagini Web educaţionale. Principii de organizare şi de design. Utilizarea aplicaţiilor 1stpage şi FrontPage Express în crearea de pagini Web. Proiectarea unui curs on-line. Prezentarea materialului, organizarea unui forum de discuţii, preluarea răspunsurilor la întrebări		2 ore
VI. Educația si paradigma insecurității cibernetice. Cetățenia cibernetică. Psihologia ingineriei sociale		3 ore
VII. Metode de evaluare/ examinare cu ajutorul calculatorului. Teste grilă cu răspunsuri unice/ multiple, având ponderi egale/ diferite. Teste de tip chestionar. Realizarea de proiecte sau prezentări pe calculator		2 ore

Bibliografie curs

1. Adăscăliţei A., Instruire Asistată de Calculator, Didactica informatică, Ed. Polirom, Iaşi, 2007;
2. Sandu, I.G., Instruire asistată de calculator- indrumar de laborator, Ed. Performantica , Iași, 2007;
3. Adăscăliţei A., Braşoveanu R-A., On-line engineering education in Technical University "Gh. Asachi" Iaşi, România, The 4th International Conference on Electromechanical and Power Systems, SIELMEN 2003;
4. Adăscăliţei A., Braşoveanu R-A., E-learning courses in Technical University "Gh. Asachi" Iaşi, România, The 4th International Conference on Electromechanical and Power Systems, SIELMEN 2003;
5. Adrian A., Adăscăliţei, Carcea M., Elemente Metodologice de Concepere, Proiectare şi Realizare a Programelor de Instruire Asistată de Calculator, e-Learning, Educaţie și Internet, CREDIS, Univ. Bucureşti, 3-5 Iulie 2003, http://elearning.credis.ro/home.htm.9. MEC – Consiliul Naţional pentru Curriculum. Curriculum Naţional. Planuri cadru pentru învăţământ preuniversitar, Bucureşti, 1999.
6. Ahmady, Ezatullah & Mojadadi, Abdul & Hakimi, Musawer. (2024). A Comprehensive Review of Cybersecurity Measures in the IoT Era. Journal of Social Science Utilizing Technology. 2. 288-298. 10.70177/jssut.v2i1.722.
7. Hietala Juhapekka, 2025. Research report: Cyber citizen skills and their development in the European Union 2025, https://cyber-citizen.eu/en/aineisto/report/

9.2 Activitatea de seminar	Metode de lucru[16]	Observaţii, timp alocat
I. Prezentarea laboratorului IAC si instructaj asupra tehnicii securităţii muncii în laborator.	Exerciţiul, Exerciţiul, lucrul pe grupe proiectul	2 ore
II. Procesarea textelor.– prezentare tehnică de lucru. Microsoft Power Point – prezentarea programului şi modul de lucru		2 ore
III. Microsoft EXCEL – utilizarea programului în aplicaţii de calcul tabelar (înregistrarea şi prelucrarea datelor sub formă tabelară)		2 ore
IV. Realizarea unui tutorial/simulari din domeniul de specializare		1 oră
V. Microsoft Front Page – prezentarea programului şi realizarea unei pagini web cu caracter educaţional		1 oră
VI. Integrarea ingineriei psihologiei sociale in curriculum		4 ore
VII. Evaluarea finală a activităţii de seminar		2 ore

Bibliografie seminar
1. Adăscăliţei A., Instruire Asistată de Calculator, Didactica informatică, Ed. Polirom, Iaşi, 2007.
2. Sandu I.G., Instruire asistată de calculator- îndrumar de laborator, Ed. Performantica , Iași, 2007;
3.CLRN team, 2025. What are the characteristics of a digital citizen? https://www.clrn.org/what-are-the-characteristics-of-a-digital-citizen/
4.Europol. (2023). Internet Organised Crime Threat Assessment (IOCTA) 2023. https://www.europol.europa.eu.
5.Europol. (2023). Online fraud schemes: A web of deceit. Europol Spotlight Report series. Publications Office of the European Union. https://doi.org/10.2813/543686.
6.Ferenț, Darius-Antoniu; Preja, Corneliu (2023), NATO's involvement in cyber defence, Intelligence Info, 2:1, 189-193, DOI: 10.58679/II30227, https://www.intelligenceinfo.org/natos-involvement-in-cyber-defence/
7. Adrian A., Adăscăliţei, Carcea M., Elemente Metodologice de Concepere, Proiectare şi Realizare a Programelor de Instruire Asistată de Calculator, e-Learning, Educaţie si Internet, CREDIS, Univ. Bucureşti, 3-5 Iulie 2003, http://elearning.credis.ro/home.htm.

10. Evaluare

Tip activitate	10.1 Criterii de evaluare	10.2 Metode de evaluare	10.3 Pondere din nota finală
10.4 Verificare	Completitudinea şi corectitudinea cunoştinţelor; Coerența logică, fluenţa, forţa de argumentare. Capacitatea de analiză, de interpretare personală, originalitatea, creativitatea. Gradul de asimilare a limbajului de specialitate şi capacitatea de comunicare. Capacitatea de a valorifica abilităţile dobândite. Capacitatea de a prelucra datele și problemele enunțate.	- test de evaluare sumativ (verificare finală).	50%
10.5 Aplicații	Capacitatea de aplicare în practică a cunoştinţelor învăţate. Capacitatea de analiză, de interpretare personală, originalitatea, creativitatea.	- participare activă la activități; - portofoliu.	50%
10.6 Condiții de promovare			
Nota finală minim 5			

