

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	Analiză matematică 1 Mathematical Analysis 1						
2.1.2. Course code	CE101						
2.2 Lecture instructor	Lecturer Sânziana CARAMAN, Dr						
2.3 Seminar instructor	Lecturer Sânziana CARAMAN, Dr						
2.4 Year of study ²	1	2.5 Semester ³	1	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	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										18	
Additional research in the library, on specialised electronic platforms, and in the field										18	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										22	
Assessment ⁸										6	
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	Mathematics, high school level, at least M2 To know and to be able to make computations in differential calculus

5. Requirements

5.1 for the lecture ¹²	The classroom will be endowed with video projector, blackboard, and specific materials. The students will respect the Students Rights and Obligations Code and the regulations set out in the Charter of the "Gheorghe Asachi" Technical University of Iasi
5.2 for the seminar ¹³	The classroom will be endowed with video projector, blackboard, and specific materials. Time limits for tests are set by the course organizer.

6. General objective of the course

The general objective is that students acquire a set of mathematical knowledge strictly necessary for the successful completion and understanding of other fundamental or specialized disciplines. In parallel, we aim to develop logical thinking and improve calculation skills, creating a clear image of the importance and role of the discipline in

the training of future specialists. The aim is to acquire knowledge of differential calculus (partial derivatives, extremum problems), numerical series and power series, and general elements of mathematical analysis necessary for the understanding of other fundamental or specialized disciplines and the application of this mathematical knowledge in solving practical problems.

7. Learning outcomes¹⁴

Knowledge	<p>The student/ graduate will:</p> <ul style="list-style-type: none"> - defines the fundamental concepts in the basic disciplines of mathematics; - compares and distinguishes related notions and their properties in the basic disciplines of mathematics; - formulates observations and differentiates notions, properties, and assertions in the basic disciplines of mathematics through examples and counterexamples; - defines the basic concepts in advanced disciplines of mathematics from the curricula; - compares and distinguishes related notions and their properties in advanced disciplines of mathematics from the curricula; formulates observations and differentiates notions, properties, and assertions in advanced disciplines of mathematics through examples and counterexamples; - defines the concepts in the basic disciplines of computer science and/or applied mathematics; - compares and distinguishes related notions and their properties in the basic disciplines of computer science and/or applied mathematics; - formulates observations and differentiates notions, properties, and assertions from the basic disciplines of computer science and/or applied mathematics through examples and counterexamples; - indicates and recognizes the concepts involved in the requirements of the exercises and problems formulated in the disciplines in the curricula.
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - provides examples of the use of basic theoretical concepts and results when solving exercises and problems formulated in relation to the topics covered in the curriculum disciplines; - recognizes and analyzes the necessary and/ or sufficient conditions in the statement of mathematical assertions and specifies their role in the demonstration; - identifies and describes the essential elements in the construction of demonstrations of mathematical assertions (lemmas, propositions, theorems), recognizes reasoning errors and corrects them; - answers questions and correctly and rigorously formulates the statements of mathematical assertions (lemmas, propositions, theorems) in the curriculum disciplines; - reproduces and analyzes the hypotheses and conclusions in mathematical assertions and discusses how they can be linked within the demonstration; - argues the role of elements in the hypothesis of mathematical assertions, discusses how these are articulated in the demonstration and independently constructs correct demonstrations of mathematical assertions within the major disciplines of mathematics; identifies and applies appropriate techniques for solving exercises and problems in the major disciplines of mathematics; - identifies and applies appropriate techniques for solving problems in advanced disciplines of mathematics; - describes real-world problems in mathematical terms, identifies working hypotheses, constructs appropriate mathematical models, and explains the limitations of the models thus obtained; - uses numerical methods and software packages to solve the constructed mathematical models and interprets the mathematical results thus obtained from the perspective of the practical problem modeled.
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - uses logical thinking, analyses the statement of the problems, selects the specific method of solving them and uses logical schemes and work diagrams in solving problems in the topics covered in the curriculum disciplines; adapts the techniques and strategies for solving routine problems to solving synthesis problems and with a higher degree of complexity and uses various representations to illustrate or justify some methods of solving problems; - makes customizations or generalizations, starting from a given property or problem and individually writes complete solutions to the problems solved in the topics covered; - extends the techniques for solving common problems to problems that arise in new situations and with a progressive degree of difficulty, searches for other methods of solving them and formulates consequences and conclusions that arise from a set of hypotheses;

Responsibility and autonomy	<ul style="list-style-type: none"> - analyses solution methods, establishes the uniqueness of solutions, recognizes reasoning errors in solving a problem, finds a way to eliminate them and obtain the correct version of the demonstration / solution method. - verifies, on particular cases or by constructing examples or counterexamples, the validity of mathematical statements; - translates a practical situation into mathematical language, solves the problem obtained and interprets the results obtained; identifies and correlates connections between apparently unrelated concepts from the major disciplines of mathematics; - summarizes, classifies, and presents the conclusions of given problems using various types of representations and clearly and efficiently communicates mathematical concepts and reasoning to specialists and non-specialists through written reports and oral presentations; - solves using analytical and/or numerical methods and uses dedicated software packages or writes codes developed in order to solve practical problems and mathematical models constructed using differential and partial derivative equations or other tools from the curricula covered; - uses independent information and documentation methods, which provide openness to continuous learning, develops scientific communications or scientific reports and makes complete bibliographic references by respecting ethical norms when citing the documentation sources used. The student/graduate approaches problem solving from different angles and directions, including based on non-traditional methodologies, in order to use them in computer science and other applications of mathematics.
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8. Teaching strategies

The teaching activity will use participatory lectures and debates based on presentations (beamer) that will be made available to students. The presentations contain the main concepts and results, 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 full courses and seminars will be made available on the Moodle platform as pdf files.

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).

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Sequences of real numbers: The real numbers set; Sequences of real numbers; Convergence and divergence; Cauchy sequences and standard limits; The linear space \mathbb{R}^n ; Convergence of sequences in \mathbb{R}^n .	Presentation with video projector. Presentation on the board, interactive lecture. Discussions, Explanations	6 hours
9.1.2. Series: Series of numbers; Tests of convergence for series with positive terms; Tests of convergence for series with arbitrary terms		6 hours
9.1.3. Limits and continuity of functions: Limits for real functions of one variable and of several variables and limits for vector functions; Continuity of real functions of one variable and of several variables and continuity for vector functions; theorems, examples		4 hours
9.1.4. Differentiability: The derivative for real functions of one variable and for vector functions of real variable; The derivatives of elementary functions and operations with derivatives; Partial derivatives; Higher order derivatives and higher order partial derivatives; Differentials of first order and of higher order; The formula of Taylor; Applications (monotony of functions, l'Hôpital Rules, points of extremum)		10 hours
9.1.5. Extrema for real functions of several variables: The stationary points; The points of local extremum		2 hours
Reading list for the course: <ol style="list-style-type: none"> 1. S. Caraman, Lecture notes on mathematical analysis, Editura Soc. Acad. „Matei-Teiu Botez”, Iași, 2008 2. P. Georgescu, Elemente de calcul diferențial pe dreapta reală, Editura MatrixRom, București, 2012 3. A. I. Lazcu, Elemente de analiză matematică (platforma Moodle) 4. R. Luca-Tudorache, Analiză matematică. Calcul diferențial, Tehnopress, Iași, 2005 5. L. Maticiu, Analiză matematică, Editura Performantica, Iași, 2014. 6. M. Nicolescu, N. Dinculeanu, S. Marcus, Analiză matematică, Vol.I,II, Editura Didactică și Pedagogică, București, 1971 7. S. L. Romaniuc, Elemente de analiză matematică, Editura Performantica, Iași, 2022 8. R. Strugariu, Analiză matematică. Calcul diferențial, Editura Performantica, Iași, 2013 		
9.2b Seminar	Work methods ¹⁷	Observations, allotted time
9.2.1. Sequences and series: Computation of limits of sequences using operations with limits, standard limits, monotony, and boundedness properties; Limits of sequences in \mathbb{R}^n ;	Discussions, explanations, solving	6 hours

Computation of the sum of a numerical series; The study of the convergence of numerical series using tests for series with positive terms and with arbitrary terms	exercises and problems	
9.2.2. Limits and continuity of functions: Standard limits for real functions of one variable; Computation of limits for functions of several variables and for vector functions; The study of continuity		2 hours
9.2.3. Differentiability: Computation of derivatives and partial derivatives; Computation of higher order derivatives and higher order partial derivatives; Computation of differentials of first order and of higher order; The formula of Taylor		2 hours
9.2.4. Applications of derivatives and partial derivatives: Monotony and limits for real functions of real variable; Gradient, divergence, curl, the Jacobian, the Hessian; Differentials		2 hours
9.2.5. Problems of extrema: The stationary points; The points of local extremum for a real function of several variables		2 hours
Reading list for the seminar: 1. S. Caraman, Lecture notes on mathematical analysis, Editura Soc. Acad. „Matei-Teiu Botez”, Iași, 2008. 2. P. Georgescu, Elemente de calcul diferențial pe dreapta reală, Editura MatrixRom, București, 2012. 3. A. I. Lazu, Elemente de analiză matematică (platforma Moodle) 4. R. Luca-Tudorache, Analiză matematică. Calcul diferențial, Tehnopress, Iași, 2005. 5. L. Maticiuc, Analiză matematică, Editura Performantica, Iași, 2014. 6. M. Nicolescu, N. Dinculeanu, S. Marcus, Analiză matematică, Vol.I,II, Editura Didactică și Pedagogică, București, 1971. 7. S. L. Romaniuc, Elemente de analiză matematică, Editura Performantica, Iași, 2022. 8. R. Strugariu, Analiză matematică. Calcul diferențial, Editura Performantica, Iași, 2013.		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method	10.3 Percentage of final grade
10.4 Exam	Completeness and correctness of knowledge. Logical coherence, fluency, argumentative force. Capacity for analysis, personal interpretation, originality, creativity. Degree of assimilation of specialized language and communication ability. Ability to capitalize on acquired skills. Ability to process data and stated problems.	- formative evaluation test (throughout the semester).	
		- summative evaluation test (final exam).	60%
10.5a Seminar	The ability to apply the knowledge learned in practice. The ability to analyse, personal interpretation, originality, creativity.	- active participation in the activities	40%
10.6 Passing requirements			
The final assessment result for MS1 results from considering the scores and weights assigned to each activity within the discipline. Whole marks from 10 to 1 will be awarded, with a mark of 5 certifying the acquisition of the minimum learning outcomes: determine the primitives of a (simple) function of one variable using the table of primitives, integration by parts, simple substitutions, integration of a rational function; calculate first and second-degree line integrals; solve differential equations with constant coefficients; determine the trigonometric form of a complex number and calculate real/complex integrals using the theory of residues.			

Date of completion: September 2025

Lecture instructor:

Lecturer Sânziana CARAMAN, Dr

Seminar instructor:

Associate Professor Marcel ROMAN, PhD

Date of departmental approval:
September 2025

Head of Department,
Associate Professor Marcel ROMAN, 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.

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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	Algebra și Geometrie 1 Algebra and Geometry 1						
2.1.2. Course code	CE102						
2.2 Lecture instructor	Associate Professor Marcel ROMAN, PhD						
2.3 Seminar instructor	Associate Professor Marcel ROMAN, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	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										14	
Additional research in the library, on specialised electronic platforms, and in the field										14	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										16	
Assessment ⁸										2	
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	

5. Requirements

5.1 for the lecture ¹²	Teaching activities in physical format, at the faculty headquarters: blackboard, video projector, specific teaching materials, etc. If necessary, teaching activities in synchronous online format (on educational platform Microsoft Teams 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 by the Charter of the "Gheorghe Asachi" Technical University of Iasi
5.2 for the seminar ¹³	Applied activities in physical format, at the faculty headquarters: computing equipment, software packages, experimental stands, etc. If necessary, applied activities in synchronous online format (on educational platform Microsoft Teams with academic subscriptions), with the necessary equipment for a

	video conference (computer/laptop, video camera, microphone, speakers/headphones, internet connection). The deadlines for submitting the papers are established by the lecturers and are sent to the students at the beginning of the semester.
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6. General objective of the course

The course covers the study of systems of linear equations and the properties of matrices, Linear Spaces, linear transformations, eigenvalues and eigenvectors, diagonalization, Q-forms and the background of vector algebra. The concepts of linear algebra are extremely useful in engineering.

7. Learning outcomes¹⁴

Knowledge	The student / graduate will: - know the fundamental theoretical notions of linear algebra: matrix, determinant, linear system, linear space (definitions and properties), linear transformations (definition, properties, characteristics), eigenvalues and eigenvectors (diagonalization process), Q-forms (definition, matrix of the Q-form, canonical form, classification), vectors (operations with vectors, characterization of parallelism, perpendicularity, coplanarity).
Skills	The student / graduate: - analyse the solution set of a system of linear equations; - express some algebraic concepts (such as binary operation, group, field); - do elementary matrix operations; express a system of linear equations in a matrix form; - apply ETM (elementary transformation method) for solving a system of linear equations; - generalize the concepts of a real (complex) vector space to an arbitrary finite-dimensional vector space; - define a vector space and subspace of a vector space; explain properties of \mathbb{R}^n and subspaces of \mathbb{R}^n ; - determine whether a subset of a vector space is linear dependent; - describe the concept of a basis for a vector space; - investigate properties of vector spaces and subspaces using by linear transformations; - express linear transformation between vector spaces; - represent linear transformations by matrices; - explain what happens to representing matrices when the ordered basis is changed; - describe the concepts of eigenvalue, eigenvector and characteristic polynomial; - determine whether a linear transformation is diagonalizable or not; - reduce a Q-form to the canonical form and classify the Q-form; - operate with vectors and characterize different geometrical positions
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; - 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 approach uses discovery-based learning models, facilitated by direct and indirect exploration of algebra (demonstrations, modelling), as well as action-based methods, such as exercises, problem-solving.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Matrices - Matrices and determinants. Symmetric and skew-symmetric matrix. GL (n:K) and GO (n:K).	Interactive lecture, debates, explanations	2 hours
9.1.2. Linear systems - Cramer type systems. Rouché-Frobenius and Kronecker-Capelli theorems. Homogeneous systems. The method of Gaussian elimination. Elementary transformations method (ETM).		2 hours
9.1.3. Vector spaces (linear spaces) - The notion of vector space. Properties. Linear subspace. Generators, Bases and dimension. Coordinates.		4 hours

9.1.4. Linear transformations - Linear endomorphisms. The kernel and the image of an endomorphism. The rank theorem. Changes of coordinates of a vector in two bases. The linear space $L(X, Y)$. The matrix of the endomorphism. The change of the matrix of an endomorphism with respect to a change of basis. Invariant subspaces of an endomorphism. Eigenvalues and eigenvectors. Diagonalization of (the matrix of) endomorphisms. Cayley-Hamilton Theorem.	Interactive lecture, debates, explanations	8 hours
9.1.5. Linear and bilinear forms. Quadratic forms (Q-forms) - Linear forms. The dual space. Changes of coefficients of a linear form with respect to a change of bases. Bilinear forms (BLF-s). The space $L(X, K)$. The analytic expression and the matrix of the BLF. The change of the matrix of a BLF with respect to a change of basis. Symmetric bilinear forms and Q-forms. Canonical Diagonal form of a Q-form. The Sylvester theorem. The Gauss method and the Jacobi method.		6 hours
9.1.6. Inner product space IPS, normed vector space and metric spaces - The notion of inner product. Inner product space (IPS) or Euclidean spaces. The normed vector space. Orthogonal system of vectors, orthonormal bases. Gram-Schmidt theorem. Orthogonal transformations. Orthogonal matrices. Symmetric linear transformations (self-adjoint endomorphisms). Eigenvalues and eigenvectors. Q-forms on IPS. The diagonalization of an endomorphism using eigenvalues (the eigenvalues method).		4 hours
9.1.7. Vector Algebra - The vector spaces V^2 and V^3 . Operations with vectors. Collinear and coplanar vectors. Orthogonal projections. The dot product, the cross product, the double cross product, and the mixed product.		2 hours
<p>Reading list for the course:</p> <ol style="list-style-type: none"> 1. D.W. Jordan & P. Smith, „Mathematical Techniques” (third edition), Oxford University Press, ISBN:0 19 924972 5, (2002); 2. A.L. Pletea, D. Roșu, G. Bercu, L. Dăuș, M. Vlădoiu, C. Voica, “Algebră liniară, geometrie analitică, geometrie diferențială și elemente de algebra tensorială”, (Linear Algebra, Analytic Geometry, Differential Geometry and Tensorial Algebra), vol 1, StudIS, (2013); 3. M. Roman, (cu C. Frigioiu, V. Balan, C. Udriște (coordonator)), “Algebră liniară, geometrie analitică, geometrie diferențială și elemente de algebra tensorială”, (Linear Algebra, Analytic Geometry, Differential Geometry and Tensorial Algebra), vol 2, StudIS, (2013); 4. A. Cărașu, “Linear Algebra”, MatrixRom, București, (1999); 5. A. Cărașu, “Vector Algebra, Analytic and Differential Geometry”, vol.I+II, PIM Publishing House, Iași, (2003); 6. Advanced Engineering Mathematics - NPTEL, http://www.ce.tuiasi.ro / http://nptel.ac.in/courses/index.php?subjectId=111105035 <p>Moodle:</p> <p>https://edu.tuiasi.ro/pluginfile.php/88322/mod_resource/content/1/ALGA_cap1.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88323/mod_resource/content/1/ALGA_cap2.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88324/mod_resource/content/1/ALGAcap3.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88325/mod_resource/content/1/ALGAcap4.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88326/mod_resource/content/1/ALGAcap5.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88327/mod_resource/content/1/ALGAcap6.pdf</p>		
9.2b Seminar	Work methods ¹⁷	Observations, allotted time
9.2.1. Matrices and determinants	Explanations, solving problems	2 hours
9.2.2. Linear systems		2 hours
9.2.3. Vector spaces (linear spaces)		4 hours
9.2.4. Linear transformations		6 hours
9.2.5. Linear and bilinear forms. Quadratic forms (Q-forms)		6 hours
9.2.6. Inner product space (IPS), normed vector space, and metric spaces		4 hours
9.2.7. Vector Algebra		4 hours
<p>Reading list for the seminar:</p> <ol style="list-style-type: none"> 1. D.W. Jordan & P. Smith, „Mathematical Techniques” (third edition), Oxford University Press, ISBN:0 19 924972 5, (2002); 2. A.L. Pletea, D. Roșu, G. Bercu, L. Dăuș, M. Vlădoiu, C. Voica, “Algebră liniară, geometrie analitică, geometrie diferențială și elemente de algebra tensorială”, (Linear Algebra, Analytic Geometry, Differential Geometry and Tensorial Algebra), vol 1, StudIS, (2013); 3. M. Roman, (cu C. Frigioiu, V. Balan, C. Udriște (coordonator)), “Algebră liniară, geometrie analitică, geometrie diferențială și elemente de algebra tensorială”, (Linear Algebra, Analytic Geometry, Differential Geometry and Tensorial Algebra), vol 2, StudIS, (2013); 4. A. Cărașu, “Linear Algebra”, MatrixRom, București, (1999); 5. A. Cărașu, “Vector Algebra, Analytic and Differential Geometry”, vol.I+II, PIM Publishing House, Iași, (2003); 6. Advanced Engineering Mathematics - NPTEL, http://www.ce.tuiasi.ro / http://nptel.ac.in/courses/index.php?subjectId=111105035 <p>Moodle:</p> <p>https://edu.tuiasi.ro/pluginfile.php/88328/mod_resource/content/1/sem1.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88330/mod_resource/content/1/sem23.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88331/mod_resource/content/1/sem45.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88332/mod_resource/content/1/sem89.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88343/mod_resource/content/1/sem10.pdf</p> <p>https://edu.tuiasi.ro/pluginfile.php/88344/mod_resource/content/1/sem10-11.pdf</p>		

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)	10%	70%
		- formative assessment test (tests during the semester), W6, W12	20%	
		- summative assessment test (final assessment)	70%	
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities - assessment test		30%
<p>10.6 Passing requirements</p> <ul style="list-style-type: none"> - The student will be able to perform calculations with matrices, determinants and will be able to solve systems of linear equations; - The student will be able to perform calculations with vectors and linear applications; - The student will know how to calculate the eigenvalues and eigenvectors of a matrix (of an endomorphism); - The student will be able to determine the nature, signature, and canonical form for a quadratic form; - • The student will be able to perform calculations with vectors. <p>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.</p>				

Date of completion: September 2025

Lecture instructor:

Associate Professor Marcel ROMAN, PhD

Seminar instructor:

Associate Professor Marcel ROMAN, PhD

Date of departmental approval:
September 2025

Head of Department,
Associate Professor Marcel ROMAN, 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) x 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	Mecanică 1 Mechanics 1						
2.1.2. Course code	CE103						
2.2 Lecture instructor	Associate Professor Corneliu Eugen ȘFARTZ, PhD						
2.3 Seminar instructor	Associate Professor Corneliu Eugen ȘFARTZ, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	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	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										20	
Additional research in the library, on specialised electronic platforms, and in the field										18	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										15	
Assessment ⁸										3	
Other activities:										5	
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	- skills in calculation and working with basic geometric and algebraic notions; - abilities to think logically and to solve problems.

5. Requirements

5.1 for the lecture ¹²	Room equipped with blackboard, video projector
5.2 for the seminar ¹³	Room equipped with blackboard, video projector

6. General objective of the course

Mechanics 1 is structured in accordance with the faculty’s curriculum, ensuring coherent integration with the other specialized subjects within the Study programme. The course emphasizes aligning its content with practical applications covered in related courses and specialized projects. It addresses concepts of vector calculus applied to

planar force systems, the static equilibrium of the rigid body, the static equilibrium of systems of rigid bodies, as well as notions of mass geometry, such as determining centers of mass and geometric moments of inertia.