Data completării: Septembrie 2025

Titular curs: Conf. univ. dr. Tudor STANCIU

Titular aplicații: Conf. univ. dr. Tudor STANCIU

Data avizării în departament:
Septembrie 2025

Director departament,
Conf. univ. dr. Gabriel ASANDULUI

Data avizării în Consiliul Facultății:
Septembrie 2025

Decan,
Profesor Andrei BURLACU, PhD

[1] *Licenţă/ Masterat.*
[2] *1-4 pentru licenţă, 1-2 pentru masterat.*
[3] *1-8 pentru licenţă, 1-4 pentru masterat.*
[4] *Examen (E), verificare (V) – din planul de învăţământ.*
[5] *DOB – disciplină obligatorie, DOP– disciplină opţională, DFA– disciplină facultativă;*
[6] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.5, 3.6abc).*
[7] *Liniile de mai jos se referă la studiul individual; totalul se completează la punctul 3.7.*
[8] *Între 2 şi 6 ore. Acestea reprezintă ore didactice şi nu se includ în studiul individual.*
[9] *Suma valorilor de pe liniile anterioare, care se referă la studiul individual.*
[10] *Suma dintre numărul de ore de activitate didactică directă (3.4) şi numărul de ore de studiu individual (3.7); trebuie să fie egală cu numărul de credite alocat disciplinei (punctul 3.9) x 25 de ore pe credit.*
[11] *Se menţionează disciplinele obligatoriu a fi promovate anterior sau echivalente.*
[12] *Tablă, vidoproiector, flipchart, materiale didactice specifice etc.*
[13] *Tehnică de calcul, pachete software, standuri experimentale, etc.*
[14] *Rezultatele învăţării prezentate sub formă de cunoştinţe, aptitudini, responsabilitate şi autonomie specifice disciplinei. Acestea vor fi corelate cu rezultatele învăţării pe domenii fundamentale şi domenii de licenţă (Anexa 2 din Standarde specifice ARACIS, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). Pentru programele de masterat, rezultatele învăţări sunt aferente nivelului 7 din CNC.*
[15] *Titluri de capitole şi paragrafe.*
[16] *Discuţii, dezbateri, prezentare şi/sau analiză de lucrări, rezolvare de exerciţii şi probleme.*

FIŞA DISCIPLINEI

Anul universitar 2025 - 2026

1. Date despre program

1.1 Instituția de învăţământ superior	Universitatea Tehnică „Gheorghe Asachi” din Iaşi
1.2 Facultatea	
1.3 Departamentul	Departamentul pentru Pregătirea Personalului Didactic
1.4 Domeniul de studii	Științe ale educației
1.5 Ciclul de studii[1]	Licență
1.6. Programul de studii	Program de formare psihopedagogică

2. Date despre disciplină

2.1.1 Denumirea disciplinei				**Managementul clasei de elevi Classroom Management**			
2.1.2. Codul disciplinei				CE322			
2.2 Titularul/ titularii activităţilor de curs				Lector univ. dr. Oana JITARU			
2.3 Titularul/ titularii activităţilor de aplicaţii (S, L, P, Pr)				Lector univ. dr. Oana JITARU			
2.4 Anul de studii[2]	3	2.5 Semestrul[3]	6	2.6 Tipul de evaluare[4]	C	2.7 Tipul disciplinei[5]	DL

3. Timpul total estimat al activităţilor zilnice (ore pe semestru)

3.1 Număr de ore pe săptămână	2	3.2 curs	1	3.3a sem.	1	3.3b laborator	-	3.3c proiect	3.3.d practică	
3.4 Total ore din planul de învăţământ[6]	28	3.5 curs	14	3.6a sem.	14	3.6b laborator	-	3.6c proiect	3.6.d	

Distribuția fondului de timp[7]	Nr. ore
Studiul după manual, suport de curs, bibliografie şi notițe	19
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate şi pe teren	13
Pregătire seminarii/laboratoare/proiecte, teme, referate şi portofolii	15
Examinări[8]	4
Alte activităţi:	

3.7 Total ore studiu individual[9]	47
3.8 Total ore pe semestru[10]	75
3.9 Numărul de credite	3

4. Precondiții (acolo unde este cazul)

4.1 de curriculum[11]	Parcurgerea disciplinei Psihologia educației, Pedagogie I, Pedagogie II
4.2 de rezultate ale învățării	Competențe psihopedagogice de comunicare, relaționare, evaluare

5. Condiţii

5.1 de desfăşurare a cursului[12]	Tablă, videoproiector, planșe
5.2 de desfăşurare a seminarului[13]	Tablă, videoproiector, planșe, materiale de lucru cu informații, fișe de lucru

6. Obiectivul general al disciplinei

Obiectivul general al disciplinei Managementul clasei de elevi este de a oferi un complex de informații de specialitate și modele de bune practici utilizate în lucrul cu elevii, în rol de viitor manager al clasei de elevi, care să constituie un sistem integrat de cunoștințe și abilități necesar formării profesionale și personale a studenților ce urmează modulul psihopedagogic.

7. Rezultatele învățării[14]

Cunoștințe	Studentul/ Absolventul: - Argumentează relațiile dintre predare-învățare-evaluare și formulează unele soluții creative pentru optimizarea componentelor educaționale; - Corelează cunoștințele de specialitate, psihopedagogice, în realizarea activităţilor instructiv-educative din învăţământ și a altor activități educaționale; - Argumentează potențialul formativ al teoriilor, principiilor și practicilor didactice specifice domeniului; - Identifică modul specific în care copiii/ elevii/ tinerii învață, teoriile și paradigmele de consiliere și suport cu privire la învățare și implicațiile asupra predării și evaluării; - Analizează și corelează cunoștințele psihopedagogice în activitățile de formare și de îmbunătățire continuă a practicilor profesionale; - Identifică specificul exigențelor și rigorilor de utilizare responsabilă a noilor tehnologii în situații didactice variate
Aptitudini	Studentul/ Absolventul: - Identifică nivelul achizițiilor anterioare ale copiilor/ elevilor/ tinerilor, individuale și de grup, și valorifică datelor obținute în proiectarea procesului educațional; - Identifică obiective de învățare în acord cu documentele curriculare, care să susțină dezvoltarea potențialului fiecărui copil/ elev/ tânăr; - Construiește contexte de învățare autentică, în manieră integrată, în care elevii își valorifică experiențele de viață și interesele de cunoaștere; - Selectează tehnici fundamentate științific pentru construcția coeziunii de grup, dezvoltarea socio-emoțională și pentru managementul comportamentului; - Participă periodic la activități de dezvoltare profesională continuă, în raport cu nevoile profesionale proprii și cu prioritățile locale sau naționale
Responsabilitate și autonomie	Studentul/ Absolventul: - Abordează critic responsabilitățile profesiei didactice cu evidențierea complexității procesului de învățământ; - Dezvoltă atitudini creatoare și constructive în aplicarea designului și principiilor pedagogice; - Indică necesitatea utilizării unor resurse variate pentru eficientizarea predării, susținerea învățării și sprijinirea elevilor în folosirea lor autonomă; - Comunică eficient prin oferirea de feedback constructiv și susține implicarea activă a elevilor în propriul proces de învățare; Apără/ Respectă diversitatea etnică, socio-economică, lingvistică și religioasă a elevilor și a comunităților de proveniență ale acestora și gestionează implicațiile acestora asupra dezvoltării și învățării; - Susține dezvoltarea socio-emoțională și morală a elevilor. - Susține familia/tutorii pentru a înțelege așteptările și rolul școlii, colaborând cu aceasta/ aceștia pentru reușita educațională a elevilor; - Combină abordări interogative și reflexive privind practica profesională și angajarea în pregătirea profesională și activitatea de formare continuă; - Acceptă rolurile manageriale specifice educației. Identifică diverse tipuri de decizii și resurse educaţionale necesare în diferite contexte specifice învăţământului; - Susține o cultură democratică, a învățării și a colaborării la nivelul grupei/clasei și al instituției; - Menține o atmosferă pozitivă în clasă și în școală, cultivând apartenența la comunitatea educațională; - Afișează/Manifestă echilibru profesional și capacitate de adaptare în diferite contexte, inclusiv în situații noi sau stresante, cu menținerea autorității adecvate în relație cu persoanele/grupurile educaționale

8. Metode de predare

În activitatea de predare vor fi utilizate metode didactice diverse, cum ar fi: prelegerea, explicația, descrierea, conversația, discuția colectivă, problematizarea

9. Conţinuturi

9. 1. Curs[15]	**Metode de predare**	**Timp alocat**
9.1.1. **Conceptul de management. Orientări și școli manageriale**. Conceptul de management; termen, semnificatii, management educational, managementul clasei de elevi. Orientari si scoli manageriale – definire și evoluție	Prelegere interactivă, Discuții, Explicații	2 ore
9.1.2. **Tipuri de culturi manageriale.** Cultura organizațională – definire și componente. Tipuri de culturi organizaționale. Cultura managerială în context educațional.		2 ore
9.1.3. **Activități manageriale ale profesorului.** Delimitări conceptuale. Teorii explicative și roluri manageriale ale cadrului didactic. Structura dimensionala a managementului clasei de elevi		2 ore
9.1.4. **Clasa de elevi ca grup primar.** Tipuri de grupuri psihosociale. Caracterizarea grupului mic psiho-social. Metode, tehnici si procedee de cunoastere a clasei de elevi.		2 ore
9.1.5. **Climatul psihosocial – fenomene ale dinamicii de grup.** Dinamica de grup – definire, factori facilitatori și frenatori ai dinamicii de grup. Climatul psihosocial – dimensiuni. Comunicare și conflict în clasa de elevi		2 ore

9.1.6. **Profesorul consilier, lecția de dirigenție** Definire. Competențe ale profesorului-consilier. Competențe digitale în exercitarea rolurilor manageriale ale profesorului. Platforme, metode, tehnici de lucru cu elevii	Prelegere interactivă, Discuții, Explicații	2 ore
9.1.7. **Recapitulare și tematica pentru examen** Reluarea principalelor teme abordate la curs. Discutarea tematicii pentru examen.	Harta conceptuală a cursului	2 ore

Bibliografie curs
- Apostolache, R., (2022). Competența pedagogică digitală, Editura Polirom, Iași
- Blondel, C. (2019). Introducere în psihologia colectivă. București: Editura For You
- Bocoș, M. D., (2013), Instruirea interactivă, Ed. Polirom, Iași
- Carnegie, D. (2020). Cum să devii un lider eficient. București: editura Curtea Veche
- Catalano, H. și Albulescu, I. (2021). e-Didactica. Procesul de instruire în mediul online, Editura DPH
- Ceobanu, C., (2016), Învățarea în mediul virtual, Ed. Polirom, Iași
- Cozolino, L. (2019). Predarea bazată pe atașament. Cum să creezi o clasă tribală. București: Editura Trei
- Enea, V. (2019). Intervenții psihologice în școală. Manualul consilierului școlar. Iași: Editura Polirom
- Gavreliuc, A. (2019). Psihologia socială și dinamica personalității. Iași: Editura Polirom
- Niculescu, M. (2016). Managementul clasei de elevi. Cluj-Napoca: Presa Universitară Clujeană
- Senge, P. (2016). Școli care învață. A cincea disciplină aplicată în educație. București: Editura Trei
- Tiron, E., (2011), Managementul clasei de elevi, Ed. Performantica, Iasi

9.2.a. Aplicații	Metode de lucru[16]	Observații, timp alocat
1. Diferențieri conceptuale: management, management educaţional, managementul clasei de elevi. Evoluţia şcolilor manageriale de la managementul clasic la managementul actual. Studii de caz	Lucru pe grupe; Exerciții; Analiza de caz; Discuția panel	2 ore
2. Tipuri de culturi manageriale: cultura puterii, cultura rolului, cultura sarcinii, cultura personală - Fişe de lucru		2 ore
3. Proiectarea, planificarea, organizarea, decizia, coordonarea, conducerea evaluarea, consilierea ca roluri şi activităţi manageriale ale profesorului. Fişe de lucru		2 ore
4. Relaţii şi interacţiuni în clasa de elevi: relaţii de inter-cunoaştere, relaţii de inter-comunicare, relaţii socio-afective preferenţiale, relaţii de influenţare. Fişe de lucru		2 ore
5. Clasa de elevi ca grup primar : caracteristici-dezbatere		2 ore
6. Cunoaşterea clasei de elevi: observaţia, chestionarul, testul, experimentul, metodele sociometrice, analiza produselor activităţii. Caietul dirigintelui		2 ore
7. Managementul schimbării, managementul comportamentului eficient, managementul proiectării, managementul organizării activităţii, managementul influenţării şi motivării, managementul comunicării, managementul relaţiilor, managementul evaluării. Fişe de lucru		2 ore

Bibliografie aplicații
- Albulescu, I., Catalano, H., (2021), e-Didactica, Ed. DPH, București
- Cozolino, L. (2019). Predarea bazată pe atașament. Cum să creezi o clasă tribală. București: Editura Trei.
- Enea, V. (2019). Intervenții psihologice în școală. Manualul consilierului școlar. Iași: Editura Polirom.
- Gavreliuc, A. (2019). Psihologia socială și dinamica personalității. Iași: Editura Polirom.
- Niculescu, M. (2016). Managementul clasei de elevi. Cluj-Napoca: Presa Universitară Clujeană.
- Senge, P. (2016). Școli care învață. A cincea disciplină aplicată în educație. București: Editura Trei.
- Tiron, E., (2011), Managementul clasei de elevi, Ed. Performantica, Iasi.