7. Learning outcomes ¹⁴

Knowledge	<p>The student /graduate:</p> <ul style="list-style-type: none"> - solves elementary vector-calculus problems; - applies vector calculus to problems involving the reduction of force systems; - identifies the types of constraints applied to a rigid body; - defines the condition of static equilibrium for a rigid body; - determines the reactions corresponding to the constraints; - identifies the optimal method for solving static equilibrium in systems of rigid bodies; - determines the constraint reactions in systems of rigid bodies based on static-equilibrium conditions; - determines the position of the center of mass for homogeneous planar sections; - computes the geometric moments of inertia for homogeneous planar sections with an axis of symmetry.
Skills	<p>The student /graduate:</p> <ul style="list-style-type: none"> - understands the fundamental concepts of statics; - assimilates notions such as force, moment of a force about a point, equilibrium, ideal constraints, center of mass, and geometric moment of inertia; - accurately represents the forces and moments acting on bodies; - identifies the type of problem and the appropriate solution methods; - uses vector calculus in the study of force systems and in solving rigid-body equilibrium problems; - applies appropriate mathematical methods when solving problems; - evaluates equilibrium conditions for both rigid bodies and systems of rigid bodies; - selects efficient strategies depending on the nature of the problem; - interprets the numerical results obtained and critically assesses the advantages of the chosen method; - uses the necessary geometric data to compute relevant physical parameters (position of the center of mass, geometric moments of inertia); - writes required materials coherently and presents problem solutions in a readable, structured, and organized manner.
Responsibility and autonomy	<p>The student /graduate:</p> <ul style="list-style-type: none"> - respects ethical principles, norms, and values by completing professional tasks correctly and on time, adopting a rigorous, efficient, and responsible work strategy when making decisions to solve problems; - integrates effectively into the work group and applies techniques for collaboration and efficient teamwork; - continuously updates their knowledge in their field of activity by appropriately using effective learning methods and techniques.

8. Teaching strategies

In teaching activities, methods such as traditional lectures and heuristic discussions will be used, as well as debates based on electronic materials provided to the students. These materials include demonstrations, images, and sketches, accompanied by video resources illustrating the studied concepts. Each class will begin with a brief review of the topics covered in the previous session.

The teaching approach also relies on active learning methods, such as solving exercises and problems.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Introduction. The object of Mechanics. The main chapters of Mechanics. Models used in Mechanics. The principles of Classical Mechanics. Vectors; vector operations.	Academic lecture. Heuristic discussion.	2 hours
9.1.2. Force Systems. The force acting at a rigid body. The moment of a force about a point and about an axis. Equivalent force systems. Invariant quantities. The central axis. The reduction of a force system. Particular force systems. The center of a parallel force system. Examples.		4 hours
9.1.3. Center of Mass and Moments of Inertia. The center of mass of a rigid body. The centroid of a homogeneous planar plate. The Pappus-Guldin theorems. Geometric moments of inertia and mass moments of inertia. The variation of the moments of inertia		8 hours

with respect to parallel axes and with respect to inclined axes. Principal centroidal moments of inertia. Calculations of moments of inertia for various bodies that are used in civil engineering. Examples.		
9.1.4. Statics of the Rigid Body. The equilibrium of a free rigid body. The constrained rigid body. Ideal constraints (the simple support, the pin support, the fixing, the cable and the rigid rod). The equilibrium of the constrained rigid body. The vector and scalar equations of equilibrium. Examples.	Academic lecture. Heuristic discussion	6 hours
9.1.5. Statics of Systems of Rigid Bodies. External and internal constraints. The vector and scalar equations of equilibrium for a mechanical system. Statically determinate systems. The theorem of solidification, the theorem of equilibrium of parts of a system of rigid bodies. Methods used in statics of systems of rigid bodies. Examples.		8 hours
Reading list for the lecture: 1. Beer, F., ș.a. – Vector Mechanics for Engineers. Statics, 8th Ed., McGraw-Hill, New York, 2007; 2. Bejan, L. – Elemente de mecanică teoretică, Editura Performantica, Iași, 2021; 3. Hangan, S., Slătineanu, I. – Mecanică, Ed. Didactică și Pedagogică, 1983; 4. Hibbeler R. C. – Engineering Mechanics. Statics, Fifteenth Edition, Pearson, 2022; 5. Irnicu, N., ș.a. – Curs de mecanică, Institutul Politehnic Iași, 1992; 6. Meriam, J. L., Kraige, L. G. - Engineering Mechanics. Statics, Seventh Edition, John Wiley & Sons, 2012; 7. Vasilescu, A. – Complemente de Mecanică - curs și aplicații pentru ingineri, Ed. Conspress, București, 2000; 8. Vălcovici, V., ș.a. – Mecanica teoretică, Ed. Tehnică, București, 1968; 9. Voinea, R., ș.a. – Mecanica, Ed. Didactică și Pedagogică, București, 1983; 10. Voinea, R., ș.a. – Introducere în mecanica solidului cu aplicații în inginerie, Ed. Academiei Republicii Socialiste România, 1989		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
9.2.1. Force Systems. Finding the resultant force and the resultant moment of a force system. The cases of reduction for systems of forces. The central axis and the minimum resultant moment. Particular force systems (parallel forces, coplanar forces).	Academic lecture. Heuristic discussion. Inferring as a learning method.	4 hours
9.2.2. Center of Mass and Moments of Inertia. The centroid of composite homogeneous planar plates. Geometric moments of inertia. The variation of the moments of inertia with respect to parallel axes and with respect to inclined axes. Principal centroidal moments of inertia.		4 hours
9.2.3. Statics of the Rigid Body. The constrained rigid body. Ideal constraints (the simple support, the pin support, the fixing, the cable and the rigid rod). The equilibrium of the constrained rigid body. The vector and scalar equations of equilibrium.		2 hours
9.2.4. Statics of Systems of Rigid Bodies. External and internal constraints. The vector and scalar equations of equilibrium for a mechanical system. Methods used in statics of systems of rigid bodies		4 hours
Reading list for the seminar 1. Bălan, Ș. – Culegere de probleme de mecanică, Ed. Tehnică, București, 1964; 2. Buchholtz, N. N., ș.a. – Culegere de probleme de mecanică rațională, Ed. Tehnică, București, 1952; 3. Hibbeler R. C. – Engineering Mechanics. Statics, Fifteenth Edition, Pearson, 2022; 4. Vasilescu, A. – Complemente de Mecanică - curs și aplicații pentru ingineri, Ed. Conspress, București, 2000; 5. Vasilescu, A. – Îndrumător și aplicații la mecanică, Partea I: Statica, Ed. Conspress, București, 2004.		

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 and fluency. Capacity for analysis and personal interpretation. Level of command of specialised terminology and communication skills. Ability to process data and solve the problems presented.	- systematic observation of students (individual assignments)	20%	60% (minimum grade 5)
		- summative assessment test (final assessment)	80% (minimum grade 5)	
10.5a Seminar	Ability to apply acquired knowledge. Capacity for analysis, personal interpretation.	- active participation in the activities; - assessment test.		40%

10.6 Passing requirements

- identify the constraints applied to a rigid body, determine the corresponding reactions, and explain the method for solving a rigid-body statics problem;
- determine the method used to calculate the reactions in a system of rigid bodies;
- find the coordinates of significant points when determining the center of mass of a homogeneous planar surface;
- calculate the geometric moments of inertia for simple surfaces with an axis of geometric symmetry.

The final grade 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 Corneliu Eugen ȘFARTZ, PhD

Seminar instructor: Associate Professor Corneliu Eugen ȘFARTZ, PhD

Date of departmental approval: September 2025
Head of Department,
Associate Professor Corneliu Eugen ȘFARTZ, 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	Department of Civil and Industrial Engineering (CCI)
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	Materiale de construcții 1 Building Materials 1						
2.1.2. Course code	CE104						
2.2 Lecture instructor	Lecturer Livia - Ingrid DIACONU, PhD						
2.3 Laboratory instructor	Lecturer Livia - Ingrid DIACONU, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	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	2	3.2 lecture	1	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	28	3.5 lecture	14	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										16
Additional research in the library, on specialised electronic platforms, and in the field										16
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	47									
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	Face-to-face teaching at the faculty: blackboard, projector, specific teaching materials. Online synchronous teaching (Google Meet, Microsoft Teams, Zoom – academic licenses), with necessary equipment (computer, camera, microphone, speakers /headset, Internet connection); Students must comply with the Student Rights and Obligations Code and with the regulations of the University Charter of the “Gheorghe Asachi” Technical University of Iași.
5.2 for the seminar / laboratory / project ¹³	On-site applied activities: computers, software packages, experimental stands, etc.; Online synchronous activities with full video-conference technical requirements; Deadlines for assignments are set at the beginning of the semester by the teaching staff;

6. General objective of the course

Building Materials 1 provides the fundamental concepts used to characterize, analyze, and apply construction materials. The theoretical component focuses on terminology and essential concepts, while laboratories highlight key material properties through practical experiments. The course prepares future civil engineers from the perspective of material users, not manufacturers.

7. Learning outcomes¹⁴

Knowledge	The student /graduate: <ul style="list-style-type: none"> - identifies and explains construction materials; - identifies and defines types of structural elements; - evaluates, selects, and recommends optimal use of materials in construction elements; - explains properties and application technologies for civil, industrial, and agricultural construction materials; - understands laboratory methods for determining technical characteristics of construction materials.
Skills	The student /graduate: <ul style="list-style-type: none"> - applies efficient and responsible work strategies, based on professional ethics; - works effectively in teams; - acquires technical knowledge required for qualitative certification of materials used on construction sites; - interprets technical characteristics in terms of quality and durability requirements; - makes decisions regarding material use according to quality.
Responsibility and autonomy	The student /graduate: <ul style="list-style-type: none"> - selects and analyses bibliographic sources; - demonstrates autonomous learning; - respects ethics and deadlines in professional tasks, applying rigorous and responsible work principles; - integrates within a work group and uses appropriate communication techniques in multidisciplinary teams; - stays informed and continuously documents developments in the field, using adequate learning tools.

8. Teaching strategies

Teaching uses participative lectures and discussions supported by PowerPoint presentations. After each lecture, students receive a document containing all presented information. Presentations include images and sketches for better understanding. Each lecture begins with a short review of previous concepts.

Teaching also uses discovery-based learning, both through direct and indirect exploration (experiments, demonstrations, modelling), as well as applied methods such as practical activities and problem-solving.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
I. General properties of construction materials. Terminology. General principles for determining technical characteristics. I.1 Physical properties I.2 Mechanical properties I.3 Deformability properties	Interactive lecture, debates, explanations	6 hours
II. Natural stone. Main minerals. Rock classification and characteristics. Natural stone materials for construction. Aggregates.		2 hours
III. Ceramic products. Clays (composition, structure, behaviour in contact with water). Behaviour when heated. Principles of ceramic product manufacturing. Ceramic materials and products. Ceramic aggregates.		2 hours
IV. Glass. Manufacturing principles. Types of glass. Glass construction products.		1 hour
V. Metals. Iron and its alloys. Basics of metallurgy. Characteristics of Fe-C alloys. Cast iron and steel products for construction. Non-ferrous metals and alloys. Metal corrosion and protection principles.		3 hours
Reading list for the lecture: 1. Groll L., Hîrhui I., s.a., Materiale pentru construcții – Bazele fizico – chimice ale studiului materialelor de construcții, I.P.I. „Gh. Asachi” Iași, 1988		

2. Mircea Rujanu, Livia-Ingrid Groll, Materiale de construcții, Ed. Gh. Asachi, ISBN-973-9178-76-7, 200 pag, Iași, 1999
3. Ioan Hîrhui, Liviu Groll, Dănuț Babor, Materiale de construcții, Ed. VESPER, ISBN 973-96589-5-4, 279 pag, Iași, 1997
4. M. Rujanu - Materiale de construcții – ED. SPIRU HARET – Iasi -2011
5. Dănuț Babor - Studiul Materialelor de Construcții – Editura Societății Academice ‘Matei Teiu Botez’ ISBN 978-973-8955-33-2
6. Course support in Microsoft PowerPoint – 2025 edition

9.2b Laboratory	Work methods ¹⁷	Observations, allotted time
Laboratory 1 Measuring devices and control instruments used in the laboratory. Practical use of laboratory equipment; analysis and testing; processing experimental data.	Practical demonstration, experiments	2 hours
Laboratory 2 General physical characteristics of materials. Densities (real, apparent). Structural characteristics.		2 hours
Laboratory 3 Characteristics of granular materials. Bulk density, void volume, sand bulking.		2 hours
Laboratory 4 Granulometry. Fineness modulus.		2 hours
Laboratory 5 Natural stone.		2 hours
Laboratory 6 Ceramic products.		2 hours
Laboratory 7 Metal.		2 hours
Reading list for the laboratory: <ol style="list-style-type: none"> 1. Mircea Rujanu, Laboratorul materialelor de construcții, ISBN 9975-63-096-0, 217 pagini, Ed. Tehnică-Info, Chișinău, 2002 2. Mircea Rujanu – Încercarea unor materiale de construcții, 134 pag., Editura ”TERRA NOSTRA”, ISBN 978-973-8432-63-5, 2007 3. Dănuț Babor -Studiul Materialelor de Construcții – Editura Societății Academice ‘Matei Teiu Botez’ ISBN 978-973-8955-33-2 4. Laboratory activity sheets in PDF format – 2025 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 or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	-	70%
		- formative assessment test (tests during the semester)	-	
		- summative assessment test (final assessment)	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 laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		30%
10.6 Passing requirements - Minimum grade 5 on final evaluation. - Minimum grade 5 on laboratory work (laboratory colloquium and evaluation of activity portfolio). - Minimum grade 5 as a final grade, resulting from the weighted average of the grades obtained in the previously - described evaluations.				
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 Livia - Ingrid DIACONU, PhD

Laboratory instructor:

Lecturer Livia - Ingrid DIACONU, 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) x 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	Civil and Industrial Buildings
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	Geometrie descriptivă Descriptive Geometry						
2.1.2. Course code	CE105						
2.2 Lecture instructor	Lecturer Vanda - Ligia DĂNĂILĂ, PhD						
2.3 Seminar instructor	Lecturer Vanda - Ligia DĂNĂILĂ, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	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	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		3.6d	
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										6	
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, specific teaching materials for the discipline Students will follow the Code of student’s rights and obligations and the Regulations required by the Charta of “Gheorghe Asachi” Technical University of Iași
5.2 for the seminar ¹³	Blackboard, specific teaching materials for the discipline The deadlines for submission of the tests are settled by the instructors and are communicated to students the beginning of the semester Students will follow the Code of student’s rights and obligations and the Regulations required by the Charta of “Gheorghe Asachi” Technical University of Iași

6. General objective of the course

The study of this discipline allows assimilation of basic notions of Descriptive Geometry, that represents the foundation of Technical Drawing which enable engineers to graphically express technical conceptions. Appropriating principles and methods to draw up plane projections of geometric solids, training spatial sight represent an important target of Descriptive Geometry. Achieving this goal is accomplished by studying the projection methods of geometric elements, by identifying the geometric solids and drawing up their draughts, by plotting the intersections of solids, by spatial reconstitution of geometric solids based on their plane plotting.

7. Learning outcomes

Knowledge	The student / graduate: <ul style="list-style-type: none"> - identifies and describes concepts, principles and main methods in geometry and technical drawing; - explains and interprets theoretical and experimental results in geometry and technical drawing; - compares and discerns the related notions and their properties in geometry and technical drawing; - formulates observations and discerns notions, properties and assertions in geometry and technical drawing using examples and counter-examples.
Skills	The student / graduate: <ul style="list-style-type: none"> - operates with concepts, principles and main methods in geometry and technical drawing; - solves descriptive geometry problems with practical use in engineering and validates the problem solution; - provides examples of using the concepts and basic theoretical results in descriptive geometry and technical drawing; - performs engineering calculations of medium complexity associating them with graphic plottings
Responsibility and autonomy	The student / graduate: <ul style="list-style-type: none"> - applies ethical and deontological values of engineering profession; - practices logical reasoning, assessment and self-assessment in decision making; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; - efficiently communicates about activities associated with engineering with a wide range of public; - promotes dialogue, cooperation, and respect for the others and interculturalism; - efficiently works as a member of a team or as the leader of it.

8. Teaching strategies

The teaching activities include interactive lectures and debates based on studied theoretical concepts presented along with examples adequate to each topic. The presentations contain a large number of explanatory images drawn at the same time with students, 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 (demonstrations), as well as action-based methods, such as exercises and problem-solving.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Introduction: Short history. Projection systems: central projection system and parallel projection system.	Interactive lecture, debates, explanations	1 hour
9.1.2. The point: Plotting of a point in double orthogonal projection. Plotting of a point in treble orthogonal projection. Characteristic positions of a point. Descriptive alphabet of a point.		3 hours
9.1.3. The line: Line's projections. Line's traces. Characteristic positions of a line. Relative positions of two lines. Finding the true length of a line segment.		4 hours
9.1.4. The plane: Generating a plane. Plane's traces. Planes parallel to projection planes. Planes perpendicular to projection planes. Relative positions of two planes.		4 hours
9.1.5. The line and the plane: Finding the distance between a point and a plane. Visibility in draught.		2 hours
9.1.6. Methods of Descriptive Geometry: Method of replacing the projection planes. Method of revolution. Method of folding.		3 hours

9.1.7. Polyhedra: Plotting of polyhedra. Plane sections through polyhedra. Development of polyhedral surfaces. Intersection of a line with a polyhedron. Polyhedra intersections.	Interactive lecture, debates, explanations	11 hours
Reading list for the lecture: 1. Dănăilă, V. L., Descriptive Geometry, Ed. PIM, Iași, 2019 2. Dănăilă, V. L. – Descriptive Geometry – platform www.learning.tuiasi.ro , 2018 3. Dănăilă, V. L., Practical Geometry, Lap Lambert Academic Publishing, Saarbrücken, Germany, 2013 4. Dănăilă, V. L., Anghel, A., Descriptive Geometry, Ed. Tehnopress, Iași, 2006 5. Prună, L., Slonovschi, A., Antonescu, I., Geometrie Descriptivă, Ed. Societății Academice „Matei – Teiu Botez”, Iași, 2006 6. Slonovschi, A., Prună, L., Antonescu, I., Geometrie Descriptivă. Aplicații, Ed. Tehnopress, Iași, 2006 7. Anghel, A., Dănăilă, V. L., Geometrie Descriptivă, Ed. Performantica, Iași, 2004 8. Mănescu, M., Rizea, N., Mănescu, C., Geometrie Descriptivă. Aplicații, Ed. Didactică și Pedagogică, București, 1996 9. Precupețu, P., Dale, C., Geometrie Descriptivă Cu Aplicații În Tehnică, Ed. Tehnică, București, 1987 10. Matei, A., Gaba, V., Tacu, T., Geometrie Descriptivă, Ed. Tehnică, București, 1982		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
9.2.1 The point: Exercises and problems regarding the point.	Debates, explanations, solving exercises and problems	2 hours
9.2.2 The line: Exercises and problems regarding the line.		4 hours
9.2.3 The plane: Exercises and problems regarding the plane. Synthetic problems from chapters regarding the point, the line, the plane.		6 hours
9.2.4 Test 1: Problems from chapters regarding the point, the line, the plane.	Solving exercises, deadline submission the end of the 2 hours	2 hours
9.2.5 Methods of Descriptive Geometry: Exercises and problems regarding the methods of Descriptive Geometry.	Debates, explanations, solving exercises and problems	2 hours
9.2.6 Polyhedra: Problems regarding plane sections through polyhedra and the development of polyhedral surfaces.		4 hours
9.2.7 Test 2: Problems from chapters regarding plane sections through polyhedra and the development of polyhedral surfaces.	Solving exercises, deadline submission the end of the 2 hours	2 hours
9.2.8 Polyhedra: Problems regarding intersections of polyhedra.	Debates, explanations, solving exercises and problems	4 hours
9.2.9 Colloquium: Problems regarding intersections of polyhedra.	Solving exercises, deadline submission the end of the 2 hours	2 hours
Reading list for the seminar: 1. Dănăilă, V. L., Descriptive Geometry, Ed. PIM, Iași, 2019 2. Dănăilă, V. L. – Descriptive Geometry – platform www.learning.tuiasi.ro , 2018 3. Dănăilă, V. L., Practical Geometry, Lap Lambert Academic Publishing, Saarbrücken, Germany, 2013 4. Dănăilă, V. L., Anghel, A., Descriptive Geometry, Ed. Tehnopress, Iași, 2006 5. Prună, L., Slonovschi, A., Antonescu, I., Geometrie Descriptivă, Ed. Societății Academice „Matei – Teiu Botez”, Iași, 2006 6. Slonovschi, A., Prună, L., Antonescu, I., Geometrie Descriptivă. Aplicații, Ed. Tehnopress, Iași, 2006 7. Anghel, A., Dănăilă, V. L., Geometrie Descriptivă, Ed. Performantica, Iași, 2004 8. Mănescu, M., Rizea, N., Mănescu, C., Geometrie Descriptivă. Aplicații, Ed. Didactică și Pedagogică, București, 1996 9. Precupețu, P., Dale, C., Geometrie Descriptivă Cu Aplicații În Tehnică, Ed. Tehnică, București, 1987 10. Matei, A., Gaba, V., Tacu, T., Geometrie Descriptivă, Ed. Tehnică, București, 1982		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final 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	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)		50% (minimum grade 5)
		- formative assessment test (tests during the semester)	50%	

	Ability to process data and solve the problems presented	- summative assessment test (final assessment)	50%	
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities		50% (minimum grade 5)
10.6 Passing requirements				
The student must be able to accurately draw the draughts of points, straight lines and planes using the coordinates of points. The student must know how to identify and draw the draughts of polyhedra, using the coordinates of polyhedra's vertices.				