10. Evaluare

Tip activitate	10.1 Criterii de evaluare	10.2 Metode de evaluare	10.3 Pondere din nota finală
10.4 Examen	Completitudinea şi corectitudinea cunoştinţelor. Coerența logică, fluența, forța de argumentare. Capacitatea de analiză, de interpretare personală, originalitatea, creativitatea. Gradul de asimilare a limbajului de specialitate şi capacitatea de comunicare. Capacitatea de a valorifica abilităţile dobândite. Capacitatea de a prelucra datele și problemele enunțate.	- test de evaluare sumativ (verificare finală).	50%

10.5 Aplicații	Capacitatea de aplicare în practică a cunoştinţelor învăţate. Capacitatea de analiză, de interpretare personală, originalitatea, creativitatea.	- participare activă la activități; - portofoliu.	50%
10.6 Condiții de promovare			
Nota finală minim 5			

Data completării: Septembrie 2025

Titular curs: Lector univ. dr. Oana JITARU

Titular aplicații: Lector univ. dr. Oana JITARU

Data avizării în departament:
Septembrie 2025

Director departament,
Conf. univ. dr. Gabriel ASANDULUI

Data avizării în Consiliul Facultății:
Septembrie 2025

Decan,
Profesor Andrei BURLACU, PhD

---

[1] *Licenţă/ Masterat.*
[2] *1-4 pentru licenţă, 1-2 pentru masterat.*
[3] *1-8 pentru licenţă, 1-4 pentru masterat.*
[4] *Examen (E), verificare (V) – din planul de învăţământ.*
[5] *DOB – disciplină obligatorie, DOP– disciplină opţională, DFA– disciplină facultativă;*
[6] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.5, 3.6abc).*
[7] *Liniile de mai jos se referă la studiul individual; totalul se completează la punctul 3.7.*
[8] *Între 2 şi 6 ore. Acestea reprezintă ore didactice şi nu se includ în studiul individual.*
[9] *Suma valorilor de pe liniile anterioare, care se referă la studiul individual.*
[10] *Suma dintre numărul de ore de activitate didactică directă (3.4) şi numărul de ore de studiu individual (3.7); trebuie să fie egală cu numărul de credite alocat disciplinei (punctul 3.9) x 25 de ore pe credit.*
[11] *Se menţionează disciplinele obligatoriu a fi promovate anterior sau echivalente.*
[12] *Tablă, vidoproiector, flipchart, materiale didactice specifice etc.*
[13] *Tehnică de calcul, pachete software, standuri experimentale, etc.*
[14] *Rezultatele învăţării prezentate sub formă de cunoştinţe, aptitudini, responsabilitate şi autonomie specifice disciplinei. Acestea vor fi corelate cu rezultatele învăţării pe domenii fundamentale şi domenii de licenţă (Anexa 2 din Standarde specifice ARACIS, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). Pentru programele de masterat, rezultatele învăţări sunt aferente nivelului 7 din CNC.*
[15] *Titluri de capitole şi paragrafe.*
[16] *Discuţii, dezbateri, prezentare şi/sau analiză de lucrări, rezolvare de exerciţii şi probleme.*

FIŞA DISCIPLINEI

Anul universitar 2025 – 2026

1. Date despre program

1.1 Instituția de învăţământ superior	Universitatea Tehnică „Gheorghe Asachi” din Iaşi
1.2 Facultatea	
1.3 Departamentul	Departamentul pentru Pregătirea Personalului Didactic
1.4 Domeniul de studii	Științe ale educației
1.5 Ciclul de studii[1]	Licență
1.6. Programul de studii	Program de formare psihopedagogică

2. Date despre disciplină

2.1.1 Denumirea disciplinei				**Practică pedagogică de specialitate în învățământul preuniversitar Practicum in Educational Institutions**			
2.1.2. Codul disciplinei				CE323			
2.2 Titularul/ titularii activităţilor de curs				Lector univ. dr. Roxana BOBU			
2.3 Titularul activităţilor de aplicații (S, L, P, Pr)				Lector univ. dr. Roxana BOBU			
2.4 Anul de studii[2]	3	2.5 Semestrul[3]	5	2.6 Tipul de evaluare[4]	C	2.7 Tipul disciplinei[5]	DL

3. Timpul total estimat al activităţilor zilnice (ore pe semestru)

3.1 Număr de ore pe săptămână	3	3.2 curs		3.3a sem.		3.3b laborator	-	3.3c proiect	3.3.d practică	
3.4 Total ore din planul de învățământ[6]	42	3.5 curs		3.6a sem.		3.6b laborator	-	3.6c proiect	3.6.d	

Distribuția fondului de timp[7]	Nr. ore
Studiul după manual, suport de curs, bibliografie şi notițe	18
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate şi pe teren	7
Pregătire seminarii/laboratoare/proiecte, teme, referate şi portofolii	8
Examinări[8]	4
Alte activităţi:	

3.7 Total ore studiu individual[9]	33
3.8 Total ore pe semestru[10]	75
3.9 Numărul de credite	3

4. Precondiții (acolo unde este cazul)

4.1 de curriculum[11]	Promovarea disciplinei Didactica specializării
4.2 de rezultate ale învățării	Rezultate ale învățării specifice disciplinei Didactica specializării

5. Condiţii

5.1 de desfăşurare a cursului[12]	Asigurarea clasei de aplicație
5.2 de desfăşurare a practicii[13]	Să completeze caietul de practică respectând cerințele formulate de către mentor

6. Obiectivul general al disciplinei

Obiectivul general al disciplinei Practică de specialitate în învăţământul preuniversitar este de formare a de abilităţi practice în predarea-învăţarea-evaluarea disciplinelor tehnice.