Date of completion: September 2025

Lecture instructor:

Lecturer Vanda - Ligia DĂNĂILĂ, PhD

Seminar instructor:

Lecturer Vanda - Ligia DĂNĂILĂ, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Liviu PRUNĂ, 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	Department of Civil and Industrial Engineering (CCI)
1.4 Field of study	Civil Engineering
1.5 Level of study ¹	Bachelor's degree
1.6. Study programme	ICE – Civil Engineering in English Language

2. Course information

2.1.1 Course title		Chimie Chemistry					
2.1.2. Course code		CE106					
2.2 Lecture instructor		Lecturer Livia - Ingrid DIACONU, PhD					
2.3 Laboratory instructor		Lecturer Livia - Ingrid DIACONU, PhD					
2.4 Year of study ²	1	2.5 Semester ³	1	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										12	
Additional research in the library, on specialised electronic platforms, and in the field										10	
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 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	Face-to-face teaching at the faculty: blackboard, projector, specific teaching materials; Online synchronous teaching (Google Meet, Microsoft Teams, Zoom – academic licenses), with necessary equipment (computer, camera, microphone, speakers/headset, Internet connection); Students must comply with the Student Rights and Obligations Code and with the regulations of the University Charter of the “Gheorghe Asachi” Technical University of Iași.
5.2 for the seminar / laboratory / project ¹³	On-site applied activities: computers, software packages, experimental stands, etc.; Online synchronous activities with full video-conference technical requirements; Laboratory work is performed after verifying acquired knowledge and associated laboratory notes.

6. General objective of the course

Knowledge of the main aspects regarding the physico-chemical bases of the study of construction materials. Acquiring study methods for determining the physico-chemical structure of construction materials and their general properties, together with standardized procedures for determining technical characteristics. Emphasis is placed on highlighting the link between chemical composition, structure, and properties of substances that make up construction materials. Knowing the chemical composition and main technical characteristics of construction and installation materials for qualitative assessment of materials used on site. Interpretation of technical characteristics from the perspective of achieving quality and durability requirements.

7. Learning outcomes¹⁴

Knowledge	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - identifies and explains fundamental elements of construction materials chemistry; - evaluates analytical data in statistical terms (estimations of the types of errors encountered in chemical analysis, evaluates the effects of systematic errors upon analytical results, determines detection limits, interprets statistical tests); - defines the general properties of employed substances (for example, hydrochloric acid, sulphuric acid, caustic soda, slaked/unslaked lime etc.) and utilizes computations for concentrations, solute mass etc.; - describes salts and buffer solutions; - uses and interprets titrations or other types of reactions; - the acquired knowledge and skills will also be used in laboratory practical work within the “Building Materials” disciplines.
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - uses digital tools for presenting chemistry work; - operates laboratory equipment used for structural and physico-chemical characterization of chemical substances; - masters several basic techniques used in chemical analysis laboratories; - recognizes and characterizes used substances (many being construction materials themselves).
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - respects ethical principles, norms, and values in performing professional tasks correctly and on time, using rigorous and efficient work strategies and responsible decision-making; - integrates into the workgroup and applies effective relationship and teamwork techniques in multidisciplinary teams; - informs and documents continuously in their own field, using adequate long-life learning methods; - learns the first steps in drafting engineering-related works.

8. Teaching strategies

Teaching uses participative lectures and discussions supported by PowerPoint presentations. After each lecture, students receive a document containing all presented information. Presentations include images and sketches for better understanding. Each lecture begins with a short review of previous concepts.

Teaching also uses discovery-based learning, both through direct and indirect exploration (experiments, demonstrations, modelling), as well as applied methods such as practical activities and problem-solving.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
I. Introductory notions. Subject of the course. Correlation with profile disciplines. Evolution of construction and building services materials industry.	Interactive lecture (Power Point), debates, explanations	1 hour
II. Structure of matter as determinant of physico-chemical and mechanical properties. Atoms, ions: structure, properties. Chemical bonds.		4 hours
III. Organic compounds – polymers. Silicates. Carbonates.		5 hours

IV. Systems of substances and their properties. Homogeneous systems (water, liquid solutions, solid solutions, concentrations). Heterogeneous systems. Phase equilibrium.		4 hours
V. States of matter. Solid state. Liquid state. Gaseous state. Phase transformations.	Interactive lecture (Power Point), debates, explanations	4 hours
VI. Colligative properties of systems. Colloidal systems. Physico-chemical properties of composite materials.		5 hours
VII. Notions of chemical kinetics. Chemical reactions in homogeneous and heterogeneous systems. Corrosion of materials.		5 hours
Reading list for the lecture: 1. Loredana Judele – <i>Chemistry Course for Civil Engineering</i> , 140 pp., PIM Publishing, 2022 2. Liviu Groll, Livia Ingrid Groll, Loredana Judele – <i>Chemistry for Construction Engineers</i> , 170 pp., Matei Teiu Botez Academic Society Publishing, ISBN 978-973-8955-21-9, Iași 2007 3. Iluțiu-Varvara, D.A. – <i>Installation Materials and Applied Chemistry</i> , UT Press, Cluj-Napoca, 2016, ISBN 973-606-737-167-3, 448 pp. 4. Adina Berbecaru, <i>Chemistry Course</i> , CONSPRESS, Bucharest, 2017, ISBN 978-973-100-450-1, 184 pp.		
9.2b Laboratory	Work methods ¹⁷	Observations, allotted time
Laboratory 1 - Labor protection norms in chemistry laboratories. Presentation of equipment and materials.	Practical demonstration, experiments	2 hours
Laboratory 2 - Notions of chemistry.		2 hours
Laboratory 3 - Liquid solutions (concentrations, preparation methods, determination of concentrations).		2 hours
Laboratory 4 - Water analysis		2 hours
Laboratory 5 - Determining viscosity – Engler method.		2 hours
Laboratory 6 - Corrosion of metals.		2 hours
Laboratory 7 - Laboratory colloquium.	End of activity by oral/on-line testing of acquired knowledge.	2 hours
Reading list for the laboratory: 1. Loredana Judele, <i>Laboratory Guide for Chemistry Works</i> , PIM Publishing, ISBN 978-606-13-7888-3, 83 pp., Iași 2023 2. Mircea Rujanu – <i>Construction Materials: General Technical Characteristics, Production, Testing, and Use</i> , 512 pp., SPIRU HARET Publishing, 2011		

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	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	-	70%
		- formative assessment test (tests during the semester)	-	
		- summative assessment test (final assessment)	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 laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		30%
10.6 Passing requirements - Minimum grade 5 on final evaluation; - Minimum grade 5 on laboratory work (laboratory colloquium and evaluation of activity portfolio); - Minimum grade 5 as a final grade, resulting from the weighted average of the grades obtained in the previously-described evaluations.				

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 Livia - Ingrid DIACONU, PhD

Laboratory instructor: Lecturer Livia - Ingrid DIACONU, 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) x 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	Programarea Calculatoarelor și Limbaje de Programare Computer Programming and Programming Languages						
2.1.2. Course code	CE107						
2.2 Lecture instructors:	Lecturer Cerasela - Panseluța NEAGU, PhD Lecturer Gabriela COVATARIU, PhD						
2.3 Laboratory instructor:	Lecturer Cerasela - Panseluța NEAGU, PhD Lecturer Gabriela COVATARIU, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	2.6 Assessment method ⁴	Vp	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	2	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		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										7	
Additional research in the library, on specialised electronic platforms, and in the field										5	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										7	
Assessment ⁸											
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, internet connection, software access; Students must comply with the Student Rights and Obligations Code and with the regulations of the University Charter of the “Gheorghe Asachi” Technical University of Iași
5.2 for the seminar / laboratory / project ¹³	Access to laboratories with individual computers, specific software e.g. MS Office, Matlab, internet connection; Deadlines for assignment submission will be established by the lectures and communicated at the beginning of the semester.

6. General objective of the course

In this course you will learn how to use different computer programs for solving different engineering problems. The main focus will be in learning on how to edit a technical material using WORD, how to perform engineering computations using Spread sheets in Excel, how to solve different problems using flowcharts and how to create a program for solving engineering problems. These topics play an essential role in the engineering development of each student. The theoretical component of this lecture will provide you with an overview of the modern approach and techniques used in civil engineering for solving different problems. You will have the possibility to apply what you learn by performing tests, using the techniques mentioned above.

7. Learning outcomes ¹⁴

Knowledge	<p>The student / graduate:</p> <ul style="list-style-type: none"> - explains the fundamental elements of computer programming and the use of different applications; - compares basic functions in Word, Excel, and Matlab for solving technical problems; - evaluates advantages of using digital tools in engineering; - defines notions as algorithm, flow chart, and control structure; - describes steps for creating documents, computing sheets, and simple programs; - performs computations in Excel and Matlab; - applies programming principles for solving engineering problems.
Skills	<p>The student / graduate:</p> <ul style="list-style-type: none"> - uses Word and Excel for writing different materials and data analysis; - plans the structure of the documents and organize information in table sheets and graphs; - operates with Matlab for algorithm implementation and numerical computation; - critically evaluates the data correctness and results obtained using different software.
Responsibility and autonomy	<p>The student / graduate:</p> <ul style="list-style-type: none"> - 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 documents and simple programs according to the assignments.

8. Teaching strategies

The teaching activities will include interactive lectures and debates based on PowerPoint presentations and practical demonstrations that will be made available to students. The presentations contain images, diagrams and case studies 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 (demonstrations), as well as action-based methods, such as exercises, practical activities, and problem-solving.

9. Content

9. 1. Lecture¹⁵	Teaching strategies	Time allocation
<p>9.1.1. Introduction in informatics</p> <ul style="list-style-type: none"> - Data & information processing history in engineering with specific application in civil engineering - Computer competence. Hardware and software. Data processing and saving. - Operation systems and software applications. - Presentation of Google Meet, Microsoft Teams, Zoom, Classroom. 	Interactive lecture, debates, explanations	2 hours
<p>9.1.2. Using of computer programs in solving office and engineering problems</p> <ul style="list-style-type: none"> - texts editors, formulae, tables and basic graphics - MS Word - data processing using table sheet – MS Excel. 		8 hours
<p>9.1.3. Solving of engineering problems using computers</p> <ul style="list-style-type: none"> - Solving stages of engineering processes using computers 		6 hours

- Algorithms: history, definition, examples - Flow charts; Graphical symbols - Linear and branch flowcharts; Loop low charts.		
9.1.4. Programming languages - Programming languages history and types. - Example of programming languages used in civil engineering (Python, Matlab, Excel, C++/C#, SQL) - Artificial intelligence	Interactive lecture, debates, explanations	4 hours
9.1.5. Matlab - Basic notions of Matlab Programming - Elemental operations with matrices in Matlab - Programming principles and basic instructions in Matlab; Graphs in Matlab.		6 hours
9.1.6. Review		2 hours
Reading list for the lecture: 1. Microsoft Word for Beginners: 4-Hour Training Course in Word 2021/365, https://www.youtube.com/watch?v=wy7Hj84MCeA . 2. Microsoft Excel Tutorial for Beginners - Full Course, https://www.youtube.com/watch?v=V10H-qTclOg . 3. Draw.io – flowchart software - https://www.diagrams.net/ , https://www.youtube.com/channel/UCiTiRN9b8P4CoSfpgEJHA . 4. MATLAB The Language of Technical Computing - https://www.mathworks.com/help/matlab/index.html?s_tid=hc_panel . 5. MIT – Introduction to Matlab, https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-057-introduction-to-matlab-january-iap-2019/ . 6. MATLAB - MATLAB for New Users - https://www.youtube.com/watch?v=Nw7r4i6Ixi0 . 7. M. Ghinea, V. Fireșteanu, Matlab. Calcul numeric-grafică-aplicații, Editura Teora, București, 2008. 8. MATLAB Onramp, https://matlabacademy.mathworks.com/details/matlab-onramp/gettingstarted 9. V. Florea – suport de curs și lucrări. 10. G. Covatariu – suport de curs – http://edu.tuiasi.ro		
9.2b Laboratory	Work methods ¹⁷	Observations, allotted time
9.2.1 Laboratory presentation and rules of functioning	Discussions	1 hour
9.2.2 Hardware and Software presentation and discussion	Discussions based on specific case studies, explanations, exemplification	1 hour
9.2.3 Text editing – MS Word Text and formula writing and editing. Drawing simple sketches and table editing.	Practical demonstration, exemplification	4 hours
9.2.4 Test at MS Word	Test	2 hours
9.2.5 Data sheets processing – MS Excel	Practical demonstration, exemplification	4 hours
9.2.6 Test at MS Excel	Test	2 hours
9.2.7 Algorithms and flow charts	Practical demonstration, exemplification	4 hours
9.2.8 Test la Algorithms and flow charts	Test	2 hours
9.2.9 Matlab applications	Practical demonstration, exemplification	4 hours
9.2.10 Test at Matlab	Test	2 hours
9.2.11 Review	Discussion & Tests	2 hours
Reading list for the laboratories: 1. Microsoft Word for Beginners: 4-Hour Training Course in Word 2021/365, https://www.youtube.com/watch?v=wy7Hj84MCeA . 2. Microsoft Excel Tutorial for Beginners - Full Course, https://www.youtube.com/watch?v=V10H-qTclOg . 3. Draw.io – flowchart software - https://www.diagrams.net/ , https://www.youtube.com/channel/UCiTiRN9b8P4CoSfpgEJHA . 4. MATLAB The Language of Technical Computing - https://www.mathworks.com/help/matlab/index.html?s_tid=hc_panel . 5. MIT – Introduction to Matlab, https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-057-introduction-to-matlab-january-iap-2019/ . 6. MATLAB - MATLAB for New Users - https://www.youtube.com/watch?v=Nw7r4i6Ixi0 . 7. M. Ghinea, V. Fireșteanu, Matlab. Calcul numeric-grafică-aplicații, Editura Teora, București, 2008. 8. MATLAB Onramp, https://matlabacademy.mathworks.com/details/matlab-onramp/gettingstarted 9. V. Florea – suport de curs și lucrări. 10. G. Covatariu – suport de curs – http://edu.tuiasi.ro		

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 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%
		- formative assessment test (tests during the semester)	100%	
		- summative assessment test (final assessment)		
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)		90%
10.6 Passing requirements Knowledge of use Word, Excel, Matlab; Knowledge of working with flowcharts Knowledge of steps in solving engineering problems using WORD, EXCEL, MALTAB and FLOWCHARTS Minimum 11 attendances at laboratory in order to enter tests; Minimum grade is 5 at each test.				
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

Lecturer Gabriela COVATARIU, PhD

Laboratory instructor:

Lecturer Cerasela - Panseluța NEAGU, PhD

Lecturer Gabriela COVATARIU, PhD

Date of departmental approval:
September 2025

Head of Department,
Lecturer Mircea - Vasile VENGGHIAC, 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	Bazele Proiectării Structurilor Fundamentals of Structural Design						
2.1.2 Course code	CE108						
2.2 Lecture instructor	Lecturer Mircea-Vasile VENGHIAC, PhD						
2.3 Laboratory instructor	Lecturer Mircea-Vasile VENGHIAC, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	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										13	
Additional research in the library, on specialised electronic platforms, and in the field										12	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										8	
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	Blackboard, projector, flipchart, documentary clips, animations, scaled down models
5.2 for the laboratory ¹³	Computing equipment, software packages, experimental setup for axial compression, experimental setup for bending

6. General objective of the course

This course presents in a general way the basics of Construction Engineering. Students learn about different construction types that were constructed during the technological evolution, about structural elements, structural systems, construction materials, creativity in Civil Engineering, building design requirements, different types of actions

and consequently loads applied on constructions. Different case studies are presented (buildings, bridges, construction errors, design errors) starting from the great pyramids in Egypt to Burj Khalifa in Dubai, concentrating on the most remarkable constructions built until today.

7. Learning outcomes¹⁴

Knowledge	<p>The student / graduate:</p> <ul style="list-style-type: none"> - understands the basic principles of static equilibrium and the development of internal forces in structural elements; - knows the main types of loads applied on constructions (permanent, variable, exceptional) and their effects on the stability and strength of constructions; - identifies the basic structural elements (tension members, compression members, beams, trusses, cables and arches) and their behaviour under loading; - knows the general criteria for structural design and the relation between form, function and structure; - describes the basic properties and mechanical characteristics of construction materials (steel, concrete, masonry, wood, iron).
Skills	<p>The student / graduate:</p> <ul style="list-style-type: none"> - applies the basic principles of equilibrium for solving simple problems (identify reactions, evaluate types of stress); - uses theoretical notions to assess advantages and disadvantages of different structural system types; - builds scaled down experimental models and interprets the structural behaviour; - organizes the workflow and resource distribution for the laboratory activities; - correlates the theoretical observations with the real behaviour of the structures, developing critical thinking and engineering analysis; - uses digital tools to evaluate stress type in the members of a truss; - asserts engineering decisions through logical thinking and the correct interpretation of theoretical and experimental data.
Responsibility and autonomy	<p>The student / graduate:</p> <ul style="list-style-type: none"> - integrates efficiently into groups and applies effective relationship-building and teamwork techniques for solving laboratory activities, assuming different roles and responsibilities specific to the group; - 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; - continually seeks information and updates knowledge in their field of activity by using appropriate and effective lifelong learning methods and techniques; - develops clear, logically structured technical reports and presentations that reflect engineering reasoning and own conclusions supported by technical arguments; - demonstrates initiative, autonomy, and perseverance in additional documentation, in solving technical tasks and in improving own performance; - critically evaluates the performance and stability of the analysed structures, demonstrating reflective thinking, analytical spirit, and professional discernment; - plans individual activities and effectively manages time and resources to meet deadlines and project requirements; - 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. Furthermore, during the presentations, the principles are proven by the means of scaled down models and mock-ups.

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 experiments and practical demonstrations completed by practical activities at the laboratory.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Constructions. General Notions. Creativity in Engineering. Evolution of Constructions from Prehistory to Modern Times	Interactive lecture, debates, explanations	4 hours
9.1.2. Learning to See and Understand Structures. The Science of Structures: Equilibrium of Forces		2 hours
9.1.3. The Science of Structures: Internal Forces, Stress and Strength. Material Properties		2 hours
9.1.4. Columns and Beams		2 hours
9.1.5. Trusses, Cables and Arches		2 hours
9.1.6. Loads and Structural Systems. Architectural Styles. Building Design Requirements		2 hours
9.1.7. Egypt to Greece: Pyramids to the Parthenon. The Glory of Rome in Arches and Vaults		2 hours
9.1.8. The Rise and Fall of the Gothic Cathedral. Three Great Domes: Rome to the Renaissance		2 hours
9.1.9. How Iron and Science Transformed Arch Bridges. Case Study: The Construction of the Lupu Arch Bridge, China		2 hours
9.1.10. Suspension Bridges: The Challenge of the Cable and the Challenge of Wind		2 hours
9.1.11. Great Cantilever Bridges. The Rise of Iron and Steel in Frame Buildings		2 hours
9.1.12. The Great Skyscraper Race. The Beauty and Versatility of Modern Concrete		2 hours
9.1.13. Thin Shells. Vast Roof Systems. Tension Structures. Strategies for Understanding Any Structure		2 hours
Reading list for the lecture: 1. Ciornei Al. (2013). <i>Construcții. Mod de gândire</i> , Editura Junimea, Iași 2. Saouma, Victor & Aissa Assia, Zakaria. (2019). <i>Lecture Notes in: Structural Concepts and Systems for Architects</i> 3. Allen, Edward, & Iano, Joseph. (2022). <i>Fundamentals of Building Construction: Materials and Methods</i> , 8th Edition, Wiley 4. Fraternali F., Rimoli J.J. (2025). <i>Tensegrity Systems. Basic Concepts, Mechanical Metamaterials, Biotensegrity</i> , Springer Cham, ISBN: 978-3-031-82282-7 5. Gordon J.E. (2025). <i>Structures: Or Why Things Don't Fall Down</i> , Grand Central Publishing, ISBN: 978-0786730353 6. Stephen Ressler, (2011). <i>Understanding the World's Greatest Structures: Science and Innovation from Antiquity to Modernity</i> , The Great Courses, USA.		
9.2b Laboratory	Work methods ¹⁷	Observations, allotted time
1. Activities presentation. Necessary materials, student team's establishment and activity calendar.	Interactive lecture, explanations	2 hours
2. Application 1 – Part 1: Columns. Building of columns having different transversal sections and lengths. The members will be made of carton/paper and at the end of the lecture they will be tested under simple compression. The results will be discussed and written in a report.	Experimental test, video recording, interactive discussions	2 hours
3. Application 1 – Part 2: Beams. Building of beams having different transversal sections. The members will be made of carton/paper and at the end of the lecture they will be tested under bending. The results will be discussed and written in a report.		2 hours
4. Application 2: Trusses. A truss type will be chosen by each team. The sketch will be made at a 1:2 scale on A3 graph paper. The truss will be modelled in a computer program (truss geometry, support types and loads). The stress state in each truss element is obtained.	Practical work, scale drawings, structure modelling in computational software, interactive discussions	2 hours
5. Application 2: Trusses. The students begin building the truss using the results obtained at the previous lecture.	Practical work, scale drawings, interactive discussions	2 hours
6. Application 2: Trusses. The trusses are tested under bending. The results will be discussed and written in a report.	Experimental test, video recording, interactive discussions	2 hours
7. Portfolio presentation.	Interactive discussions	2 hours
Reading list for the laboratory: 1. Stephen Ressler, (2001). <i>Designing and Building File-Folder Bridges, A Problem-Based Introduction to Engineering</i> , United States Military Academy, West Point, NY 10996.		

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%
		- formative assessment test (tests during the semester)		
		- summative assessment test (final assessment)	90%	
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 - to identify the basic structural elements, to describe the main types of actions and loads (permanent, variable, exceptional), to explain the principles of equilibrium, to describe the basic mechanical properties of construction materials; - to deliver all complete technical reports for the laboratory activities according to the schedule; - to obtain a minimum 5 (five) mark for the final exam and for the laboratory.				
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

Laboratory instructor:

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) x 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/Standard-specific-programme-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	Educație fizică 1 Physical Training 1						
2.1.2. Course code	CE109						
2.2 Lecture instructor							
2.3 Seminar instructor	Lecturer Ady-Constantin RANCEA, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	2.6 Assessment method ⁴	Vp	2.7 Course type ⁵	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	1	3.2 lecture		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	14	3.5 lecture		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										8	
Additional research in the library, on specialised electronic platforms, and in the field										3	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios											
Assessment ⁸										2	
Other activities:											
3.7 Total number of individual study hours ⁹	11										
3.8 Total number of hours per semester ¹⁰	25										
3.9 Number of ECTS credits	1										

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	Synthetic football field, tennis courts, gyms Fitness rooms, specific materials, etc. Students must comply with the Student Rights and Obligations Code and with the regulations of the University Charter of the “Gheorghe Asachi” Technical University of Iași.