7. Rezultatele învățării[14]

Cunoștințe	Studentul/ Absolventul: - Cunoaşterea organizării şi funcționării unei unităţi de învăţământ preuniversitar; - Identificarea documentelor curriculare specifice învăţământului obligatoriu; Conceperea şi proiectarea documentelor curriculare specifice învăţământului obligatoriu; - Formarea de abilităţi practice în predarea-învăţarea-evaluarea cunoştinţelor tehnice şi tehnologice; - Cunoaşterea, înţelegerea si utilizarea limbajului de specialitate
Aptitudini	Studentul/ Absolventul: - Aplicarea practica a conceptelor învăţate

Responsabilitate și autonomie	Studentul/ Absolventul: - Executarea responsabilă a sarcinilor profesionale, în condiţii de autonomie restrânsă şi asistență calificată; - Familiarizarea cu rolurile şi activităţile specifice muncii în grup si echipă

8. Metode de predare

În activitatea de predare vor fi utilizate metode didactice diverse, cum ar fi: prelegerea, explicația, descrierea, conversația, discuția colectivă, problematizarea

9. Conţinuturi

9.2.c. Practică	Metode de lucru[16]	Observaţii, timp alocat
1. Structura organizațională a unității școlare. 1.1. Activităţi de cunoaștere generală a școlii. 1.1.1. Conducerea activității școlare. 1.1.2. Organizarea colectivelor de profesori din școli. 1.1.3. Organizarea bazei materiale. 1.1.4. Organizarea serviciilor școlare. 1.1.5. Imaginea școlii pe plan local, naţional şi internaţional. 1.2. Colaborarea școlii cu familia. 1.3. Fișa postului	Prelegere interactivă, Discuții, Explicații	6 ore
2. Analiza documentelor curriculare specifice învăţământului obligatoriu. 2.1. Documentele curriculare. 2.1.1. Planul cadru de învăţământ. 2.1.2. Orarul şcolar. 2.1.3. Programa şcolară specifică domeniilor tehnice specifice. 2.1.4. Îndrumare de metodica predării, ghiduri metodologice de aplicare a planurilor cadru de învăţământ specifice domeniului. 2.1.5. Manualele şcolare. 2.1.6. Planificarea anuală. 2.1.7. Proiecte de unităţi de învăţare. 2.1.8. Proiecte de lecţii. 2.2. Documentele manageriale. 2.2.1. Documentele de management educational. 2.2.2. Regulamentul de organizare şi funcţionare al şcolii de aplicaţie. 2.2.3. Regulamentul de ordine interioară; regulamentul şcolar		10 ore
3. Proiectarea documentelor curriculare specifice învăţământului obligatoriu 3.1. Lectura personalizată a programelor şcolare. 3.2. Studiul manualelor existente, confruntarea cu programa şcolară şi baza materială aferentă din şcoală. 3.3. Planificarea activităţii didactice. 3.3.1. Planificarea anuală. 3.3.2. Planificarea semestrială. 3.3.3. Proiectarea unităţilor de învăţare. 3.3.4. Planificarea şi proiectarea activităţilor de evaluare		12 ore
4. Activităţi didactice demonstrative şi observative. 4.1. Participarea la lecţiile demonstrative de specialitate susţinute de mentor. 4.2. Însemnări şi dezbateri la lecţiile demonstrative susţinute de mentor		14 ore
Bibliografie practică: - Brîncoveanu, C. și Zamfirescu, G.O. (2018). Practica pedagogică. Caiet de seminar. București: Editura Pro Universitaria - Beadle, P. (2020). Cum să predai. Strategii didactice. București: didactica Publishing House - Ceobanu, C. (2016). Învățarea în mediul virtual. Ghid de utilizare a calculatorului în educație. Iași: Editura Polirom - MEC – Programe școlare. http://oldsite.edu.ro/index.php/articles/c565/ - Nițucă, C. și Carcea, M.I. (2020). Caiet de practică pedagogică - Senge, P. (2016). Școli care învață a cincea disciplină aplicată în educație. București: Editura Trei - Tomescu, M și Stănculescu, D. (2021). Caiet îndrumar pentru studenții care efectuează practica de specialitate în instituțiile publice sau organizații neguvernamentale (ed. a XI a). București: Editura ProUniversitaria		

10. Evaluare

Tip activitate	**10.1 Criterii de evaluare**	**10.2 Metode de evaluare**	**10.3 Pondere din nota finală**
10.4c Practica	**Testele pe parcurs:** Studenţii vor realiza o programă școlară, o planificare calendaristică, un proiectul unității de învăţare. Ponderea în nota finală: 50 % **Evaluarea finală:** Se va prezenta spre analiză supervizorului de practică pedagogică portofoliul de practică pedagogică. Ponderea în nota finală: 50 %	- Autoevaluarea, prezentarea și/sau susținerea lecțiilor - Evaluarea critică a unui proiect Obiectele de portofoliu necesare examenului de absolvire sunt: caietul de practică pedagogică, proiecte didactice, programe analitice, planificări calendaristice**.**	100% (minim 7)
10.6 Condiții de promovare			
Nota finală minim 7			

Data completării: Septembrie 2025

Titular curs:	Lector univ. dr. Roxana BOBU
Titular aplicații:	Lector univ. dr. Roxana BOBU
Data avizării în departament: Septembrie 2025	Director departament, Conf. univ. dr. Gabriel ASANDULUI
Data avizării în Consiliul Facultății: Septembrie 2025	Decan, Profesor Andrei BURLACU, PhD

[1] *Licenţă/ Masterat.*
[2] *1-4 pentru licenţă, 1-2 pentru masterat.*
[3] *1-8 pentru licenţă, 1-4 pentru masterat.*
[4] *Examen (E), verificare (V) – din planul de învăţământ.*
[5] *DOB – disciplină obligatorie, DOP– disciplină opţională, DFA– disciplină facultativă;*
[6] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.5, 3.6abc).*
[7] *Liniile de mai jos se referă la studiul individual; totalul se completează la punctul 3.7.*
[8] *Între 2 şi 6 ore. Acestea reprezintă ore didactice şi nu se includ în studiul individual.*
[9] *Suma valorilor de pe liniile anterioare, care se referă la studiul individual.*
[10] *Suma dintre numărul de ore de activitate didactică directă (3.4) şi numărul de ore de studiu individual (3.7); trebuie să fie egală cu numărul de credite alocat disciplinei (punctul 3.9) x 25 de ore pe credit.*
[11] *Se menţionează disciplinele obligatoriu a fi promovate anterior sau echivalente.*
[12] *Tablă, vidoproiector, flipchart, materiale didactice specifice etc.*
[13] *Tehnică de calcul, pachete software, standuri experimentale, etc.*
[14] *Rezultatele învăţării prezentate sub formă de cunoştinţe, aptitudini, responsabilitate şi autonomie specifice disciplinei. Acestea vor fi corelate cu rezultatele învăţării pe domenii fundamentale şi domenii de licenţă (Anexa 2 din Standarde specifice ARACIS, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). Pentru programele de masterat, rezultatele învăţări sunt aferente nivelului 7 din CNC.*
[15] *Titluri de capitole şi paragrafe.*
[16] *Discuţii, dezbateri, prezentare şi/sau analiză de lucrări, rezolvare de exerciţii şi probleme.*