6. General objective of the course

The main objective of the **Physical Training 1** course is to increase the students' physical and intellectual capacity, to stimulate the independent practice of physical exercise and to improve basic motor skills. The aim is to strengthen the health and harmonious development of the young people's body, to acquire and consolidate some basic elements and procedures in athletics, gymnastics, sports games, fitness, their application in bilateral games or individual activities; to learn some basic notions related to the regulations for holding various sports competitions.

7. Learning outcomes ¹⁴

Knowledge	The student/ graduate: <ul style="list-style-type: none"> - understands basic concepts regarding the rules and techniques of sports games and gymnastic exercises; - knows the structure and purpose of the main physical exercises and sports practiced within physical education disciplines; - understands the role of physical activity in the physical and mental balance necessary for a demanding engineering career;
Skills	The student/ graduate: <ul style="list-style-type: none"> - Is able to correctly apply technical and tactical elements from athletics, gymnastics, sports games, or fitness; - Actively participate in exercises and applicative games to develop basic motor skills; - Demonstrates physical skills and coordination in the execution of individual or group exercises; - Adapts physical effort to one's own abilities and contributes to team sports activities
Responsibility and autonomy	The student/ graduate: <ul style="list-style-type: none"> - Demonstrates responsibility in complying with regulations, safety standards, and teacher instructions; - Demonstrates autonomy in practicing physical exercise outside of class; - Assumes correct and collaborative behaviour in collective sports activities; - Raises awareness of the importance of physical education in long-term personal and professional development.

8. Teaching strategies

The teaching activity is performed through demonstrations and exercises.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
Reading list for the lecture:		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
1. Sports games: basketball, handball, football, volleyball, badminton: <ul style="list-style-type: none"> - fundamental positions, positioning, and movement on the field; - simple kicks, services, exercises for receiving, catching, and passing the ball from a standing position and from running; exercises for completing basic technical and technical-tactical actions, marking, and marking exercises; - overall participation in games on small and normal fields with effective differences 	Physical activities Exercises and applicative games	7 hours
2. Improving basic motor skills and those specific to certain sports, through the use of bodybuilding, athletics, and fitness equipment: <ul style="list-style-type: none"> - increasing strength and muscle mass through the appropriate and individualized use of weights, dumbbells, and barbells; exercises to adjust the forms and transform fat into active mass; improving the forms of speed manifestation (reaction, repetition, movement, execution through specific exercises); - improving general coordination indices and specific skill in different specific branches; - increasing mobility and suppleness at the level of different segments Increasing running endurance 		7 hours
Reading list for the seminar: 1. Brata Maria,1996, Metodica educației fizice și sportului, vol. I, Universitatea Oradea. 2. Cârstea Gh.,1993, Teoria și Metodica Educației fizice și sportului , Editura Universul, București. 3. Dragnea A. și col.,2006, Educație fizică și sport – teorie si didactica, Editura FEST, București. 4. Dragnea, A., Bota, A., 1999, Teoria activităților motrice, Editura Didactica și Pedagogica, R.A., București. 5. Gaiță D.,Merghes P.; 2002, Primul pas – Principii practice ale antrenamentului fizic în bolile cardiovasculare; Ed Mirton, Timisoara. 6. Hañțiu I., 2011, Teoria educației fizice și sportului, Editura Universității din Oradea, Oradea. 7. Ionescu, A., Mazilu ,V. 1971, Exercițiul fizic în slujba sănătății, Editura Stadion, Bucuresti. 8. Ionescu I.V.1995, Fotbal, Ed. Helicon, Bucuresti. 9. Maroti, Ș., 2008 Baschet, volumul I, Editura Universității din Oradea, Oradea. 10. Maroti ,Ș., 2009 Baschet. Volumul II, Editura Universității din Oradea, Oradea. 11. Merghes P,Țeghuiu A., 2006; Gimnastica medicală pentru prevenirea și corectarea deficiențelor fizice; Ed Mirton, Timisoara. 12. Morun P.;1996, Curs practic de educație fizică și sport. Lito.		

13. Preda O.;1995, Volei la studenți; Ed.Mirton, Timisoara.
 14. Siclovan I.,1979, Teoria educației fizice și sportului, Editura Sport - Turism, București.
 15. Teghiu A., Merghes P, 2009, Deficiențele Fizice-ghid practic” Ed. Eurostampa Timisoara.
 16. Teodorescu, Leon, 1973, Terminologia educației fizice și sportului, Editura Stadion, Bucuresti.
 17. Ulmeanu, Constantin ,1966, Noțiuni de fiziologie cu aplicații la exercițiile fizice, Editura UCFS, Bucuresti

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method	10.3 Percentage of final grade
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities	100%
10.6 Passing requirements The student passes the course on Physical Training I if he demonstrates fundamental practical skills in athletics, gymnastics, sports games, and bodybuilding/ fitness, respectively the ability to correctly and efficiently execute specific techniques, to actively participate in sports activities and to improve his basic and specific motor qualities through individualized training.			
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 instructors:

Lecturer Ady-Constantin RANCEA, PhD

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.

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) x 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		Analiză matematică 2 Mathematical Analysis 2					
2.1.2. Course code		CE110					
2.2 Lecture instructor		Lecturer Sânziana CARAMAN, Dr					
2.3 Seminar instructor		Lecturer Sânziana CARAMAN, Dr					
2.4 Year of study ²	1	2.5 Semester ³	2	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										8	
Additional research in the library, on specialised electronic platforms, and in the field										4	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										7	
Assessment ⁸										6	
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	CE101/ Mathematical Analysis 1
4.2 Learning outcomes prerequisites	To know and to be able to make computations in differential calculus

5. Requirements

5.1 for the lecture ¹²	The classroom will be endowed with video projector, blackboard, and specific materials. The students will respect the Students Rights and Obligations Code and the regulations set out in the Charter of the "Gheorghe Asachi" Technical University of Iasi
5.2 for the seminar ¹³	The classroom will be endowed with video projector, blackboard, and specific materials. Time limits for tests are set by the course organizer.

6. General objective of the course

The general objective is that students acquire a set of mathematical knowledge strictly necessary for the successful completion and understanding of other fundamental or specialized disciplines. In parallel, we aim to develop logical thinking and improve calculation skills, creating a clear image of the importance and role of the discipline in

the training of future specialists. The aim is to acquire knowledge of differential calculus (partial derivatives, extremum problems), numerical series and power series, and general elements of mathematical analysis necessary for the understanding of other fundamental or specialized disciplines and the application of this mathematical knowledge in solving practical problems.

7. Learning outcomes¹⁴

Knowledge	<p>The student/ graduate will:</p> <ul style="list-style-type: none"> - defines the fundamental concepts in the basic disciplines of mathematics; - compares and distinguishes related notions and their properties in the basic disciplines of mathematics; - formulates observations and differentiates notions, properties, and assertions in the basic disciplines of mathematics through examples and counter - examples; - defines the basic concepts in advanced disciplines of mathematics from the curricula; - compares and distinguishes related notions and their properties in advanced disciplines of mathematics from the curricula; formulates observations and differentiates notions, properties, and assertions in advanced disciplines of mathematics through examples and counterexamples; - defines the concepts in the basic disciplines of computer science and/or applied mathematics; - compares and distinguishes related notions and their properties in the basic disciplines of computer science and/ or applied mathematics; - formulates observations and differentiates notions, properties, and assertions from the basic disciplines of computer science and/or applied mathematics through examples and counterexamples; - indicates and recognizes the concepts involved in the requirements of the exercises and problems formulated in the disciplines in the curricula.
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - provides examples of the use of basic theoretical concepts and results when solving exercises and problems formulated in relation to the topics covered in the curriculum disciplines; - recognizes and analyses the necessary and/ or sufficient conditions in the statement of mathematical assertions and specifies their role in the demonstration; - identifies and describes the essential elements in the construction of demonstrations of mathematical assertions (lemmas, propositions, theorems), recognizes reasoning errors and corrects them; - answers questions and correctly and rigorously formulates the statements of mathematical assertions (lemmas, propositions, theorems) in the curriculum disciplines; - reproduces and analyses the hypotheses and conclusions in mathematical assertions and discusses how they can be linked within the demonstration; - argues the role of elements in the hypothesis of mathematical assertions, discusses how these are articulated in the demonstration and independently constructs correct demonstrations of mathematical assertions within the major disciplines of mathematics; identifies and applies appropriate techniques for solving exercises and problems in the major disciplines of mathematics; identifies and applies appropriate techniques for solving problems in advanced disciplines of mathematics; - describes real-world problems in mathematical terms, identifies working hypotheses, constructs appropriate mathematical models, and explains the limitations of the models thus obtained; - uses numerical methods and software packages to solve the constructed mathematical models and interprets the mathematical results thus obtained from the perspective of the practical problem modelled.
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - uses logical thinking, analyses the statement of the problems, selects the specific method of solving them and uses logical schemes and work diagrams in solving problems in the topics covered in the curriculum disciplines; adapts the techniques and strategies for solving routine problems to solving synthesis problems and with a higher degree of complexity and uses various representations to illustrate or justify some methods of solving problems; - makes customizations or generalizations, starting from a given property or problem and individually writes complete solutions to the problems solved in the topics covered; - extends the techniques for solving common problems to problems that arise in new situations and with a progressive degree of difficulty, searches for other methods of solving them and formulates consequences and conclusions that arise from a set of hypotheses; - analyses solution methods, establishes the uniqueness of solutions, recognizes reasoning errors in solving a problem, finds a way to eliminate them and obtain the correct version of the demonstration / solution method;

Responsibility and autonomy	<ul style="list-style-type: none"> - verifies, on particular cases or by constructing examples or counterexamples, the validity of mathematical statements; translates a practical situation into mathematical language, solves the problem obtained and interprets the results obtained; identifies and correlates connections between apparently unrelated concepts from the major disciplines of mathematics; - summarizes, classifies, and presents the conclusions of given problems using various types of representations and clearly and efficiently communicates mathematical concepts and reasoning to specialists and non-specialists through written reports and oral presentations; - solves using analytical and/or numerical methods and uses dedicated software packages or writes codes developed in order to solve practical problems and mathematical models constructed using differential and partial derivative equations or other tools from the curricula covered; - uses independent information and documentation methods, which provide openness to continuous learning, develops scientific communications or scientific reports and makes complete bibliographic references by respecting ethical norms when citing the documentation sources used. The student/graduate approaches problem solving from different angles and directions, including based on non-traditional methodologies, in order to use them in computer science and other applications of mathematics.
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8. Teaching strategies

The teaching activity will use participatory lectures and debates based on presentations (beamer) that will be made available to students. The presentations contain the main concepts and results, 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 full courses and seminars will be made available on the Moodle platform as pdf files.

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).

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Indefinite and definite integrals: Definitions; Methods of computations; Applications; The fundamental theorem of integral calculus	Presentation with video projector. Presentation on the board, interactive lecture, Discussions, Explanations	6 hours
9.1.2. Series of functions: Definition of sequences of functions and series of functions; Power Series: radius of convergence, interval of convergence		2 hours
9.1.3. Improper integrals: Improper integrals on unbounded intervals (of first kind); Improper integrals of unbounded functions (of second kind); Methods of computation		4 hours
9.1.4. Line Integrals: Line integrals with respect to the arc length (of first kind); Line integrals with respect to the coordinates (of second kind)		4 hours
9.1.5. Double integrals: Definition; Methods of computation; The Riemann-Green Formula; The change of variables method; polar coordinates		4 hours
9.1.6. Differential equations: Differential equations of first order; Linear differential equations with constant coefficients, the homogeneous case; The nonhomogeneous linear differential equations with constant coefficients; the method of undetermined coefficients		12 hours
Reading list for the course: <ol style="list-style-type: none"> 1. S. Caraman, Lecture notes on mathematical analysis, Editura Soc. Acad. „Matei-Teiu Botez”, Iași, 2008 2. P. Georgescu, Elemente de calcul diferențial pe dreapta reală, Editura MatrixRom, București, 2012 3. A. I. Lazu, Elemente de analiză matematică (platforma Moodle) 4. R. Luca-Tudorache, Analiză matematică. Calcul diferențial, Tehnopress, Iași, 2005 5. L. Maticiuc, Analiză matematică, Editura Performantica, Iași, 2014. 6. M. Nicolescu, N. Dinculeanu, S. Marcus, Analiză matematică, Vol. I, II, Editura Didactică și Pedagogică, București, 1971 7. S. L. Romaniuc, Elemente de analiză matematică, Editura Performantica, Iași, 2022 8. R. Strugariu, Analiză matematică. Calcul diferențial, Editura Performantica, Iași, 2013 		
9.2b Seminar	Work methods ¹⁷	Observations, allotted time
9.2.1 Indefinite integrals and definite integrals	Discussions, explanations, solving exercises and problems	8 hours
9.2.2. Improper Integrals		4 hours
9.2.3. Line Integrals		4 hours
9.2.4. Double Integrals		6 hours
9.2.5. Differential equations		6 hours

Reading list for the seminar:

1. S. Caraman, Lecture notes on mathematical analysis, Editura Soc. Acad. „Matei-Teiu Botez”, Iași, 2008.
2. P. Georgescu, Elemente de calcul diferențial pe dreapta reală, Editura MatrixRom, București, 2012.
3. A. I. Lazu, Elemente de analiză matematică (platforma Moodle)
4. R. Luca-Tudorache, Analiză matematică. Calcul diferențial, Tehnopress, Iași, 2005.
5. L. Maticiu, Analiză matematică, Editura Performantica, Iași, 2014.
6. M. Nicolescu, N. Dinculeanu, S. Marcus, Analiză matematică, Vol.I,II, Editura Didactică și Pedagogică, București, 1971.
7. S. L. Romaniuc, Elemente de analiză matematică, Editura Performantica, Iași, 2022.
8. R. Strugariu, Analiză matematică. Calcul diferențial, Editura Performantica, Iași, 2013.

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method	10.3 Percentage of final grade
10.4 Exam	Completeness and correctness of knowledge. Logical coherence, fluency, argumentative force. Capacity for analysis, personal interpretation, originality, creativity. Degree of assimilation of specialized language and communication ability. Ability to capitalize on acquired skills. Ability to process data and stated problems.	- formative evaluation test (throughout the semester).	
		- summative evaluation test (final exam).	60%
10.5a Seminar	The ability to apply the knowledge learned in practice. The ability to analyse, personal interpretation, originality, creativity.	- active participation in the activities	40%
10.6 Passing requirements			
The final assessment result for MS1 results from considering the scores and weights assigned to each activity within the discipline. Whole marks from 10 to 1 will be awarded, with a mark of 5 certifying the acquisition of the minimum learning outcomes: determine the primitives of a (simple) function of one variable using the table of primitives, integration by parts, simple substitutions, integration of a rational function; calculate first and second-degree line integrals; solve differential equations with constant coefficients; determine the trigonometric form of a complex number and calculate real/complex integrals using the theory of residues.			

Date of completion: September 2025

Lecture instructor:

Lecturer Sânziana CARAMAN, Dr

Seminar instructor:

Associate Professor Marcel ROMAN, PhD

Date of departmental approval:
September 2025

Head of Department,
Associate Professor Marcel ROMAN, 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) x 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	Algebra și Geometrie 2 Algebra and Geometry 2						
2.1.2. Course code	CE111						
2.2 Lecture instructor	Associate Professor Marcel ROMAN, PhD						
2.3 Seminar instructor	Associate Professor Marcel ROMAN, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	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	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										12	
Additional research in the library, on specialised electronic platforms, and in the field										7	
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	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	CE102/ Algebra and Geometry 1
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. If necessary, teaching activities in synchronous online format (on educational platform Microsoft Teams 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 by the Charter of the "Gheorghe Asachi" Technical University of Iasi.
5.2 for the seminar ¹³	Applied activities in physical format, at the faculty headquarters: computing equipment, software packages, experimental stands, etc.

	<p>If necessary, applied activities in synchronous online format (on educational platform Microsoft Teams with academic subscriptions), with the necessary equipment for a video conference (computer/laptop, video camera, microphone, speakers/headphones, internet connection).</p> <p>The deadlines for submitting the papers are established by the lecturers and are sent to the students at the beginning of the semester.</p>
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6. General objective of the course

The course covers the study of analytic geometry in plane and in 3D space, conics, quadrics and generated surfaces, respectively, differential geometry.

7. Learning outcomes¹⁴

Knowledge	<p>The student / graduate will:</p> <ul style="list-style-type: none"> • know the fundamental theoretical notions of analytic geometry: <ul style="list-style-type: none"> - know the determinations of the line in plane, the corresponding equations, properties; - know the determinations of the plane in 3D space, the corresponding equations, properties; - know the determinations of the line in 3D space, the corresponding equations, properties; - know the metrical properties in plane and in 3D space; - know the definitions of the conics in their general form, the equations, and the properties; - know the definitions of the quadrics in their standard form, the equations, and the properties; • know the basic notions of differential geometry of curves and surfaces.
Skills	<p>The student / graduate will have the following skills:</p> <ul style="list-style-type: none"> - understanding coordinates, quadrants, and plotting points; - converting geometric properties into algebraic equations and vice-versa; - working with point-slope, slope-intercept, and standard forms of linear equations; - calculating angles, distances and areas using coordinates; - making concrete determinations of planes and lines in space described by particular situations; - identifying, graphing, and deriving equations for conic sections; - recognizing the equations of conics in canonical form and making the reduction of general conics to their canonical form; - identifying, graphing, and deriving equations for quadric surfaces; - recognizing the equations of quadrics in canonical form and knowing their symmetry elements; - operating with elements of differential geometry in the case of general curves and surfaces.
Responsibility and autonomy	<p>The student / graduate:</p> <ul style="list-style-type: none"> - 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; - 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 approach uses discovery-based learning models, facilitated by direct and indirect exploration of geometry (heuristic conversation, demonstrations, examples), as well as action-based methods, such as exercises, problem-solving).

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Reference systems and coordinates - Reference systems. Analytic representations of surfaces and curves. Changes of the orthonormal system of coordinates in space and in plane (translations and rotations). Other types of coordinates in space and in the plane: spherical coordinates, elliptical coordinates, cylindrical coordinates, polar coordinates	Interactive lecture, debates, explanations	2 hours

9.1.2. Lines in plane - Analytic representations of the line in plane. Properties (the angle between two lines, orthogonality, parallelism, the distance from a point to a line, relative positions of two (or more) lines). Fascicle of lines.	Interactive lecture, debates, explanations	2 hours
9.1.3. Planes and lines in space - Analytic representations of the plane. Properties (the angle between two planes, orthogonality, parallelism, the distance from a point to a plane). Analytic representations of the line in space. Properties (the angle between two lines, orthogonality, parallelism). Fascicle of planes. Relative positions of two (or three) planes. Relative positions for a line and a plane. The projection of a line to a plane. The angle between a line and a plane. Other analytic representations of the plane. Relative positions of two lines in spaces. The distance from a point to a line in space. The distance between two lines in spaces.		6 hours
9.1.4. Conic sections (Second order algebraic curves in plane) - The common definition of conics as locus. The circle, the ellipse, the hyperbola, the parabola (analytic representations and properties). The study of conics in their general positions. Reduction of the general equation of a conic with center (of symmetry) and without center. Properties: intersections, tangents to a conic from a point, polar line of a conic, diameters, intersection of two conics, fascicle of conics.		6 hours
9.1.5. Analytic geometry of surfaces. Quadric surfaces. Generating surfaces - The sphere: analytic representations, properties, intersections, tangent lines, and tangent of planes to a sphere). Quadric surfaces in their standard positions: the ellipsoid, the one-sheet hyperboloid, the two-sheet hyperboloid, the elliptic paraboloid, the hyperbolic paraboloid, the elliptic cone, the quadric cylinders. The study of quadric surfaces on their general equation. Generating surfaces: conic surfaces, cylindrical surfaces, conoids with directrix plane, rotation surfaces.		6 hours
9.1.6. Notions of differential geometry - Elements of vector calculus. Differential geometry of plane curves: tangent line, normal line, the curvature of a plane curve, plane curves in polar coordinates, multiple points, asymptotes, the envelope of a family of plane curves, the evolute, and the involute of a plane curve. Differential geometry of space curves: the tangent and the normal plane, the osculating plane, and the principal normal line, the binormal line and the rectifying plane, Frenet's mobile trihedron, the elementary arc length, the curvature, and the torsion, Frenet's formulas. Differential geometry of surfaces. The tangent plane and the normal line to a surface. The elementary area of a surface. The angle between two curves on a surface. The first fundamental quadratic form of a surface. The second quadratic form of a surface. The curvature of a curve on a surface.		6 hours
Reading list for the course: 1. D. W. Jordan & P. Smith, „Mathematical Techniques” (third edition), Oxford University Press, ISBN:0 19 924972 5, (2002); 2. M. Roman, (cu C. Frigioiu, V. Balan, C. Udriște (coordonator)), “Algebră liniară, geometrie analitică, geometrie diferențială și elemente de algebra tensorială”, (Linear Algebra, Analytic Geometry, Differential Geometry and Tensorial Algebra), vol 2, StudIS, (2013); 3. A. Cărașu, “Vector Algebra, Analytic and Differential Geometry”, vol.I + II, PIM Publishing House, Iași, (2003); 4. Advanced Engineering Mathematics-NPTEL, http://www.ce.tuiasi.ro ; http://nptel.ac.in/courses/index.php?subjectId=111105035 Moodle: https://edu.tuiasi.ro/pluginfile.php/88317/mod_resource/content/1/ALGAcap7.pdf https://edu.tuiasi.ro/pluginfile.php/88318/mod_resource/content/1/ALGAcap8.pdf https://edu.tuiasi.ro/pluginfile.php/88319/mod_resource/content/1/ALGAcap9.pdf https://edu.tuiasi.ro/pluginfile.php/88320/mod_resource/content/1/ALGAcap10.pdf		
9.2b Seminar	Work methods ¹⁷	Observations, allotted time
9.2.1. Reference systems and coordinates	Explanations, solving problems	1 hour
9.2.2. Lines in plane		1 hour
9.2.3. Planes and lines in space		2 hours
9.2.4. Conic sections		4 hours
9.2.5. Analytic geometry of surfaces. Quadric surfaces. Generating surfaces		3 hours
9.2.6. Notions of differential geometry		3 hours
Reading list for the seminar: 1. A. Cărașu, “Vector Algebra, Analytic and Differential Geometry”, vol. I+II, PIM Publishing House, Iași, (2003). 2. M. Roman, (cu C. Frigioiu, V. Balan, C. Udriște (coordonator)), “Algebră liniară, geometrie analitică, geometrie diferențială și elemente de algebra tensorială”, (Linear Algebra, Analytic Geometry, Differential Geometry and Tensorial Algebra), vol 2, StudIS, (2013). Moodle: https://edu.tuiasi.ro/pluginfile.php/88345/mod_resource/content/1/sem12_14.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	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	20%	70%
		- summative assessment test (final assessment)	80%	
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities - assessment test		30%
<p>10.6 Passing requirements</p> <ul style="list-style-type: none"> • The student will be able to write the equation of a line in the plane, in different determinations. • The student will be able to write the equation of a line in space, in different determinations. • The student will be able to solve problems with lines and planes. • The student will be able to graphically represent conics described by their general equation. • The student will be able to solve problems with circles. • The student will be able to recognize and analytically characterize quadrics by their reduced equation. • The student will be able to solve problems with spheres. • The student will be able to write Frenet's reference for a curve in space. <p>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.</p>				

Date of completion: September 2025

Lecture instructor:

Associate Professor Marcel ROMAN, PhD

Seminar instructor:

Associate Professor Marcel ROMAN, PhD

Date of departmental approval:
September 2025

Head of Department,
Associate Professor Marcel ROMAN, 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) x 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	Mecanică 2 Mechanics 2						
2.1.2. Course code	CE112						
2.2 Lecture instructor	Assistant Professor Corneliu Eugen ȘFARTZ, PhD						
2.3 Seminar instructor	Assistant Professor Corneliu Eugen ȘFARTZ, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	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	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										13	
Additional research in the library, on specialised electronic platforms, and in the field										8	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										9	
Assessment ⁸										3	
Other activities:										3	
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	CE103/ Mechanics 1
4.2 Learning outcomes prerequisites	- skills in calculation and working with basic geometric and algebraic notions; - abilities to think logically and to solve problems.