FIŞA DISCIPLINEI

Anul universitar 2025 – 2026

1. Date despre program

1.1 Instituția de învăţământ superior	Universitatea Tehnică „Gheorghe Asachi” din Iaşi
1.2 Facultatea	
1.3 Departamentul	Departamentul pentru Pregătirea Personalului Didactic
1.4 Domeniul de studii	Științe ale educației
1.5 Ciclul de studii[1]	Licență
1.6. Programul de studii	Program de formare psihopedagogică

2. Date despre disciplină

2.1.1 Denumirea disciplinei				**Practică pedagogică de specialitate în învățământul preuniversitar Practicum in Educational Institutions**			
2.1.2. Codul disciplinei				CE323			
2.2 Titularul/ titularii activităţilor de curs				Lector univ. dr. Roxana BOBU			
2.3 Titularul activităţilor de aplicații (S, L, P, Pr)				Lector univ. dr. Roxana BOBU			
2.4 Anul de studii[2]	3	2.5 Semestrul[3]	6	2.6 Tipul de evaluare[4]	C	2.7 Tipul disciplinei[5]	DL

3. Timpul total estimat al activităţilor zilnice (ore pe semestru)

3.1 Număr de ore pe săptămână	2.57	3.2 curs		3.3a sem.		3.3b laborator	-	3.3c proiect	3.3.d practică		
3.4 Total ore din planul de învăţământ[6]	36	3.5 curs		3.6a sem.		3.6b laborator	-	3.6c proiect	3.6.d		

Distribuția fondului de timp[7]	Nr. ore
Studiul după manual, suport de curs, bibliografie şi notițe	8
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate şi pe teren	2
Pregătire seminarii/laboratoare/proiecte, teme, referate şi portofolii	4
Examinări[8]	4
Alte activităţi:	

3.7 Total ore studiu individual[9]	14
3.8 Total ore pe semestru[10]	50
3.9 Numărul de credite	2

4. Precondiții (acolo unde este cazul)

4.1 de curriculum[11]	Promovarea disciplinei Didactica specializării
4.2 de rezultate ale învățării	Rezultate ale învățării specifice disciplinei Didactica specializării

5. Condiţii

5.1 de desfăşurare a cursului[12]	Asigurarea clasei de aplicație
5.2 de desfăşurare a practicii[13]	Să completeze caietul de practică respectând cerințele formulate de către mentor

6. Obiectivul general al disciplinei

Obiectivul general al disciplinei Practică de specialitate în învățământul preuniversitar este de formare a de abilităţi practice în predarea-învăţarea-evaluarea disciplinelor tehnice.

7. Rezultatele învățării[14]

Cunoştințe	Studentul/ Absolventul: - Cunoaşterea, înţelegerea si utilizarea limbajului de specialitate; - Cunoaşterea metodelor de predare-evaluare; - Cunoaşterea modalităților de proiectare a lecțiilor; - Identificarea principalelor categorii de activităţi educative susţinute de mentori; - Dezvoltarea priceperilor, capacităților şi atitudinilor specifice profesorului diriginte

Aptitudini	Studentul/ Absolventul: - Aplicarea practica a conceptelor învăţate; - Observarea şi evaluarea comportamentului şcolare şi sociale ale elevilor - Realizarea lecțiilor de probă; - Realizarea lecțiilor finale; - Proiectarea, organizarea, îndrumarea şi evaluarea a unor activităţi educative extracurriculare
Responsabilitate și autonomie	Studentul/ Absolventul: - Executarea responsabilă a sarcinilor profesionale, în condiţii de autonomie restrânsă şi asistență calificată; - Familiarizarea cu rolurile şi activităţile specifice muncii în grup si echipă

8. Metode de predare

În activitatea de predare vor fi utilizate metode didactice diverse, cum ar fi: prelegerea, explicația, descrierea, conversația, discuția colectivă, problematizarea

9. Conţinuturi

9.2.c. Practică	Metode de lucru[16]	Observaţii, timp alocat
I. Activităţi educative demonstrative şi observative 1.1. Participarea la lecţiile educative demonstrative susţinute de mentor 1.2. Însemnări şi dezbateri la lecţiile educative demonstrative susţinute de mentor	Prelegere interactivă, Discuții, Explicații	4 ore
II.Cunoaşterea şi caracterizarea psiho-pedagogică a elevilor 2.1. Metode de cunoaştere a personalităţii elevilor 2.1.1. Metode şi tehnici de cunoaştere prin analiza comportamentului şi activităţii elevului (Metoda observaţiei, Analiza psiho-pedagogică a activităţii şi realizărilor elevului, Analiza psiho-pedagogică a procesului de integrare socială a elevului) 2.1.2. Metode şi tehnici de cunoaştere prin colaborare cu elevul (Autobiografia, Autocaracterizarea, Convorbirea, Chestionarul) 2.2. Metode şi tehnici de cunoaştere a personalităţii elevului prin intermediul personalităţii grupului/clasei din care face parte 2. 2. 1. Modalităţi de anchetă (ancheta pe bază de chestionar, Ancheta pe bază de interviu). 2.3. Completarea fişei de caracterizare psiho-pedagogică a elevului		10 ore
III. Proiectarea şi desfăşurarea activităţii de dirigenţie 3.1. Analiza de nevoi educaţionale la nivelul clasei de elevi 3.2. Planificarea şi proiectarea activităţilor educaţionale semestriale 3.3. Proiectarea şi realizarea unui proiect de dirigenţie 3.4. Susţinerea lecţiei de dirigenţie		8 ore
IV. Proiectarea şi desfăşurarea activităţilor educative nonformale 4.1. Proiectarea activităţilor educative nonformale 4.2. Organizarea şi desfăşurarea activităţilor educative nonformale 4.3. Evaluarea activităţilor educative nonformale		10 ore
V. Definitivarea portofoliului de practică pedagogică 5.1. Realizarea unei lucrări de tip studiu de caz, sinteză ştiinţifică, referat sau eseu 5.2. Analiza şi evaluarea activităţii practice de autoformare a studentului. Prezentarea lucrării teoretice în cadrul mini-simpozionului organizat pentru colocviul de practică pedagogică		4 ore