5. Requirements

5.1 for the lecture ¹²	Room equipped with blackboard, video projector
5.2 for the seminar ¹³	Room equipped with blackboard, video projector

6. General objective of the course

Mechanics 2 is structured in accordance with the faculty’s curriculum, ensuring coherent integration with the other specialized subjects within the study programme. The course emphasizes aligning its content with practical applications covered in related courses and specialized projects. It introduces fundamental notions of the kinematics of a material point (law of motion, trajectory, velocity, acceleration); develops the ability to determine the distributions of

velocities and accelerations in specific motions of the rigid body (translation, rotation about a fixed axis, and general plane motion); presents the fundamental principles of the dynamics of mechanical systems; covers the dynamics of rigid bodies and of systems of rigid bodies; and familiarizes students with basic concepts of analytical mechanics.

7. Learning outcomes ¹⁴

Knowledge	<p>The student /graduate:</p> <ul style="list-style-type: none"> - understands fundamental concepts of kinematics (position vector, law of motion, trajectory, velocity, acceleration); - defines and computes the kinematic characteristics of a material point and of a rigid body; - describes certain particular motions of the rigid body (translation, rotation about a fixed axis, general plane motion) from a kinematic perspective; - identifies the types of motion of the elements of a planar mechanism and determines their absolute and instantaneous centers of rotation; - applies the fundamental principles of dynamics and the general theorems (the theorem of momentum, the theorem of angular momentum, the theorem of work and energy); - determines the inertial, kinematic, and dynamic characteristics of bodies and mechanical systems; - applies d'Alembert's principle to determine the reaction forces in the constraints of mechanical systems by transforming dynamic problems into equilibrium problems.
Skills	<p>The student /graduate:</p> <ul style="list-style-type: none"> - analyzes the motion of a particle, of a rigid body, and of systems of rigid bodies; - defines and computes the position vector, velocities, and accelerations of specified points; - determines the position parameters and the first- and second-order kinematic parameters of the motion of a rigid body; - identifies the instantaneous centers of rotation and uses them to compute the velocities of specified points in a planar mechanism; - selects and applies the appropriate solution method (analytical or graphical) depending on the type of problem; - computes the forces of inertia and the moments of the forces of inertia, and formulates the dynamic equilibrium equations in accordance with d'Alembert's principle; - evaluates the correctness of results by checking units of measurement, dimensional consistency, and physical validity; - collaborates effectively within a team to solve applied problems in kinematics and dynamics.
Responsibility and autonomy	<p>The student /graduate:</p> <ul style="list-style-type: none"> - respects ethical principles, norms, and values by completing professional tasks correctly and on time, adopting a rigorous, efficient, and responsible work strategy when making decisions to solve problems; - integrates effectively into the work group and applies techniques for collaboration and efficient teamwork; - continuously updates their knowledge in their field of activity by appropriately using effective learning methods and techniques.

8. Teaching strategies

In teaching activities, methods such as traditional lectures and heuristic discussions will be used, as well as debates based on electronic materials provided to the students. These materials include demonstrations, images, and sketches, accompanied by video resources illustrating the studied concepts. Each class will begin with a brief review of the topics covered in the previous session.

The teaching approach also relies on active learning methods, such as solving exercises and problems.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Kinematics of the Particle. The fundamentals of Kinematics (trajectory, velocity, acceleration). The motion of a particle with respect to orthogonal Cartesian system of coordinates. Particular motions of a particle.	Academic lecture. Heuristic discussion.	2 hours
9.1.2. Kinematics of the Rigid Body. The position parameters; the first and second order kinematic parameters for the general motion of a rigid body. Particular motions of a rigid body (translation, rotation about a fixed axis, general plane motion).		8 hours

9.1.3. Kinematics of Systems of Rigid Bodies. Basic notions about the structure of mechanical systems (kinematic pairs, kinematic chains, mechanisms). The centers of rotation for a single-degree-of-freedom mechanical system. The collinearity theorems of the centers of rotation.		8 hours
9.1.4. Dynamics of the Particle. The principles of dynamics of the particle. The differential equations of motion of a particle. General theorems of dynamics of the particle (the theorem of momentum, the theorem of angular momentum, the theorem of work and energy).		2 hours
9.1.5. Dynamics of the Rigid Body. Kinetic parameters (linear momentum, angular momentum, kinetic energy). Work, mechanical power. General laws of dynamics of the rigid body. General theorems.		4 hours
9.1.6. Dynamics of Systems of Rigid Bodies. The forces of inertia, the moment of the forces of inertia. The equations of dynamic equilibrium (the d'Alembert's equations).		4 hours
Reading list for the lecture: 1. Beer, F., ș.a. – Vector Mechanics for Engineers. Dynamics, 8th Ed., McGraw-Hill, New York, 2007; 2. Bejan, L. – Elemente de mecanică teoretică, Editura Performantica, Iași, 2021; 3. Hangan, S., Slătineanu, I. – Mecanică, Ed. Didactică și Pedagogică, 1983; 4. Hibbeler R. C. – Engineering Mechanics. Dynamics, Fifteenth Edition, Pearson, 2022; 5. Irnicu, N., ș.a. – Curs de mecanică, Institutul Politehnic Iași, 1992; 6. Meriam, J. L., Kraige, L. G. - Engineering Mechanics. Statics, Seventh Edition, John Wiley & Sons, 2012; 7. Vasilescu, A. – Complemente de Mecanică - curs și aplicații pentru ingineri, Ed. Conspress, București, 2000; 8. Vâlcovici, V., ș.a. – Mecanica teoretică, Ed. Tehnică, București, 1968; 9. Voinea, R., ș.a. – Mecanica, Ed. Didactică și Pedagogică, București, 1983; 10. Voinea, R., ș.a. – Introducere în mecanica solidului cu aplicații în inginerie, Ed. Academiei Republicii Socialiste România, 1989		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
9.2.1. Kinematics of the Particle; Kinematics of Particular Motions of the Rigid Body; Kinematics of Systems of Rigid Bodies. The motion of a particle with respect to orthogonal Cartesian system of coordinates. Trajectory, velocity and acceleration. The position parameters; the first- and second-order kinematic parameters for the general motion of a rigid body. The velocities and accelerations of points of rigid bodies undergoing translation, rotation about a fixed axis or general plane motion. The kinematic analysis of a one-degree-of-freedom mechanical system. The absolute and relative centers of rotation.	Academic lecture. Heuristic discussion. Inferring as a learning method.	6 hours
9.2.2. Dynamics of the Particle. Dynamics of the Absolute Motion of the Rigid Body. Kinetic parameters of the rigid body. Dynamics of particular motions of the rigid body. Solving problems of dynamics of the rigid body using the general theorems of dynamics.		4 hours
9.2.3. Dynamics of Systems of Rigid Bodies. Problems of dynamics of systems in which the d'Alembert's equations are used.		4 hours
Reading list for the seminar: 1. Bălan, Ș. – Culegere de probleme de mecanică, Ed. Tehnică, București, 1964; 2. Buchholtz, N. N., ș.a. – Culegere de probleme de mecanică rațională, Ed. Tehnică, București, 1952; 3. Hibbeler R. C. – Engineering Mechanics. Dynamics, Fifteenth Edition, Pearson, 2022; 4. Vasilescu, A. – Complemente de Mecanică - curs și aplicații pentru ingineri, Ed. Conspress, București, 2000.		

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 and fluency. Capacity for analysis and personal interpretation. Level of command of specialized terminology and communication skills. Ability to process data and solve the problems presented.	- systematic observation of students (individual assignments)	20%	60% (minimum grade 5)
		- summative assessment test (final assessment)	80% (minimum grade 5)	
10.5a Seminar	Ability to apply acquired knowledge. Capacity for analysis, personal interpretation.	- active participation in the activities; - assessment test.		40%

10.6 Passing requirements

- definition and computation of the kinematic characteristics of the motion of a particle;
- identification of the types of motion of the components of a planar mechanism;
- determination of the absolute and relative centers of rotation of the components of a single-degree-of-freedom planar mechanism; calculation of the velocities of specified points;
- calculation of the first- and second-order kinematic parameters of the components of a single-degree-of-freedom planar mechanism.

The final grade 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: Assistant Professor Corneliu Eugen ȘFARTZ, PhD

Seminar instructor: Assistant Professor Corneliu Eugen ȘFARTZ, PhD

Date of departmental approval: September 2025
Head of Department,
Assistant Professor Corneliu Eugen ȘFARTZ, 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) x 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	Department of Civil and Industrial Engineering (CCI)
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	Materiale de construcții 2 Building Materials 2						
2.1.2. Course code	CE113						
2.2 Lecture instructor	Lecturer Livia - Ingrid DIACONU, PhD						
2.3 Laboratory instructor	Lecturer Livia - Ingrid DIACONU, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	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	2	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		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										14	
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	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	CE104/ Building Materials 2
4.2 Learning outcomes prerequisites	

5. Requirements

5.1 for the lecture ¹²	Face-to-face teaching at the faculty: blackboard, projector, specific teaching materials; Online synchronous teaching (Google Meet, Microsoft Teams, Zoom – academic licenses), with necessary equipment (computer, camera, microphone, speakers/headset, Internet connection); Students must comply with the Student Rights and Obligations Code and with the regulations of the University Charter of the “Gheorghe Asachi” Technical University of Iași
5.2 for the laboratory ¹³	On-site applied activities: computers, software packages, experimental stands, etc.; Online synchronous activities with full video-conference technical requirements; Deadlines for assignments are set at the beginning of the semester by the teaching staff.

6. General objective of the course

Construction Materials 2 continues and deepens the knowledge gained from Construction Materials 1. It is a continuation of concepts used to characterize, analyze and apply construction materials studied within the course. The theoretical component focuses on terminology and essential concepts, while laboratories highlight key material properties through practical experiments. The course prepares future civil engineers from the perspective of material users, not manufacturers.

7. Learning outcomes¹⁴

Knowledge	The student / graduate: <ul style="list-style-type: none"> - identifies and explains construction materials; - identifies and defines types of structural elements; - evaluates, selects and recommends optimal use of materials in construction elements; - explains properties and application technologies for civil, industrial and agricultural construction materials; - understands laboratory methods for determining technical characteristics of construction materials.
Skills	The student / graduate: <ul style="list-style-type: none"> - applies efficient and responsible work strategies, based on professional ethics; - works effectively in teams; - acquires technical knowledge required for qualitative certification of materials used on construction sites; - interprets technical characteristics in terms of quality and durability requirements; - makes decisions regarding material use according to quality.
Responsibility and autonomy	The student / graduate: <ul style="list-style-type: none"> - selects and analyses bibliographic sources; - demonstrates autonomous learning; - respects ethics and deadlines in professional tasks, applying rigorous and responsible work principles; - integrates within a work group and uses appropriate communication techniques in multidisciplinary teams; - stays informed and continuously documents developments in the field, using adequate learning tools.

8. Teaching strategies

Teaching uses participative lectures and discussions supported by PowerPoint presentations. After each lecture, students receive a document containing all presented information. Presentations include images and sketches for better understanding. Each lecture begins with a short review of previous concepts.

Teaching also uses discovery-based learning, both through direct and indirect exploration (experiments, demonstrations, modelling), as well as applied methods such as practical activities and problem-solving.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
I. Mineral binders Manifestation of binding properties. Classification of mineral binders. Air binders (clays). Air binders (based on calcium sulfate, calcium/magnesium oxides, oxy-salts). Hydraulic binders (hydraulic lime, Portland cement, alumina cement). Pozzolanic binders. Raw materials, manufacturing, setting and hardening, technical properties, domains of use.	Interactive lecture, debates, explanations	10 hours
II. Concrete and mortars with mineral binders. Concrete: Structure. Properties of fresh concrete (workability) and hardened concrete (physical and mechanical properties). Factors which influence concrete characteristics – compositional (cement, mixing water, aggregates, admixtures, additives) and technological (manufacturing, transport, pouring, subsequent actions/processes). Special types of concrete. Lightweight concrete, hydrotechnical concrete, road concrete, temperature-resilient concrete, radiation-proof concrete. Principles of mix design. Mortars: ingredients, classification, properties and domains of use.		10 hours
III. Organic binders (hydrocarbonates) – bitumen and tars		3 hours

Composition, structure and manufacturing principles. Technical characteristics. Types and domains of use (hot/cold use). Bituminous materials: emulsions and suspensions, putty, bituminous mixes, waterproofing bitumen-based products.		
IV. Wood materials - Wood composition and structure. General properties and technical characteristics. Wood products for construction (modified/unmodified structure). Protection methods against decay and fire.	Interactive lecture, debates, explanations	2 hours
V. Plastic materials - General properties of plastic materials. Materials obtained through polymerization / polycondensation.	Interactive lecture, debates, explanations	1 hour
VI. Materials for insulation, protection, and finishing Thermal and acoustic insulations. Waterproofing materials. Protection and finishing products: adhesives, sealants, lacquers, paints.	Interactive lecture, debates, explanations	2 hours
Reading list for the lecture: 1. Groll L., Hîrhui I., s.a., Materiale pentru construcții – Bazele fizico – chimice ale studiului materialelor de construcții, I.P.I. „Gh. Asachi” Iași, 1988. 2. Mircea Rujanu, Livia-Ingrid Groll, Materiale de construcții, Ed. Gh. Asachi, ISBN-973-9178-76-7, 200 pag, Iași, 1999 3. Ioan Hîrhui, Liviu Groll, Dănuț Babor, Materiale de construcții, Ed. VESPER, ISBN 973-96589-5-4, 279 pag, Iași, 1997 4. M. Rujanu - Materiale de construcții – ED. SPIRU HARET – Iasi -2011 5. Dănuț Babor - Studiul Materialelor de Construcții – Editura Societății Academice ‘Matei Teiu Botez’ ISBN 978-973-8955-33-2 6. Course support in Microsoft PowerPoint – 2025 edition		
9.2b Laboratory	Work methods ¹⁷	Observations, allotted time
Laboratory 1 - Construction lime – Beginning of lime slaking, necessary water quantity for slaking, slaking residue, paste yield, slaking speed for unslaked lime, lime paste consistency, lime paste density.	Practical demonstration, experiments	2 hours
Laboratory 2 - Construction gypsum – Grinding fineness, mixing water for obtainment of normal consistency paste, setting, expansion during setting and hardening, diffusion coefficient, mechanical strengths.		2 hours
Laboratory 3 Portland Cement – Grinding fineness, conservation state, mixing water for obtainment of normal consistency paste, setting, volume constancy during setting and hardening.		2 hours
Laboratory 4 Portland Cement – Determination of cement strength class.		2 hours
Laboratory 5 - Establishing of concrete composition – with NE 012-1-2023.		2 hours
Laboratory 6 Fresh concrete – Workability characteristics (consistency, compactness degree, occluded air, density, segregation, content of fine aggregates, beginning of setting).		2 hours
Laboratory 7 Hardened concrete – Compressive strength (the influence of testing parameters upon the output of results). Tensile strength (tension by bending, tension by splitting).		2 hours
Laboratory 8 Hardened concrete – Durability characteristics: gelivity, permeability.		2 hours
Laboratory 9 Mortars with mineral binders – Mortars for masonry and plasters.		2 hours
Laboratory 10 Methods for evaluating compressive strength of structural concrete – Non-destructive methods for the verification of concrete characteristics.		2 hours
Laboratory 11 Construction wood. Determination of humidity, apparent density, swelling and contraction, mechanical strengths.		2 hours
Laboratory 12 Organic binders – bitumen. Penetration, softening point (Ring-Ball), ductility, Fraas breaking point, Ubbelöhde dripping point.		2 hours
Laboratory 13 Lacquers and paints. Determination of color through comparison with color catalogue, paint density, dripping time, paint drying, paint coverage, paint flexibility.		2 hours
Laboratory 14 Laboratory colloquium, checking of acquired knowledge and laboratory portfolios.		Discussions, debates
Reading list for the laboratory: 1. Mircea Rujanu, Laboratorul materialelor de construcții, ISBN 9975-63-096-0, 217 pagini, Ed. Tehnică-Info, Chișinău, 2002 2. Mircea Rujanu – Încercarea unor materiale de construcții, 134 pag., Editura ”TERRA NOSTRA”, ISBN 978-973-8432-63-5, 2007 3. Dănuț Babor -Studiul Materialelor de Construcții – Editura Societății Academice ‘Matei Teiu Botez’ ISBN 978-973-8955-33-2 4. Laboratory activity sheets in PDF format – 2025 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 or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	-	70%
		- formative assessment test (tests during the semester)	-	
		- summative assessment test (final assessment)	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 laboratory worksheets (all laboratory sessions must be completed, with only one missed session allowed to be retaken) - assessment test (laboratory colloquium)		30%
<p>10.6 Passing requirements</p> <ul style="list-style-type: none"> - Minimum grade 5 on final evaluation. - Minimum grade 5 on laboratory work (laboratory colloquium and evaluation of activity portfolio). - Minimum grade 5 as a final grade, resulting from the weighted average of the grades obtained in the previously-described evaluations. <p>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.</p>				

Date of completion: September 2025

Lecture instructor:

Lecturer Livia - Ingrid DIACONU, PhD

Laboratory instructor:

Lecturer Livia - Ingrid DIACONU, 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) x 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	Elemente de arhitectură și sistematizare Elements of Architecture and Urban Planning						
2.1.2. Course code	CE114						
2.2 Lecture instructor	Professor Irina BARAN, PhD						
2.3 Seminar instructors	Lecturer Claudiu ROMILA, PhD Lecturer Ioana-Sorina ENȚUC, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	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	4	3.2 lecture	4	3.3a seminar	4	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										9	
Additional research in the library, on specialised electronic platforms, and in the field										2	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										8	
Assessment ⁸										3	
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	Board, video projector, flip chart, specific teaching materials
5.2 for the seminar ¹³	Computer equipment, software packages

6. General objective of the course

In this course, you will acquire the fundamental concepts regarding the evolution of architectural and urban elements, as well as the basic notions related to the main functions of residential buildings, the organization and functioning of urban areas, and the new approaches in the development of the built environment.

7. Learning outcomes ¹⁴

Knowledge	<p>The student / graduate:</p> <ul style="list-style-type: none"> - identifies the specific architectural elements of a building; - assimilates the theoretical and functional concepts of a building; - defines the principles of urban area organization; - applies the principles for analysing the existing built environment to formulate appropriate solutions for integration within the urban and architectural context; - correlates architectural, structural, and technological aspects in the design and execution of constructions.
Skills	<p>The student / graduate:</p> <ul style="list-style-type: none"> - selects optimal solutions for designing an urban area, aiming to avoid inconveniences in urban living; - recognizes and valorises elements of traditional architecture and techniques as sources of inspiration for modern and sustainable construction solutions; - uses measuring tools and objects specific to the graphic representation of building plans; - graphically represents various plans of a residential building designed as a single-family house; - sizes openings for natural lighting and horizontal and vertical circulation in accordance with regulations and comfort requirements; - properly annotates the plans of the building represented graphically; - represents the site plan for the analysed building, highlighting all necessary elements; - calculates the coefficients required to meet minimum urban planning standards.
Responsibility and autonomy	<p>The student / graduate:</p> <ul style="list-style-type: none"> - respects principles, norms, and ethical values in the correct and timely execution of professional tasks, adopting a rigorous, efficient, and responsible work strategy for decision-making and problem-solving; - integrates into workgroups and applies effective interpersonal and teamwork techniques within multidisciplinary teams across different hierarchical levels; - seeks continuous information and documentation in their field of activity by appropriately using effective lifelong learning methods and techniques; - understands the principles of interdisciplinary collaboration and acquires communication and professional cooperation skills with architects and engineers from various disciplines; - develops and consolidates critical, analytical, and creative-engineering thinking, as well as self-directed learning and continuous education skills, establishing a solid foundation for further professional development.