Bibliografie practică:

- Brîncoveanu, C. și Zamfirescu, G.O. (2018). Practica pedagogică. Caiet de seminar. București: Editura Pro Universitaria
- Beadle, P. (2020). Cum să predai. Strategii didactice. București: didactica Publishing House
- Ceobanu, C. (2016). Învățarea în mediul virtual. Ghid de utilizare a calculatorului în educație. Iași: Editura Polirom
- MEC – Programe școlare. http://oldsite.edu.ro/index.php/articles/c565/
- Nițucă, C. și Carcea, M.I. (2020). Caiet de practică pedagogică
- Senge, P. (2016). Școli care învață a cincea disciplină aplicată în educație. București: Editura Trei
- Tomescu, M și Stănculescu, D. (2021). Caiet îndrumar pentru studenții care efectuează practica de specialitate în instituțiile publice sau organizații neguvernamentale (ed. a XI a). București: Editura ProUniversitaria

10. Evaluare

Tip activitate	**10.1 Criterii de evaluare**	**10.2 Metode de evaluare**	**10.3 Pondere din nota finală**

10.4c Practica	**Testele pe parcurs:** Studenţii vor realiza o programă școlară, o planificare calendaristică, un proiectul unității de învățare. Ponderea în nota finală: 50 % **Evaluarea finală:** Se va prezenta spre analiză supervizorului de practică pedagogică portofoliul de practică pedagogică. Ponderea în nota finală: 50 %	- Autoevaluarea, prezentarea și/ sau susținerea lecțiilor - Evaluarea critică a unui proiect Obiectele de portofoliu necesare examenului de absolvire sunt: caietul de practică pedagogică, proiecte didactice, programe analitice, planificări calendaristice	100% (minim 7)
10.6 Condiții de promovare			
Nota finală minim 7			

Data completării: Septembrie 2025

Titular curs: Lector univ. dr. Roxana BOBU

Titular aplicații: Lector univ. dr. Roxana BOBU

Data avizării în departament:
Septembrie 2025

Director departament,
Conf. univ. dr. Gabriel ASANDULUI

Data avizării în Consiliul Facultății:
Septembrie 2025

Decan,
Profesor Andrei BURLACU, PhD

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[1] *Licenţă/ Masterat.*
[2] *1-4 pentru licenţă, 1-2 pentru masterat.*
[3] *1-8 pentru licenţă, 1-4 pentru masterat.*
[4] *Examen (E), verificare (V) – din planul de învăţământ.*
[5] *DOB – disciplină obligatorie, DOP– disciplină opțională, DFA– disciplină facultativă;*
[6] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.5, 3.6abc).*
[7] *Liniile de mai jos se referă la studiul individual; totalul se completează la punctul 3.7.*
[8] *Între 2 şi 6 ore. Acestea reprezintă ore didactice şi nu se includ în studiul individual.*
[9] *Suma valorilor de pe liniile anterioare, care se referă la studiul individual.*
[10] *Suma dintre numărul de ore de activitate didactică directă (3.4) şi numărul de ore de studiu individual (3.7); trebuie să fie egală cu numărul de credite alocat disciplinei (punctul 3.9) x 25 de ore pe credit.*
[11] *Se menţionează disciplinele obligatoriu a fi promovate anterior sau echivalente.*
[12] *Tablă, vidoproiector, flipchart, materiale didactice specifice etc.*
[13] *Tehnică de calcul, pachete software, standuri experimentale, etc.*
[14] *Rezultatele învățării prezentate sub formă de cunoştinţe, aptitudini, responsabilitate şi autonomie specifice disciplinei. Acestea vor fi corelate cu rezultatele învățării pe domenii fundamentale şi domenii de licență (Anexa 2 din Standarde specifice ARACIS, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). Pentru programele de masterat, rezultatele învățări sunt aferente nivelului 7 din CNC.*
[15] *Titluri de capitole şi paragrafe.*
[16] *Discuţii, dezbateri, prezentare şi/sau analiză de lucrări, rezolvare de exerciţii şi probleme.*

COURSE SYLLABUS

Academic year 2025-2026

1. Programme information

1.1 Higher Education Institution	"Gheorghe Asachi" Technical University of Iași
1.2 Faculty	Faculty of Civil Engineering and Building Services
1.3 Department	Civil and Industrial Engineering
1.4 Field of study	Civil Engineering
1.5 Level of study[1]	Bachelor's degree
1.6. Study programme	Inginerie civilă (în limba engleză)/ Civil Engineering - ICE

2. Course information

2.1.1 Course title				**Educație antreprenorială Entrepreneurial Education**			
2.1.2. Course code				CE325			
2.2 Lecture instructor				Associate Professor Lecturer Lidia ALEXA, PhD			
2.3 Laboratory instructor				Associate Professor Lecturer Lidia ALEXA, PhD			
2.4 Year of study[2]	3	2.5 Semester[3]	6	2.6 Assessment method[4]	C	2.7 Course type[5]	DS-E

3. Estimated total time (hours per semester)

3.1 Number of hours per week	3	3.2 lecture	2	3.3a seminar		3.3b laboratory	1	3.3c project		3.3.d practical sessions	
3.4 Total number of hours in the curriculum[6]	42	3.5 lecture	28	3.6a seminar		3.6b laboratory	14	3.6c project		3.6.d	

Workload distribution [7]	No. of hours
Study based on textbook, course material, reading list and notes	20
Additional research in the library, on specialised electronic platforms, and in the field	35
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios	20
Assessment[8]	6
Other activities:	8

3.7 Total number of individual study hours[9]	83
3.8 Total number of hours per semester[10]	125
3.9 Number of ECTS credits	5

4. Prerequisites (if applicable)

4.1 Curriculum prerequisites[11]	
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture[12]	Video projector
5.2 for the laboratory[13]	Video projector

6. General objective of the course

To provide students with knowledge and practical skills related to a wide range of techniques and tools essential for entrepreneurs, enabling them to identify opportunities, develop business ideas, and effectively manage entrepreneurial processes.