8. Teaching strategies

The teaching activities will include participatory lectures and debates supported by PowerPoint presentations made available to students. The presentations contain images and sketches to ensure that the information is easily understood and assimilated. Each lecture will begin with a brief review of the concepts covered in the previous session. The teaching method is also based on discovery-learning models, facilitated by both direct and indirect exploration of reality (experiments, demonstrations, modelling), as well as action-based methods such as exercises, practical activities, and problem-solving.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Introduction - General notions of architectural elements	Interactive lecture, debates, explanations	1 hour
9.1.2. Elements of architectural design - Factors that influence the architectural conception, Architectural space, Architectural geometry rules, Elements of architectural space, Types of architectural spaces, Architectural composition laws, Methods used in architectural creation, Architectural expression means, Features of architectural creation, Scales of architectural composition		4 hours
9.1.3. Elements of architecture history - Architecture during Stone and Metal Age, Bronze and Iron Age, Minoan civilization, Egyptian Architecture, buildings of ancient Greece and Rome, Byzantine Architecture, Romanesque and Gothic Architecture, Renaissance in Architecture, the Baroque and Rococo styles, the 19th and 20th Architecture		6 hours
9.1.4. Introduction in urban planning - Definition, Domains, Stages and Methods of Town-Planning		1 hour

9.1.5. Fundamental concepts in urban-planning - Town, urban agglomeration, conurbation, urban tissue, urban composition, urban silhouette, urban management, town structure, urban morphology, urban infrastructure	Interactive lecture, debates, explanations	2 hours	
9.1.6. Urban composition - The main instruments of urban composition and the architectural typology		1 hour	
9.1.7. Town-planning approaches and the main urban-planning trends - Functionalism and urban ecology, the physical-spatial, urbanistic, technocratic and systemic trends		2 hours	
9.1.8. Town-planning history - Social and urban forms of religious, political, commercial, industrial towns		1 hour	
9.1.9. Romanian legislation - Laws concerning town-planning		1 hour	
9.1.10. Urban analysis and urban forms - Urban evolution, interurban and urban migration, natural and conventional form		1 hour	
9.1.11. The choice of a town placement - Terrain conditions, accessibility, climatic conditions		1 hour	
9.1.12. Urban functions and urban frame - The functions and the suitable frame for an urban area		2 hours	
9.1.13. Climate, sanitation and urban hygiene - The waste problem, noise control measures		2 hours	
9.1.14. Town zoning - The industrial, residential, green areas, internal transportation areas		1 hour	
9.1.15. The town surrounding area - External transport area		1 hour	
9.1.16. The long-term development of towns - The future of cities and town-planning		1 hour	
Reading list for the lecture: 1. C. Velicu, I Gavrițaș, Al. Veres, D. Ștefănescu - <i>Elemente de sistematizare si urbanism</i> - Ed. Experților Tehnici, Iași, 1997 2. Irina Baran – <i>Architectural and Urban-Planning Elements</i> – Ed. Societății Academice ”Matei - Teiu Botez”, 2009 3. Rolf Toman – <i>History of Architecture from classic to contemporary</i> , Parragon Books Ltd, 2008 4. Gheorghe Curinschi Vorona - <i>Istoria universală a arhitecturii</i> , vol. I, II, III, Ed. Tehnică, 1983 5. Cezar Lăzărescu – <i>Urbanismul în România</i> , Ed. Tehnică, 1973 6. Alpopi Cristina - <i>Elemente de urbanism</i> , Ed. Universitară, 2008 7. Fărtășescu Mariana – <i>Introducere în urbanism</i> – Rotaprint, 2000 8. Miles Lewis, Arhitectură. <i>Elemente de stil arhitectonic</i> , Ed.Litera, București, 2011 9. Ionuț Butu, <i>Ghidul structurilor arhitecturale</i> , www.blog.deltastudio.ro , 2024 10. Adina Marin, <i>Stiluri arhitecturale în București</i> , ACPV – București, 2021			
9.2a Seminar Architectural design of a residential building		Work methods ¹⁶	Observations, allotted time
1.The dwelling – architectural program, functions, relations between them		Discussions, debates, and presentation and analysis of academic works	2 hours
2. Circulation inside the architectural space, in horizontal and vertical directions			2 hours
3. Openings in the closing elements of buildings, Dimensioning, Natural and artificial lightening	2 hours		
4. Analysis of functions required for individual dwellings, Dimensioning, Conditions for positioning the architectural plan, Arrangement	2 hours		
5. Proposals and analysis of architectural plans of individual residential buildings	3 hours		
6. Drafting of ground floor plan, scale 1/50	6 hours		
7. Drafting of first floor plan, scale 1/50	6 hours		
8. Drafting of site plan, scale 1/200	3 hours		
9. Academic works grading	2 hours		
Reading list for the seminar: 1. Baran I., Romila C: <i>Elemente de arhitectura si sistematizare - Lucrări</i> , Ed. Societății Academice ”Matei-Teiu Botez”, Iași, 2014, ISBN 978-606-582-058-6 1. Ioan Gavrițaș, <i>Proiectarea clădirilor de locuit individuale (Arhitectură)</i> , Ed. PIM, Iași, 2009 2. Ioan Gavrițaș, <i>Clădiri de locuit S+P+IE; Proiectare de arhitectură</i> , Ed. PIM, Iași, 2004 3. Alexandru Ciornei - <i>Cum concepem construcțiile civile</i> , Ed. Junimea, Iași, 2000			

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Test/ Colloquium	Completeness and accuracy of knowledge Logical coherence, fluency, and strength of argumentation	- systematic observation of students (individual or group assignments – which must be completed during the week between		50%

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
	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	lectures, preparation of a report, case study) - formative assessment test (tests during the semester) - summative assessment test (final assessment)	100%	
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 recognize the main architectural elements and to understand the principles of urban settlements organization. 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:

Professor Irina BARAN, PhD

Seminar instructors:

Lecturer Claudiu ROMILA, PhD

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) x 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	Desen tehnic și Infografică 1 Technical Drawing and Infographics 1						
2.1.2. Course code	CE115						
2.2 Lecture instructor	Lecturer Ion ANTONESCU, PhD						
2.3 Seminar instructor	Lecturer Ion ANTONESCU, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	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	1	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	42	3.5 lecture	14	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										3	
Additional research in the library, on specialised electronic platforms, and in the field										3	
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	
5.2 for the seminar / laboratory / project ¹³	

6. General objective of the course

In this course, you will learn the theoretical and practical foundations of technical graphic representations, a universal language of communication within any civil engineering process. The theoretical knowledge acquired will allow you to understand the geometry of projection systems, which generate the two-dimensional representation of

objects in three-dimensional space, as well as knowledge of international standards for technical graphic representations in civil engineering. You will acquire practical skills in correctly reading technical graphic representations and creating relief sketches and scale drawings, as a basis for civil engineering design. This knowledge and these skills will serve as a basis for creating civil engineering graphic representations with the help of a computer in subsequent modules.

7. Learning outcomes¹⁴

Knowledge	The student /graduate: <ul style="list-style-type: none"> - identifies and describes basic concepts, principles and methods in mathematics, physics, chemistry, technical drawing, economics and computer science; - identifies, evaluates, and explains the constructive composition of different categories of buildings and their locations, for the purpose of preparing and using specific technical documentation.
Skills	The student /graduate: <ul style="list-style-type: none"> - operates with basic concepts, principles and methods from mathematics, physics, chemistry, technical drawing, economics and computer science; - performs engineering and economic calculations of medium complexity and associates them with graphical representations specific to computer-aided design; - graphically represents elements and types of constructions, in order to create the drawn parts of technical projects; - sizes and checks construction elements, in order to produce written pieces within technical projects.
Responsibility and autonomy	The student /graduate: <ul style="list-style-type: none"> - 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 graphic representations made on blackboard that will be made simultaneously by students. The materials presented will also be made available to students on the university's e-learning platform. 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.

9. Content

9. 1. Lecture¹⁵	Teaching strategies	Time allocation
9.1.1. Views layout. Sloped views.	Interactive lecture, debates, explanations	1 hour
9.1.2. Dimensioning.		1 hour
9.1.3. Level marks. Slopes.		1 hour
9.1.4. Detail drawing. Building tracing axis. Representation of holes in walls and plates.		1 hour
9.1.5. Drawing of reinforced concrete beams.		1 hour
9.1.6. Representation of stairs and staircases.		1 hour
9.1.7. Drawing of timber structures.		1 hour
Reading list for the lecture: 1. Antonescu I. - Technical Drawing and Infographics 1, on Google Classroom, https://classroom.google.com/u/1/c/NzU4MzE2OTQxMzg0 2. Slonovschi A., Prună L., Antonescu I. - Desen tehnic pentru construcții, Editura PIM, Iași, 2010; 3. Hâncu G., Antonescu I. - Guidebook of Technical Drawing in Construction, Ed.Soc. Acad. „Matei-Teiu Botez”, Iași, 2008		

4. Stănilă, A., Desen tehnic, Iași, Ed. Cerami, 1998;		
5. Hîncu, G., Stănilă, A., Desen tehnic in construcții, Iasi, Casa de editura Venus, 1998;		
6. Popa, C., ș.a., Desen tehnic, Iași, Ed. "Gh. Asachi", 1996.		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
9.2a.1. Tools and materials needed. Line types.	Discussions, debates, presentation and/or analysis of works, exercises and problem solving	1 hour
9.2a.2. Formats. Graphical elements of the format. Drawing title block.		1 hour
9.2a.3. Applications to views layout - sketch of a simple Lego construction.		1 hour
9.2a.4. Control test 1 – Drawing of the six projections of a simple Lego construction.		1 hour
9.2a.5. Sketch and survey drawing. Drawing scales.		1 hour
9.2a.6. Sketch of a plan section and a vertical section through a construction.		1 hour
9.2a.7. Control test 2 – Scale drawing of a current floor plan section.		1 hour
9.2a.8. Applications at geometrical constructions.		1 hour
9.2a.9. Drawing of a simple reinforced concrete beam.		1 hour
9.2a.10. Drawing of a wood ridge node. Drawing of a simple metal truss.		1 hour
9.2a.11. Drawing of a simple foundation plan.		1 hour
9.2a.12. Sketch of a plan and a vertical section through the staircase of a building.		1 hour
9.2a.13. Control test 3 – Scale drawing of a plan and a vertical section through the staircase of a building.		1 hour
9.2a.14. Correcting of works. Recoveries. Grading.		1 hour
Reading list for the seminar:		
1. Antonescu I. - Technical Drawing and Infographics 1, on Google Clasroom, https://classroom.google.com/u/1/c/NzU4MzE2OTQxMzg0		
2. Slonovschi A., Prună L., Antonescu I. - Desen tehnic pentru construcții, Editura PIM, Iași, 2010;		
3. Hîncu G., Antonescu I. - Guidebook of Technical Drawing in Construction, Ed.Soc. Acad. „Matei-Teiu Botez”, Iași, 2008		
4. Stănilă, A., Desen tehnic, Iași, Ed. Cerami, 1998;		
5. Hîncu, G., Stănilă, A., Desen tehnic in construcții, Iasi,Casa de editura Venus,1998;		
6. Popa, C., ș.a., Desen tehnic, Iași, Ed. "Gh. Asachi", 1996		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final 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	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	-	60 %
		- formative assessment test (tests during the semester)	60 %	
		- summative assessment test (final assessment)	40 %	
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities - assessment test		40 %
10.6 Passing requirement				
- Graphic representation of the elements of an existing construction through survey.				
- Identification and use of technical regulations specific to graphic representations of civil constructions.				
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 Ion ANTONESCU, PhD

Seminar instructor:

Lecturer Ion ANTONESCU, PhD

Date of departmental approval:
September 2025

Lecturer Liviu PRUNĂ, 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) x 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	Rezistența materialelor 1 Strength of Materials 1						
2.1.2. Course code	CE116						
2.2 Lecture instructor	Lecturer Georgiana BUNEA, PhD						
2.3 Seminar instructors	Lecturer Georgiana BUNEA, PhD, Associate Professor Ionuț - Ovidiu TOMA, PhD, Lecturer Sergiu - Mihai ALEXA - STRATULAT, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	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	5	3.2 lecture	3	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	70	3.5 lecture	42	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										15	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										20	
Assessment ⁸										4	
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 (if applicable)

4.1 Curriculum prerequisites ¹¹	
4.2 Learning outcomes prerequisites	<ul style="list-style-type: none"> - identifying section types (with or without symmetry axis); - identifying the supports and the number of reactions that they generate; - reaction forces computation; - computing areas and moments of inertia for cross-sections having simple geometrical shapes

5. Requirements

5.1 for the lecture ¹²	Blackboard, specific teaching materials Students shall comply with the Student Rights and Obligations Code and the regulations set forth in the Charter of the ‘Gheorghe Asachi’ Technical University of Iași
5.2 for the seminar ¹³	Blackboard, specific teaching materials Experimental stand Deadlines for submitting assignments and homework are set by the course instructor and are announced when the tasks are assigned.

6. General objective of the course

Within this course, students acquire the theoretical knowledge needed to identify structural elements and the loads to which they are subjected, as well as to develop practical calculation skills for their verification and sizing, under optimal conditions of execution and operation.

7. Learning outcomes ¹⁴

Knowledge	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - Explains the distribution of stresses over the cross-section and the distribution of internal forces in linear elements - Compares the types of simple loadings associated with linear elements (first-order analysis in the linear elastic domain) - Evaluates internal forces in linear elements and the plane stress and strain state at a point - Defines the calculation assumptions, internal forces, stresses, strains, and displacements - Describes the plane stress/strain state and the internal forces corresponding to each simple loading case (first-order analysis in the linear elastic domain)
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - Draws internal force diagrams for statically determinate linear elements subjected to simple loading conditions - Applies strength and stiffness criteria for the verification, sizing, and load-bearing capacity calculation of linear elements (first-order analysis in the linear elastic domain) - Properly identifies simple loading states
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - Respects ethical principles, norms, and values in the correct and timely completion of professional tasks, by adopting a rigorous, efficient, and responsible work strategy and by making informed decisions for problem solving; - Consults and analyses bibliographic sources in Romanian and in an internationally spoken language for professional and personal development, through continuous learning and effective adaptation to new technical requirements.

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. Introduction. Classification and Idealized Representation of Structural Elements - Strength of Materials Objectives. Classification of Structural Elements. Idealized Representation of Structural Elements. Reference Systems. Supports.	Interactive lecture, debates, explanations	2 hours
9.1.2. Loads. Equilibrium of Structural Elements - Classification of Loads. Equilibrium Equations Expressed in Vector and Scalar Forms.		2 hours
9.1.3. Internal Forces and Moments - Internal Resistant Wrench. Diagrams of Internal Forces and Moments. Differential Relations between Loads and Internal Forces and Moments. States of Loading.		4 hours
9.1.4. Stresses. Strains. Displacements - Total Stress. Normal Stress. Shear Stress. Stress Tensor. Equivalence Relations. Axial Strains. Shear Strains. Strain Tensor. Displacements.		3 hours
9.1.5. Strength of Materials Background - Hypotheses. Characteristic Diagram of the Specimen. Characteristic Diagram of the Material. Mechanical Properties of Materials. Hooke's Law. Work and Strain Energy. Design Methods in Strength of Materials		4 hours
9.1.6. Plane Stress. Plane Strain - Stresses on Inclined Planes. Principal Stresses. Extreme Shear Stresses. Mohr's Circle for Plane Stress. Isostatics. Strains along		4 hours

Different Directions. Principal Strains. Mohr's Circle for Plane Strain. Hooke's Law for Plane Stress and Strain.		
9.1.7. Concentric Tension or Compression - General Considerations. Normal Stresses Formula. Strains and Displacements. Stress Concentration. Own Weight Effect. Member of Constant Strength. Stepped and Tapered Members. Statically Indeterminate Structural Elements and Systems. Strain Energy. Design Aspects.	Interactive lecture, debates, explanations	6 hours
9.1.8. Pure Shear. Joints - General Considerations. Shear Stress Formula. Strains and Displacements. Strain Energy. Design of Joints (by using rivets, bolts, welding).		4 hours
9.1.9. Free Torsion - General Considerations. Shear Stress Formula (for Circular Sections, Rectangular Sections, Thin – Walled Open Sections, Thin – Walled Closed Sections). Strains. Displacements. Strain Energy. Design Aspects.		4 hours
9.1.10. Bending - General Considerations. Normal Stress Formula (Navier's Formula). Extreme Normal Stresses. Beam of Constant Strength. Arm of the Internal Resisting Couple. Strains. Strain Energy. Design Aspects.		5 hours
9.1.11. Combined Bending and Shear - General Considerations. Shear Stress Formula (Juravski's Formula). Plane Stress at a Point of a Beam Subjected to Combined Bending and Shear. Isostatics. Longitudinal Shear Force. Shear Center. Strain Energy. Design Aspects.		4 hours
Reading list for the lecture: 1. Clyne, T. W., & Campbell, J. E. (2021). <i>Testing of the Plastic Deformation of Metals</i> . Cambridge: Cambridge University Press. 2. Murărașu V., Toma I. O., (2013), <i>Strength of Materials – Fundamentals</i> , Ed. StudIS, Iași, ISBN: 978-606-624-553-1. 3. Ibănescu M., Toma I.O., (2013), <i>Strength of Materials – Advanced</i> , Ed. Societății Academice „Matei Teiu Botez”, 978-606-972-046-3 4. Timoshenko S.P., (2010), <i>History of Strength of Materials</i> , Dover Publications Inc., ISBN: 0-486-61187-6. 5. Murărașu V., (2010), <i>Rezistența materialelor</i> , vol. 1, Ed. Societății Academice „Matei-Teiu Botez”, Iași, ISBN: 978-973-8955-90-5.		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
9.2.1. Geometrical Properties of Plane Areas - Centroid location. First moment of area. Product of inertia. Moment of inertia. Principal axes. Principal moments of inertia. Gyration radius. Modulus of section.	Problem solving, discussion, explanations	2 hours
9.2.2. Diagrams of Internal Forces and Moments for Straight Members - Reactive Forces. Internal Forces and Moments Functions. Graphical Representations of these Functions (Diagrams).		6 hours
9.2.3. Experimental Analysis of Displacements, Strains and Stresses - Theoretical Background and Laboratory Tests		1 hours
9.2.4. Tensile Test for Low Carbon Steel - Characteristic Diagram of the Material. Strength Values. Elastic Constants of the Material (E, ν)		1 hours
9.2.5. Plane Stress - Stresses on Inclined Planes. Principal Stresses. Extreme Shear Stresses. Mohr's Circle. Strains.		2 hours
9.2.6. Concentric Tension or Compression - Design of Statically Determinate and Indeterminate Structural Elements Subjected to Different Loads According to Strength and Stiffness Requirements		4 hours
9.2.7. Pure Shear - Design of Welded and Riveted Joints.		3 hours
9.2.8. Free Torsion - Design of Structural Elements with Different Cross-Sectional Shapes According to Strength and Stiffness Requirements		3 hours
9.2.9. Pure Bending - Experimental Analysis of Stresses at a Point of a Beam		3 hours
9.2.10. Combined Bending and Shear - Design of Beams with Different Cross-Sectional Shapes. Distribution of Normal and Shear Stresses on Different Cross-Sections.		3 hours
Reading list for the seminar: 1. Vrabie M., Ibănescu M., Toma I.O., Băetu S.A., Chițan V.E. (2018), <i>Rezistența materialelor. Culegere de probleme.</i> - Ediție bilingvă româno-engleză, Ed. Societății Academice “Matei-Teiu Botez”, Iași, ISBN 978-606-582-135-4 2. Precupanu D., (2006), <i>Fundamente de rezistența construcțiilor – sinteze teoretice și aplicații ingineresti</i> , Ed. Politehnia, Iași. 3. Precupanu D., Ibănescu M., (2006), <i>Strength of materials – theoretical synthesis and engineering applications</i> , Ed. Ștef, Iași. 4. Ciomocoș F.D., Nicoară Ș.V., Constantin A.T., (2004-2005), <i>Rezistența materialelor – aplicații</i> , vol. 1-2, Univ. Politehnica Timișoara. 5. Missir Vlad I., (2004), <i>Strength of materials – selected problems</i> , Tehnopress Iași.		

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	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures,	10%	80%

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
	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	preparation of a report, case study)		
		- formative assessment test (tests during the semester)		
		- summative assessment test (final assessment)	90% (min. 5)	
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities - assessment test		20%
10.6 Passing requirements - To recognize simple loading states; - To calculate principal stresses and principal strains; - To be able to design the cross-sections of linear elements subjected to simple loading states using strength and stiffness criteria; - To be able to evaluate the load-bearing capacity of linear elements subjected to simple loading states using strength and stiffness criteria.				
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 Georgiana BUNEA, PhD

Seminar instructors:

Lecturer Georgiana BUNEA, PhD

Assistant Professor Ionuț - Ovidiu TOMA, PhD

Lecturer Sergiu-Mihai ALEXA-STRATULAT, PhD

Date of departmental approval:

September 2025

Head of Department,
Lecturer Mircea - Vasile VENGGHIAC, 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) x 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	Educație fizică 2 Physical Training 2						
2.1.2. Course code	CE117						
2.2 Lecture instructor							
2.3 Seminar instructor	Lecturer Ady-Constantin RANCEA, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Assessment method ⁴	Vp	2.7 Course type ⁵	DI

3. Estimated total time (hours per semester)

3.1 Number of hours per week	1	3.2 lecture		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	14	3.5 lecture		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										8	
Additional research in the library, on specialised electronic platforms, and in the field										3	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios											
Assessment ⁸										2	
Other activities:											
3.7 Total number of individual study hours ⁹	11										
3.8 Total number of hours per semester ¹⁰	25										
3.9 Number of ECTS credits	1										

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	Synthetic football field, tennis courts, gyms Fitness rooms, specific materials, etc. Students must comply with the Student Rights and Obligations Code and with the regulations of the University Charter of the “Gheorghe Asachi” Technical University of Iași.