7. Learning outcomes [14]

Knowledge	The student/ graduate: - Describe clearly and coherently the concepts, methods, and working tools required to identify the factors influencing organizational performance, analyze the marketing environment, study the market, understand consumer behavior, and analyze data relevant to marketing activities; - Possess solid knowledge in the field of entrepreneurship
Skills	The student/ graduate: - Select appropriate methods for managing relationships with clients and suppliers; - Lead, manage, and work effectively in teams, demonstrating a deep understanding of organizational dynamics
Responsibility and autonomy	The student/ graduate: - Develop an adaptable, resilient, and entrepreneurial mindset, motivating and influencing the team to create a positive and productive work environment

8. Teaching strategies

In teaching the *Entrepreneurial Education* course, participatory lectures and interactive debates will be used, based on PowerPoint presentations made available to students. The presentations include images, charts, videos, and case studies, ensuring that theoretical concepts are easy to understand and apply. Each session will begin with a brief review of the topics discussed in the previous lecture, in order to reinforce knowledge and support continuity in learning.

The course combines direct exploration of entrepreneurial phenomena (market analysis, opportunity identification, business simulations) with practical and applied activities (case studies, exercises, problem-solving), enabling students to develop real competencies in starting and managing a business.

9. Content

9. 1. Lecture[15]	**Teaching strategies**	**Time allocation**
9.1.1. Entrepreneurship & Management. Differences and complementarities between entrepreneurship and management. The role of management in business development. Entrepreneurial leadership styles	Interactive lecture, debates, explanations	2 hours
9.1.2. Characteristics of an Entrepreneur. Personal Brand Building		2 hours
9.1.3. The Business Idea. **Sources of business ideas. Business idea generation. Criteria for selecting a viable idea**		2 hours
9.1.4. Identifying and Recognizing Business Opportunities. Methods for opportunity identification. Success and failure factors. Market evaluation and consumer needs assessment		2 hours
9.1.5. Validation of Business Opportunities. Testing the business idea. Interaction with potential customers. Prototyping and MVP (Minimum Viable Product). Feedback and iteration		2 hours
9.1.6. Business Models. What is a business model? Components of a business model. Examples of business models (B2B, B2C, freemium, subscription, etc.). Building a sustainable business model		2 hours
9.1.7. Go-to-Market Strategy. Defining the target audience and market segmentation. Positioning the product or service in the market. Pricing and monetization model selection. Choosing distribution and sales channels. Designing an initial marketing campaign		2 hours
Reading list for the lecture: 1. Lidia Alexa – Antreprenoriat – Note de curs. Suport în format digital, 2022 2. Steve Mariotti, Caroline Glackin, Antreprenoriat. Lansarea și administrarea unei afaceri. JA Romania, 2021. 3. Alexander Osterwalder, Yves Pigneur - Business Model Generation, Editura Publica, 2017		
9.2b Laboratory	Work methods [17]	Observations, allotted time
9.2.1. Where to Start? Self-Assessment of Entrepreneurial Skills. Values and principles. Personal brand building.	Individual and team-based work, explanation of the working process, and discussions of	1 hour
9.2.2. The Business Idea. Defining the business idea and building the team.		1 hour
9.2.3. Business Idea Development. Creating the value proposition and defining the Minimum Viable Product (MVP)		1 hour
9.2.4. Customer Discovery. Conducting customer interviews		1 hour
9.2.5. The Customer and the Market. Market segmentation and customer persona (avatar) development		1 hour

9.2.6. Go-to-Market Strategy	the results achieved	1 hour
9.2.7. Business Pitching		1 hour
1. Lidia Alexa – Antreprenoriat – Note de curs. Suport în format digital, 2022 2. Steve Mariotti, Caroline Glackin, Antreprenoriat. Lansarea și administrarea unei afaceri. JA Romania, 2021 3. Alexander Osterwalder, Yves Pigneur - Business Model Generation, Editura Publica, 2017		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam	Completeness and accuracy of knowledge; Logical coherence, fluency, and strength of argumentation Capacity for analysis, personal interpretation, originality, and creativity; Level of command of specialised terminology and communication skills; Ability to apply acquired skills; Ability to process data and solve the problems presented	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	100%	50%
10.5b Laboratory	Ability to work in a team Ability to apply acquired knowledge in practice in different contexts Capacity for analysis, personal interpretation, originality, and creativity	- completion of laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		50%
10.6 Passing requirements Demonstrate an understanding of the fundamental concepts of entrepreneurship.				
The final grade for a course is determined by taking into account the scores and weightings assigned to each course activity. Whole-number grades from 10 to 1 will be awarded, with a grade of 5 certifying the achievement of the minimum learning outcomes required for the course and the awarding of the corresponding ECTS credits.				

Date of completion: September 2025

Lecture instructor: Associate Professor Lecturer Lidia ALEXA, PhD

Laboratory instructor: Associate Professor Lecturer Lidia ALEXA, PhD

Date of departmental approval:
September 2025

Head of Department,
Professor Marius PÎSLARU, PhD

Date of faculty council approval:
September 2025

Dean,
Professor Andrei BURLACU, PhD

[1] *Bachelor's/ Master's degree.*
[2] *1-4 for bachelor's degree, 1-2 for master's degree.*
[3] *1-8 for bachelor's degree, 1-4 for master's degree.*
[4] *Exam (E), test (T) – from the curriculum.*
[5] *DOB – compulsory course, DOP– elective course, DFA– optional course;*
[6] *It is equal to 14 weeks x the number of hours indicated in section 3.1 (similarly for 3.5, 3.6abc).*
[7] *The lines below refer to individual study; the total is indicated in section 3.7.*
[8] *Between 2 and 6 hours. These represent teaching hours and are not included in individual study.*
[9] *Sum of the values from the previous lines, referring to individual study.*
[10] *Sum of direct contact hours (3.4) and individual study hours (3.7); this must equal the number of credits allocated to the course (section 3.9) × 25 hours per credit.*
[11] *Courses that must be completed beforehand or equivalent courses.*
[12] *Blackboard, projector, flipchart, specific teaching materials, etc.*
[13] *Computing equipment, software packages, experimental setups, etc.*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course. These should be correlated with the learning outcomes in fundamental and bachelor's degree fields (Annex 2 of ARACIS Specific Standards, www.aracis.ro/wp-content/uploads/2025/04/Standarde-specifice-programe-de-studii-universitare-de-licenta_aprilie-2025.pdf). For master's programmes, learning outcomes correspond to level 7 of the National Qualifications Framework (CNC).*
[15] *Chapter and paragraph titles.*
[16] *Discussions, debates, presentation and/or analysis of works, exercises and problem solving.*
[17] *Practical demonstration, exercise, experiment.*
[18] *Case study, demonstration, exercise, error analysis, etc.*