6. General objective of the course

The main objective of the **Physical Training 2** course is to increase the students' physical and intellectual capacity, to stimulate the independent practice of physical exercise and to improve basic motor skills. The aim is to strengthen the health and harmonious development of the young people's body, to acquire and consolidate some basic elements and procedures in athletics, gymnastics, sports games, fitness, their application in bilateral games or individual activities; to learn some basic notions related to the regulations for holding various sports competitions.

7. Learning outcomes ¹⁴

Knowledge	The student/ graduate: <ul style="list-style-type: none"> - understands basic concepts regarding the rules and techniques of sports games and gymnastic exercises; - knows the structure and purpose of the main physical exercises and sports practiced within physical education disciplines; - understands the role of physical activity in the physical and mental balance necessary for a demanding engineering career;
Skills	The student/ graduate: <ul style="list-style-type: none"> - Is able to correctly apply technical and tactical elements from athletics, gymnastics, sports games, or fitness; - Actively participate in exercises and applicative games to develop basic motor skills; - Demonstrates physical skills and coordination in the execution of individual or group exercises; - Adapts physical effort to one's own abilities and contributes to team sports activities
Responsibility and autonomy	The student/ graduate: <ul style="list-style-type: none"> - Demonstrates responsibility in complying with regulations, safety standards, and teacher instructions; - Demonstrates autonomy in practicing physical exercise outside of class; - Assumes correct and collaborative behaviour in collective sports activities; - Raises awareness of the importance of physical education in long-term personal and professional development.

8. Teaching strategies

The teaching activity is performed through demonstrations and exercises.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
Reading list for the lecture:		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
1. Sports games: basketball, handball, football, volleyball, badminton: <ul style="list-style-type: none"> - fundamental positions, positioning, and movement on the field; - simple kicks, services, exercises for receiving, catching, and passing the ball from a standing position and from running; exercises for completing basic technical and technical-tactical actions, marking, and marking exercises; - overall participation in games on small and normal fields with effective differences 	Physical activities Exercises and applicative games	7 hours
2. Improving basic motor skills and those specific to certain sports, through the use of bodybuilding, athletics, and fitness equipment: <ul style="list-style-type: none"> - increasing strength and muscle mass through the appropriate and individualized use of weights, dumbbells, and barbells; exercises to adjust the forms and transform fat into active mass; improving the forms of speed manifestation (reaction, repetition, movement, execution through specific exercises); - improving general coordination indices and specific skill in different specific branches; - increasing mobility and suppleness at the level of different segments Increasing running endurance 		7 hours
Reading list for the seminar: 1. Brata Maria,1996, Metodica educației fizice și sportului, vol. I, Universitatea Oradea. 2. Cârstea Gh.,1993, Teoria și Metodica Educației fizice și sportului , Editura Universul, București. 3. Dragnea A. și col.,2006, Educație fizică și sport – teorie si didactica, Editura FEST, București. 4. Dragnea, A., Bota, A., 1999, Teoria activităților motrice, Editura Didactica și Pedagogica, R.A., București. 5. Gaiță D.,Merghes P.; 2002, Primul pas – Principii practice ale antrenamentului fizic în bolile cardiovasculare; Ed Mirton, Timisoara. 6. Hañțiu I., 2011, Teoria educației fizice și sportului, Editura Universității din Oradea, Oradea. 7. Ionescu, A., Mazilu ,V. 1971, Exercițiul fizic în slujba sănătății, Editura Stadion, Bucuresti. 8. Ionescu I.V.1995, Fotbal, Ed. Helicon, Bucuresti. 9. Maroti, Ș., 2008 Baschet, volumul I, Editura Universității din Oradea, Oradea. 10. Maroti ,Ș., 2009 Baschet. Volumul II, Editura Universității din Oradea, Oradea. 11. Merghes P,Țeghiu A., 2006; Gimnastica medicală pentru prevenirea și corectarea deficiențelor fizice; Ed Mirton, Timisoara. 12. Morun P.;1996, Curs practic de educație fizică și sport. Lito.		

13. Preda O.;1995, Volei la studenți; Ed.Mirton, Timisoara.
 14. Siclovan I.,1979, Teoria educației fizice și sportului, Editura Sport - Turism, București.
 15. Teghiiu A., Merghes P, 2009, Deficiențele Fizice-ghid practic” Ed. Eurostampa Timisoara.
 16. Teodorescu, Leon, 1973, Terminologia educației fizice și sportului, Editura Stadion, Bucuresti.
 17. Ulmeanu, Constantin ,1966, Noțiuni de fiziologie cu aplicații la exercițiile fizice, Editura UCFS, Bucuresti

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method	10.3 Percentage of final grade
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities	100%
10.6 Passing requirements The student passes the course on Physical Training I if he demonstrates fundamental practical skills in athletics, gymnastics, sports games, and bodybuilding/ fitness, respectively the ability to correctly and efficiently execute specific techniques, to actively participate in sports activities and to improve his basic and specific motor qualities through individualized training.			
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 instructors:

Lecturer Ady-Constantin RANCEA, PhD

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.

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) x 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	Practica tehnologică Technological Practice						
2.1.2. Course code	CE118						
2.2 Lecture instructor	-						
2.3 Practical session instructors	Lecturer Claudiu ROMILA, PhD Lecturer Ruxandra COZMANCIUC, PhD Lecturer Iuliana HUDIȘTEANU, PhD						
2.4 Year of study ²	1	2.5 Semester ³	2	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		3.3.d practical sessions	
3.4 Total number of hours in the curriculum ⁶	60	3.5 lecture		3.6a seminar		3.6b laboratory		3.6c project		3.6.d	60
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										10	
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				40							
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	

5. Requirements

5.1 for the lecture ¹²	
5.2 for the seminar / laboratory / project ¹³	On-site field trip; Research and study activity; Activity of analysis and processing of information regarding execution technology; The deadlines for to submit the papers are set by the teacher in agreement with the students.

6. General objective of the course

*In the **Technological Practice** discipline, students will identify construction materials, construction categories, structural systems, structural and non-structural elements of a construction, in different stages of construction works execution. The development of the multi-criteria spirit of approach to the knowledge acquired in the construction site, compared to those acquired in specialized disciplines, will be pursued. Students will also familiarize themselves with*

the labour protection rules for the construction activity. It will be highlighted the importance of the construction site safety or any protective equipment, along with potential construction site hazards.

7. Learning outcomes¹⁴

Knowledge	The student: <ul style="list-style-type: none"> - identifies construction materials and products, as well as construction elements; - describes technological processes for obtaining construction materials and products; - identifies tools and equipment used for the safety construction works; - mentions the legislation regarding labour protection rules in construction works
Skills	The student: <ul style="list-style-type: none"> - analyses the tools and equipment needed for the various stages of execution of construction works; - analyses the technical sheets of construction materials and products; - critically evaluates equipment, processes and construction products by identifying the optimal solution.
Responsibility and autonomy	The student: <ul style="list-style-type: none"> - 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 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 and analysis of real cases to stimulate critical thinking and the ability to apply knowledge in authentic contexts.

9. Content

9.2d Practical Session	Teaching strategies Work methods	Observations, allotted time
Work safety rules		6 hours
Presentation of faculty laboratories and equipment The laboratories and test machines are presented, the main research activities and experimental programs are presented, the seismic platform, the wind tunnel, the road station are presented.	Interactive lecture, debates, explanations	6 hours
The documentation activity implies gathering information from the considered work points: a) Systematization and organization of the terrain on which a building is placed on: a sketch of the situation plan, containing the building area and its connections with the rest of the site, is to be drawn in the practice notebook; b) Functional characteristics of the building: using sketches from the technical documentation, the plans regarding the building functionality are reproduced in the practice notebook, adding necessary explanations; c) Structural characteristics of the building, presented by plans, cross-sections and execution details for the main construction elements, are sketched in the practice notebook; d) Execution technology of the building: briefly presented in a descriptive part, with explanatory sketches and/or pictures taken at the construction site; e) Organization of works is presented in the practice notebook using a marked plan in which the following aspects are pointed out: equipment location, material and precast elements deposits, security and firefighting organization, ways of access, energy supply networks, transportation distances for concrete and precast members;	On-site field trip Explanation, case studies	24 hours

f) Organization of the work executing unit is described in the practice notebook, underlining: the names and subordination links, the internal organization with the tasks of various departments, work formations etc.		
Analysis, synthesis and processing of information regarding materials and execution technologies, presented both theoretically and practically on site: a) Drawing the building realization graph or reconstructing it, under the guidance of the work point leader, in the practice notebook, in order to point out: main technological steps, their sequence and connections; scheduled time for each execution step, and for the whole building assembly, and their implementation until the completion of the practice internship; b) Drawing flowcharts in the practice notebook, with the organization of the main complex technological processes; c) Comparing the site reality with the theoretical information received on building materials.		24 hours
Reading list for the practical session: - Ghid de practică, Caiet de practică, 2025, edu.tuiasi.ro, ci.tuiasi.ro - Legea 10 – 1995 (2016), cu completările și modificările ulterioare, privind calitatea în construcții - Legea 319/2006, Legea de bază privind securitatea și sănătatea în muncă		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method	10.3 Percentage of final grade
10.5.d Colloquium	Participation to practical activities, ability to conduct research/ documentation, and application of knowledge in practical work; Ability to apply acquired skills; Ability to process data and solve the problems presented	- practical work, systematic observation of students during the practical session - portfolio completion - portfolio/fieldwork notebook viva	100%
10.6 Passing requirements The student must participate in at least 80% of the practical activities. The student must present the objectives visited and the safety equipment used on the construction site			
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 instructors:

Lecturer Claudiu ROMILA, PhD

Lecturer Ruxandra COZMANCIUC, PhD

Lecturer Iuliana HUDIȘTEANU, 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) x 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	Opțional 1 - Limba engleză 1 Optional 1 - English Language 1						
2.1.2. Course code	CE119						
2.2 Lecture instructor	-						
2.3 Seminar instructor	Lecturer Lucia-Alexandra TUDOR, Dr.						
2.4 Year of study ²	1	2.5 Semester ³	1	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	1	3.2 lecture		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	14	3.5 lecture		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										12	
Additional research in the library, on specialised electronic platforms, and in the field										12	
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	36										
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/whiteboard, video projector
5.2 for the seminar ¹³	Blackboard/whiteboard, video projector, dictionaries

6. General objective of the course

Acquisition of communication skills according to the Common European Framework of Reference for Foreign Languages, development of written and oral communication skills in English in a technical university, development of written and oral message reception skills in English, both in social, professional, and technical contexts. The aim is to consolidate linguistic skills through the appropriate use of specialized vocabulary, correct grammatical structures and

discursive strategies necessary for the efficient transmission of information for active collaboration with native and non-native speakers.

7. Learning outcomes¹⁴

Knowledge	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - understands and explains fundamental concepts and grammatical structures of the English language, adapted to the level of study; - distinguishes and applies general and specialized vocabulary, relevant to the technical and scientific field; - identifies sources of linguistic information and lexical resources (dictionaries, databases, online corpora) and integrates them into the learning process; - understands the mechanisms of receiving oral and written messages in English and the particularities of academic communication.
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - uses specific tools (printed and online dictionaries, specialized glossaries, linguistic databases) to verify and acquire general and specialized vocabulary; - develops stylistically and grammatically appropriate texts, corresponding to the academic and professional context; - operates with specialized vocabulary and linguistic structures in writing and interpreting texts in English; - uses English correctly in oral and written communication, adapted to various situations (academic, professional, intercultural); - actively participates in discussions, debates, and group projects, demonstrating collaboration capabilities in intercultural contexts; - makes clear and structured oral presentations on general and specialized topics; - interprets and synthesizes information from texts and audio-video materials in English.
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - 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; - demonstrates autonomy and critical thinking in receiving and interpreting messages in English.

8. Teaching strategies

Specific materials for grammar, vocabulary and specialized language in English will be used in the teaching activity, as well as Power Point presentations. The presentations contain images and syntheses, so that the information is easy to understand and assimilate. The teaching method is also based on communicative learning models through discovery, facilitated by direct and indirect exploration of reality, but also on action-based methods, such as exercise and practical written and oral activities.

9. Content

9.2a Seminar	Work methods ¹⁶	Observations, allotted time
9.2a.1. Aspects of English phonetics and spelling; common mistakes. Exercises; conversation on a given topic.	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.2. Grammar aspects: The verb (I) Classification. Tenses, moods (The indicative: present simple, present progressive). Personal pronouns. Oral and written grammar and vocabulary exercises.		2 hours
9.2a.3. Demonstrative pronouns and adjectives. The verb (II) Particularities of the verb to be. Extending an invitation, accepting/refusing an invitation. Oral and written applications		2 hours
9.2a.4. The noun (gender, number, genitive case). The adjective (I) Use and word order. Descriptions. Oral and written exercises.		2 hours
9.2a.5. The verb (III) Tenses referring to the past. Applications.		2 hours

9.2a.6. Vocabulary practice: General aspects of situational lexis.	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.7. Interrogative sentences. Requesting information. Writing a letter /an email. Applications.		2 hours
Reading list for the seminar: 1. Allsop, Jake, <i>Test Your Verbs</i> , Harlow, Pearson, 2002 [și alte ediții] 2. Coe, Norman, Mark Harrison, Ken Patterson, <i>Oxford Practice Grammar</i> , Oxford, Oxford University Press, 2006 3. Frenzo, Evan, <i>English for Construction 1</i> , Harlow, Pearson, 2017 4. Hanson, Adrian, Jenny Dooley, <i>Civil Engineering</i> , Express Publishing, 2019 5. Literat, Ruxanda (ed.), <i>Teste de competență lingvistică</i> , Cluj-Napoca, U. T. Press, 2024 6. McCarthy, Michael, Felicity O'Dell, <i>English Collocations in Use - Intermediate</i> , Cambridge University Press, 2017 7. Tudor, Lucia-Alexandra, <i>English for Civil Engineering</i> , Iași, Tehnopress, 2014		

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			50%
		- summative assessment test (final assessment)	100%	
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 topics of general interest, as well as on basic technical topics in the field of civil engineering. The student is able to write texts (e-mails, reports, process 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, even if some hesitations or mistakes occur.				
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.

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/Standarda-specifica-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	Opțional 2 - Limba engleză 2 Optional 2 - English Language 2						
2.1.2. Course code	CE120						
2.2 Lecture instructor:	-						
2.3 Seminar instructor:	Lecturer Lucia-Alexandra TUDOR, Dr.						
2.4 Year of study ²	1	2.5 Semester ³	2	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	1	3.2 lecture		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	14	3.5 lecture		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										12
Additional research in the library, on specialised electronic platforms, and in the field										12
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	36									
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

Acquisition of communication skills according to the Common European Framework of Reference for Foreign Languages, development of written and oral communication skills in English in a technical university, development of written and oral message reception skills in English, both in social, professional and technical contexts. The aim is to consolidate linguistic skills through the appropriate use of specialized vocabulary, correct grammatical structures and

discursive strategies necessary for the efficient transmission of information for active collaboration with native and non-native speakers.

7. Learning outcomes¹⁴

Knowledge	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - understands and explains fundamental concepts and grammatical structures of the English language, adapted to the level of study; - distinguishes and applies general and specialized vocabulary, relevant to the technical and scientific field; - identifies sources of linguistic information and lexical resources (dictionaries, databases, online corpora) and integrates them into the learning process; - understands the mechanisms of receiving oral and written messages in English and the particularities of academic communication.
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - uses specific tools (printed and online dictionaries, specialized glossaries, linguistic databases) to verify and acquire general and specialized vocabulary; - develops stylistically and grammatically appropriate texts, corresponding to the academic and professional context; - operates with specialized vocabulary and linguistic structures in writing and interpreting texts in English; - uses English correctly in oral and written communication, adapted to various situations (academic, professional, intercultural); - actively participates in discussions, debates, and group projects, demonstrating collaboration capabilities in intercultural contexts; - makes clear and structured oral presentations on general and specialized topics; - interprets and synthesizes information from texts and audio-video materials in English.
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - 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; - demonstrates autonomy and critical thinking in receiving and interpreting messages in English.

8. Teaching strategies

Specific materials for grammar, vocabulary and specialized language in English will be used in the teaching activity, as well as Power Point presentations. The presentations contain images and syntheses, so that the information is easy to understand and assimilate. The teaching method is also based on communicative learning models through discovery, facilitated by direct and indirect exploration of reality, but also on action-based methods, such as exercise and practical written and oral activities.

9. Content

9.2a Seminar	Work methods ¹⁶	Observations, allotted time
9.2a.1. Cardinal and ordinal numerals. Telling time. Recounting an event. Oral and written applications.	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.2. The verb (IV) Future tenses. Planning future events. Oral and written applications.		2 hours
9.2a.3. Possessive pronouns and adjectives. The relative pronoun. Writing an Europass CV.		2 hours
9.2a.4. Prepositions. Collocations. Writing an argumentative essay. Oral and written applications.		2 hours
9.2a.5. The verb (V) Passive voice. The language of science. Describing an experiment. Exercises.	Presentation and discussion of the topics, solving	2 hours

	exercises and tasks, conversation, debates	
9.2a.6. The adjective (II) Comparatives and superlatives. The adverb. Oral and written exercises.	Presentation and discussion of the topics, solving exercises and tasks, conversation, debates	2 hours
9.2a.7. Communication skills. Linguistic registers. Applications.		2 hours
Reading list for the seminar: 1. Allsop, Jake, <i>Test Your Verbs</i> , Harlow, Pearson, 2002 [și alte ediții] 2. Coe, Norman, Mark Harrison, Ken Patterson, <i>Oxford Practice Grammar</i> , Oxford, Oxford University Press, 2006 3. Frenco, Evan, <i>English for Construction 1</i> , Harlow, Pearson, 2017 4. Hanson, Adrian, Jenny Dooley, <i>Civil Engineering</i> , Express Publishing, 2019 5. Literat, Ruxanda (ed.), <i>Teste de competență lingvistică</i> , Cluj-Napoca, U. T. Press, 2024 6. McCarthy, Michael, Felicity O'Dell, <i>English Collocations in Use - Intermediate</i> , Cambridge University Press, 2017 7. Tudor, Lucia-Alexandra, <i>English for Civil Engineering</i> , Iași, Tehnopress, 2014		

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			50%
		- summative assessment test (final assessment)	100%	
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 topics of general interest, as well as on basic technical topics in the field of civil engineering. The student is able to write texts (e-mails, reports, process 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, even if some hesitations or mistakes occur.				
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.

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	Department of Civil and Industrial Engineering (CCI)
1.4 Field of study	Civil Engineering
1.5 Level of study ¹	Bachelor's degree
1.6. Study programme	ICE – Civil Engineering in English Language

2. Course information

2.1.1 Course title	Estetică Aesthetics						
2.1.2. Course code	CE121						
2.2 Lecture instructor	Lecturer Claudia - Ioana CIOBANU, PhD						
2.3 Seminar/laboratory/project/practical session instructor(s)							
2.4 Year of study ²	1	2.5 Semester ³	1	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	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										10	
Additional research in the library, on specialised electronic platforms, and in the field										12	
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios											
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	- Blackboard, video projector, and possibly other specific teaching materials, etc. - Students shall comply with the Code of Students’ Rights and Obligations and the Regulations provided by “Gheorghe Asachi” Technical University of Iași.
5.2 for the seminar / laboratory / project ¹³	

6. General objective of the course

In this course, students will learn how to develop creativity and practical skills, understand the aesthetic requirements necessary for designing advertising materials, and acquire the fundamental elements specific to graphic design.

7. Learning outcomes¹⁴

Knowledge	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - explains fundamental concepts of aesthetics and visual identity; - defines and applies core principles of graphic design; - describes branding strategies specific to the engineering services market; - explains the role of image and visual communication in the real estate and engineering sectors; - analyzes the role of colour in visual communication, particularly within the real estate field; - identifies the fundamental elements and tools used in graphic design; - explains the role of graphics and the non-verbal component in marketing communication; - describes computerized image processing techniques; - explains creative strategies used in promoting engineering services.
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - applies aesthetic principles in the design of advertising materials and engineering service projects; - develops coherent visual identity concepts adapted to the engineering services market; - critically analyzes and evaluates visual communication materials; - uses digital tools for graphic design and computerized image processing; - synthesizes ideas into creative design projects (advertising and/or environmental design); - applies demonstrated solutions in practical design tasks; - integrates branding and marketing strategies into visual communication projects.
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - demonstrates creativity, critical thinking, and practical judgment in developing design projects; - adapts design solutions to the requirements of the Romanian economic and engineering environment; - works independently and collaboratively in multidisciplinary teams; - complies with ethical and professional standards in visual communication and advertising; - engages in continuous self-improvement in the fields of aesthetics, design, and visual communication.

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.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. Aesthetics and visual identity - introductory notions; operational concepts.	Interactive lecture, debates, explanations	3 hours
9.1.2. Principles of graphic design.		3 hours
9.1.3. Branding in the engineering services market.		3 hours
9.1.4. The image in visual communication for the real estate sector		3 hours
9.1.5. The role of color in visual communication for the real estate sector.		3 hours
9.1.6. Fundamentals in graphic design.		3 hours
9.1.7 Graphics in marketing or non-verbal component in communication.		3 hours
9.1.8 Computerized processing of the image.		3 hours
9.1.9 Creative strategies in promoting engineering services.		2 hours
9.1.10 Innovation strategies in promoting engineering services.		2 hours
<p>Reading list for the lecture:</p> <ol style="list-style-type: none"> 1. Alfakrah, A. K., Alfakrah, B. K., Alomari, H. M., Aldagani, A., Visual Impact: Exploring the Crucial Role of Graphic Design in Contemporary Marketing, 2024 2. Drewniany, B. I., Jewler, A. J., Strategii creative în publicitate, Thomson Wadsworth, 2008 3. Mariotti, S., Entrepreneurship: Owning Your Future, 11th Edition, Pearson, 2009 4. Olins, W., Corporate Identity, Gower, 2002 5. Richardson, B., Marketing for Architects and Engineers: A New Approach, Taylor & Francis e-Library, 2005 6. Wang, X., Visual Communication and Branding: The Role of Graphic Design in Building Brand Image and Recognition, 2024 7. Wheeler, A., Designing Brand Identity, John Wiley & Sons, Inc., Hoboken, New Jersey, 2018 8. Yasakova, K., Research into Aesthetic Trends in Advertising and Design and Their Impact on Enhancing Consumer Appeal, 2025 		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam/ 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	- systematic observation of students (case study)	60%	100%
		- formative assessment test (tests during the semester)	-	
		- summative assessment test (final assessment)	40%	
10.6 Passing requirements				
Minimum passing grade: 5.				

Date of completion: September 2025

Lecture instructor:

Lecturer Claudia - Ioana CIOBANU, 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) x 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	Dezvoltarea antreprenorială inovativă în construcții Innovative entrepreneurial development in Civil Engineering						
2.1.2. Course code	CE122						
2.2 Lecture instructor	Senior Lecturer Claudiu Romila, PhD						
2.3 Seminar/laboratory/project/practical session instructor	Senior Lecturer Claudiu Romila, PhD						
2.4 Year of study ²	1	2.5 Semester ³	1	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	2	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	28	3.5 lecture	28	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										12	
Additional research in the library, on specialised electronic platforms, and in the field										6	
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	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	Not applicable
4.2 Learning outcomes prerequisites	Not applicable

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 seminar / laboratory / project 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

The general objective of the Innovative Entrepreneurial Development in Civil Engineering course is to develop an innovative entrepreneurial mindset by understanding the civil engineer's role as a generator of economic and social value, capable of identifying technological opportunities and designing sustainable business models within the current context of the construction industry.

7. Learning outcomes¹⁴

Knowledge	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - knows the fundamental concepts of innovative entrepreneurship, including types of innovation, product life cycles, and their role in the construction field; - understands the operational mechanisms of the construction industry and the impact of economic, technological, and environmental factors on the development of innovative products and services; - Identifies business opportunities and creates a business plan; - understands the principles of innovation management applied in the design, execution, and post-occupancy of constructions; - is familiar with digital tools and emerging technologies (e.g., BIM, AI, 3D printing); - understands the importance of the circular economy, green and blue economies, sustainability, and ethics in the implementation of innovative entrepreneurial initiatives
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - identifies and evaluates innovative business opportunities in the construction field; - develops and argues for a business plan for an innovative product or service; - applies innovation management principles in the development of technological and programming solutions within the construction sector; - conducts market analyses, product design, and project management in technological entrepreneurship; - identifies risk and success factors of business plans; - collaborates effectively in multidisciplinary teams.
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - respects the principles, norms, and ethical values in the correct and timely execution of professional tasks; - integrates into workgroups and applies networking and efficient work techniques within multidisciplinary teams across various hierarchical levels; - manifests critical thinking and rigor in the performance of tasks; - stays permanently informed and documented in their specific field of activity by appropriately using effective 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 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
1. Introduction to entrepreneurship. The entrepreneur's profile and aptitudes. Creating a culture for innovative entrepreneurship	Interactive lecture, debates, explanations	4 hours
2. Barriers to innovation. Innovative projects		4 hours
3. Entrepreneurship in construction. Current trends in the construction industry		2 hours
4. General economic principles		4 hours
5. Identifying Business Opportunities. Initiating a Business. Identifying Necessary Resources		2 hours
6. Identifying business financing opportunities		2 hours
7. Structuring of the new business – Business Model Canvas		4 hours
8. Business development strategies		2 hours
9. Business legislation and ethics		2 hours
10. Sustainability and the circular economy. The "green" and "blue" economies		2 hours
<p>Reading list for the lecture:</p> <ol style="list-style-type: none"> 1. Sorin-Gabriel ANTON et al., „Antreprenoriat – înființarea, finanțarea și managementul noilor afaceri, Editura Universității Alexandru Ioan Cuza Iași”, 2018 2. Corneliu MUNTEANU et al., „Marketing – Principii, practice, orizonturi”, Editura Sedcom Libris, 2008 3. Panaite NICA et al. – ”Managementul organizației – concept și practici”, Editura Sedcom Libris, 2014 		

4. Richard Swedberg, "The Social Science View of Entrepreneurship: Introduction and practical Applications", in Entrepreneurship: The Social Science View, Oxford: Oxford University Press, 2000
5. Peter Boettke and Christopher Coyne, „Context Matters: Institutions and Entrepreneurship”, in Entrepreneurship, vol.5, 2008-2009
6. David Audretsch and D. Erdem, „Factors Affecting Entrepreneurial Activity”, in Handbook of Entrepreneurial Research, eds. S.Alvarez et al., Springer, 2005
7. Donald F. Kuratko, "Entrepreneurship: Theory, Process, and Practice. Cengage Learning", 2017
8. Israel M.Kirzner, "The entrepreneurship Process", in Entrepreneurship: The Social Science View, Oxford: Oxford University Press, 2000

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	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)	25%	100% (min. 5)
		- formative assessment test (tests during the semester)	25%	
		- summative assessment test (final assessment)	50%	
10.6 Passing requirements The student must be familiar with the fundamentals of the innovative entrepreneurship concept, legislative frameworks, and the notions regarding the initiation, development, management, and protection of a business.				
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

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	Inițiere în creația tehnică An Introduction to Technical Creativity						
2.1.2. Course code	CE123						
2.2 Lecture instructor	Lecturer Oana NECULAI, PhD						
2.3 Seminar/ laboratory/ project/practical session instructor(s)	-						
2.4 Year of study ²	1	2.5 Semester ³	2	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	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										10
Additional research in the library, on specialised electronic platforms, and in the field										6
Preparation for seminar/laboratory/project session, assignments, papers, and portfolios										6
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	Blackboard, video projector, specific teaching materials.
5.2 for the seminar / laboratory / project ¹³	NA

6. General objective of the course

This course provides an overview of the development of the human mind and the role of technical creativity in the evolution of humanity. It explores the relationship between personality, creativity, and the innovation process, highlighting the stages of technical creation and the factors that may stimulate or inhibit creative thinking. Students will learn practical methods and tools for idea generation and organization, such as brainstorming, the Six Thinking Hats method, idea diagrams, and the spatial morphological matrix of ideas. In addition, the course develops the ability to synthesize information and to complete creative projects through creative design and technical validation.

7. Learning outcomes¹⁴

Knowledge	<p>The student / graduate:</p> <ul style="list-style-type: none"> - explains how the human mind and technical creativity have evolved throughout the history of humanity; - compares different forms of expression of technical creativity, such as inventions, innovations, and discoveries; - evaluates the role of creative technology in personal and professional development; - defines the fundamental concepts related to creativity, mind, and personality; - describes the stages of the technical creation process and the factors influencing creativity; - uses methods and techniques for stimulating creativity in problem-solving; - applies the stages of technical creation to identify and solve practical problems.
Skills	<p>The student / graduate:</p> <ul style="list-style-type: none"> - uses methods for idea generation and organization (brainstorming, the Six Thinking Hats method, idea diagrams, morphological matrix); - sketches concepts, ideas, or creative solutions within the design process; - presents the developed creative solutions, providing logical and technical justification; - modifies and improves the proposed solutions based on analysis, feedback, and technical validation.
Responsibility and autonomy	<p>The student / graduate:</p> <ul style="list-style-type: none"> - adheres to ethical principles and professional values in the process of creation and innovation; - integrates into teamwork activities, actively contributing to the generation of ideas and solutions; - keeps informed and continuously documents modern methods for stimulating creativity and innovation; - develops creative projects with technical applicability; - adapts to the requirements of the professional environment by applying creative thinking and innovative solutions.

8. Teaching strategies

In the teaching activity, participatory lectures and debates based on PowerPoint presentations will be used, which will be available for the students. The presentations contain images, sketches, and calculation formulas so that the information is easy to understand and assimilate. Each lecture will begin with a brief recall of the concepts covered in the previous session.

The teaching method is also based on discovery-learning models, facilitated by the direct and indirect exploration of reality (laboratory visits, demonstrations), as well as on action-based methods such as exercises, practical activities, and problem-solving.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation
9.1.1. History of humans 9.1.1.1. The place and role of technical creativity in the development of humanity 9.1.1.2. The evolution of humanity through creative technology; forms of expression: innovations, inventions, discoveries	Interactive lecture, debates, explanations	4 hours
9.1.2. The human mind and personality 9.1.2.1. Personality tests – Self-awareness as a means of identifying areas for improvement 9.1.2.2. Creativity blockages		4 hours
9.1.3. Stages of technical creation: information gathering, problem generation, solution searching, incubation, illumination, and technical validation		4 hours
9.1.4. Information synthesis within a specific field		2 hours
9.1.5. Methods for stimulating creativity 9.1.5.1. Creative exercises 9.1.5.2. Brainstorming 9.1.5.3. The Six Thinking Hats method		6 hours
9.1.6.1. Idea diagrams		2 hours
9.1.7. Morphological spatial matrix of ideas		4 hours
9.1.8. Finalization stages of technical creativity: creative design and technical validation		Interactive lecture, debates, explanations, brainstorming

Reading list for the lecture:

1. Vitalie Belousov – Creatia tehnică, Editura Junimea 1986
2. Alexandru Stanila – Constructii si inventică, Editura Cermei 1998
3. Gardner Howard - Les formes de la créativité, Edition Odile Jacob, Paris, 2001
4. Mircescu Mihai – Antrenamentul creativității. Ghid practic de metode, procedee și exerciții, Editura Eurobit S.R.L., Timișoara, 1997
5. Roco Mihaela – Creativitate și inteligență emoțională, Editura Polirom, Iași, 2001.
6. "Creativity" - Encyclopedia Britannica 2009 (05 Jun. 2009)
7. Hollanders, H. & van Cruysen, Adriana (2009), Design, Creativity and Innovation: A Scoreboard Approach, February 2009
8. Gorny, Eugene (Ed.), (2007), A Dictionary of Creativity: Terms, Concepts, Theories & Findings in Creativity Research.Netslova.ru, October 2007
9. Alexandru Stanila –Inițiere in Inventica, Editura Cermei 2012
10. Lehrer, Jonah – Imagine: How Creativity Works, Houghton Mifflin, 2012
11. Ashton, Kevin – How to Fly a Horse: The Secret History of Creation, Invention, and Discovery, Doubleday, 2015
12. Kaufman, James C. & Glăveanu, Vlad P. (eds.) – The Cambridge Handbook of Creativity, Cambridge University Press, 2019
13. Plucker, Jonathan A. (ed.) – Creativity and Innovation: Theory, Research, and Practice, Routledge, 2022
14. de Villiers, Rouxelle (ed.) – The Handbook of Creativity & Innovation in Business: A Comprehensive Toolkit of Theory and Practice for Developing Creative Thinking Skills, Springer Nature, 2022
15. Csikszentmihalyi, Mihaly – Creativitate. Rolul fluxului în psihologia descoperirii și a inventării, Curtea Veche Publishing, 2023
16. Espírito Santo, Luís, Wiggins, Geraint & Cardoso, Amílcar – Towards a Formal Creativity Theory: Preliminary Results in Novelty and Transformativeness, 2024
17. Copley, David H. (ed.) – Creations: The Nature of Creative Products in the 21st Century, Palgrave Macmillan, 2025
18. Gaggioli, Andrea, Bartolotta, Sabrina & Ubaldi, Andrea (și alții) – Extended Creativity: A Conceptual Framework for Understanding Human-AI Creative Relations, 2025
19. Verger, Nicolas B., Zheng, Mei & Shankland, Rebecca (eds.) – Creativity, Oxford University Press, 2026

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)	50%	100%
		- formative assessment test (tests during the semester)	25%	
		- summative assessment test (final assessment)	25%	

10.6 Passing requirements

The student must demonstrate an understanding of the fundamental concepts of creativity, mind, and personality, as well as how creative technology has influenced the evolution of humanity.

The student must be able to apply practical methods for stimulating creativity, generate and organize ideas using specific tools such as brainstorming, idea diagrams, and morphological matrices, and integrate them into a creative project.

Additionally, the student must be able to justify the proposed solutions, modify, and technically validate them, while adhering to ethical principles and working effectively in a team.

The student must also attend at least half of the scheduled course sessions.

Date of completion: September 2025

Lecture instructor:

Lecturer Oana NECULAI, PhD

Seminar/ laboratory/ project/ practical session instructor(s):

-

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	Urbanism și Amenajarea Teritoriului Urban Planning and Landscaping						
2.1.2. Course code	CE126						
2.2 Lecture instructor	Lecturer Daniel COVATARIU, PhD						
2.3 Seminar/ laboratory/ project/ practical session instructor(s)	-						
2.4 Year of study ²	1	2.5 Semester ³	2	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	2	3.3a seminar		3.3b laboratory		3.3c project		3.3.d practica	
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											6
Additional research in the library, on specialised electronic platforms, and in the field											12
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	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	Classroom equipped with computer and video projection equipment, blackboard; when necessary, the course can be held online (on educational platforms such as Google Meet/Classroom, Microsoft Teams, Zoom with academic subscriptions), with the necessary equipment for a video-conference (computer, video camera, microphone, speakers/headphones, (high-speed) access to the Internet network (for quality streaming) 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
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6. General objective of the course

Familiarizing first-year students with general notions, concepts, and terminology specific to territorial and regional planning, as well as the elements that make up their legal, institutional and procedural framework.

Developing the capacity to understand the importance of UP&L and to evaluate/interpret documentation specific to territorial and zonal planning.

7. Learning outcomes¹⁴

Knowledge	<p>The student:</p> <ul style="list-style-type: none"> - identifies, evaluates, and explains the constructive composition of different categories of buildings and their locations, for the purpose of preparing and using specific technical documentation; - analyses different types of urban planning documentation, using specific planning methods and interprets the results obtained, in order to identify the optimal solution to solve specific problems.
Skills	<p>The student:</p> <ul style="list-style-type: none"> - designs urban planning solutions, following the legislation, relevant standards, and decisions of the local community, for engineering problems of medium complexity that meet the specified needs, respecting public health, safety, welfare, environmental, sustainability and economic factors, as well as other specific constraints; - develops technical drawings of zonal or detailed planning; - applies minimal project management techniques, territorial planning / administration techniques, and decision-making in a multidisciplinary and collective framework.
Responsibility and autonomy	<p>The student:</p> <ul style="list-style-type: none"> - 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; - integrates into the work group and applies techniques for networking and efficient work in multidisciplinary teams, on various hierarchical levels; - is constantly informed and documented in his/her field of activity by appropriately using effective learning methods and techniques;

8. Teaching strategies

The teaching activity will use participatory lectures based on Power Point presentations that will be made available to students. The presentations contain images, multimedia presentations, sketches and drawings, so that the information is easy to understand and assimilate.

The teaching activity is complemented by the analysis of various case studies (examples of good practice), as well as bibliographic study in the library.

9. Content

9. 1. Lecture ¹⁵	Teaching strategies	Time allocation	
Lecture I – Introduction (concepts, specialized terminology, regional and national context)	Interactive lecture on electronic support (Power Point), discussions, debates, explanations, case study analyses	2 hours	
Lecture II – Landscaping / Spatial Planning (definition, brief history, specific objectives, and documentation);		2 hours	
Lecture III – Urban planning (definition, historic approaching, specific objectives, and documentation);		2 hours	
Lecture IV – Urban Planning & Landscaping legislative framework in Romania (history, content, evolution, trends)		2 hours	
Lecture V-IX – Framework-content of the documentation on Urban Planning and Landscaping: - methodology for developing UP&L and the attributions of the administrations; - guidelines and framework-content of the G.U.P., Z.U.P, D.U.P. (specific methodology) and the administration's attributions;		10 hours	
Checking test #1		2 hours	
Lecture X – The flowchart of urban's documentations (initiative, elaboration, analyse, public debate, noticing, approval, implementation, penalties)		2 hours	
Lecture XI – Public administration tasks regarding the activities of territorial/urban planning. Public policies and principles for local/regional sustainable development.		2 hours	
Lecture XII – Components of the local administration system (territory / locality / land / constructions) and their management; related documentation.		2 hours	
Checking test #2		2 hours	
Reading list for the lecture: 1. Barbara C. Colley, P.E. (2005) - " <i>Practical Manual of Land Development</i> ", McGraw-Hill Companies, 4th edition, DOI: 10.1036/0071448667			

2. “*Land Development Handbook – Planning, Engineering and Surveying*”, 2nd edition, Digital Engineering Library @ McGraw-Hill (www.digitalengineeringlibrary.com)
3. Thomas H. Russ, RLA (2009) – “*Site Planning and Design Handbook*”, The McGraw-Hill Companies, ISBN: 978-0-07-160559-5
4. Legea nr. 350 din 6 iulie 2001 privind amenajarea teritoriului și urbanismul publicat în M. Of. nr. 373/10 iul. 2001, cu modificările și completările ulterioare (actualizată la 13.05.2020);
5. Ghiduri privind metodologia de elaborare și conținutul-cadru al PUG, PUZ, PUD

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method	10.3 Percentage of final grade
10.4 Periodic verification tests (Vp)	Completeness and correctness of knowledge. Logical coherence, fluency, argumentative force. Capacity for analysis, personal interpretation, originality, creativity. Degree of assimilation of specialized language and communication ability. Ability to capitalize on acquired skills. Ability to process data and stated problems.	Checks during the semester: Evaluation of the knowledge acquired in the course by completing two evaluation tests:	
		- test in week 7 (20 questions)	50 %
		- test in week 14 (20 questions)	50 %
10.6 Passing requirements Solving at least 21 questions (out of the total of 40 questions found in the 2 multiple-choice tests – each consisting of 20 questions), with multiple-choice answers required.			
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 Daniel COVATARIU, PhD

Seminar/ laboratory/ project/ practical session instructor(s):

-

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) x 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	Psihologia Educației Educational Psychology						
2.1.2. Course code	CE127						
2.2 Lecture instructor	Lecturer Magda TUFEANU						
2.3 Seminar instructor	Lecturer Oana JITARU						
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Assessment method ⁴	E	2.7 Course type ⁵	DL

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										46	
Additional research in the library, on specialised electronic platforms, and in the field										8	
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	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	

5. Requirements

5.1 for the lecture ¹²	Blackboard, video projector, flipcharts
5.2 for the seminar ¹³	Blackboard, video projector, flipcharts, informational materials, worksheets

6. General objective of the course

The general objective of the Educational Psychology discipline is to provide a complex of specialized information and models of good practices used in working with students, which will constitute the necessary foundation for the professional and personal training of students following the psycho-pedagogical module.

7. Learning outcomes:¹⁴

Knowledge	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - Argues the relationships between teaching-learning-evaluation and formulates some creative solutions for optimizing educational components; - Correlates specialized, psycho-pedagogical knowledge in carrying out instructional-educational activities in education and other educational activities; - Argues the formative potential of theories, principles, and didactic practices specific to the field; - Identifies the specific way in which children/students/youth learn, theories and paradigms of counselling and support regarding learning and the implications for teaching and evaluation; - Analyses and correlates psycho-pedagogical knowledge in training activities and continuous improvement of professional practices.
Skills	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - Identifies the level of previous acquisitions of children/students/youth, individually and as a group, and uses the data obtained in the design of the educational process; - Identifies learning objectives in accordance with the curricular documents, which support the development of the potential of each child/student/youth; - Builds authentic learning contexts, in an integrated manner, in which students capitalize on their life experiences and knowledge interests; - Participates periodically in continuous professional development activities, in relation to their own professional needs and local or national priorities.
Responsibility and autonomy	<p>The student/ graduate:</p> <ul style="list-style-type: none"> - Critically addresses the responsibilities of the teaching profession, highlighting the complexity of the educational process; - Develops creative and constructive attitudes in the application of pedagogical design and principles. - Indicates the need to use a variety of resources to make teaching more efficient, support learning and support students in their autonomous use; - Communicates effectively by providing constructive feedback and supports the active involvement of students in their own learning process; - Defends/Respects the ethnic, socio-economic, linguistic, and religious diversity of students and their communities of origin and manages their implications for development and learning; - Supports the socio-emotional and moral development of students; - Supports the family/guardians to understand the expectations and role of the school, collaborating with them for the educational success of students; - Combines interrogative and reflective approaches to professional practice and engagement in professional training and continuing education; - Displays/Manifests professional balance and ability to adapt in different contexts, including new or stressful situations, while maintaining appropriate authority in relation to individuals/educational groups.

8. Teaching strategies

Various teaching methods will be used in the teaching activity, such as: lecture, explanation, description, conversation, collective discussion, problematization, etc.

9. Content

9. 1. Lecture¹⁵	Teaching strategies	Time allocation
9.1.1. Introduction to the field of Educational Psychology. Educational Psychology as a science. Definition. Delimitation of the field of Educational Psychology. The status and role of the teacher. The status and role of the student.	Interactive lecture, discussions, debates, explanations	2 hours
9.1.2. Human personality Human psychic system. Factors of personality development. Constitutive, defining elements of personality. Factor models of personality (Guilford, Garden). Process models of personality (Freud, Erikson, Piaget). Characterization of school ages.	Interactive lecture, debates, explanations	6 hours
9.1.3. Stages of ontogenetic development Conceptual delimitations. Explanatory theories of human development (cognitive development, moral development, psychosocial development).	Interactive lecture, discussions, debates, explanations	6 hours
9.1.4. Human learning and school learning		6 hours

Learning in the aggregate of human activities. Learning as a process. Forms of elementary learning: conditioning, association, imitation. Forms of verbal learning: learning concepts and principles, problem solving. Theories of learning. E-learning. Online learning.		
9.1.5. Motivation for learning Components of motivation. The process of motivation. Explanatory theories. Motivation for learning. Strategies for motivating students in online learning.	Interactive lecture, discussions, debates, explanations	4 hours
9.1.6. Creativity at School Age Definition. Creativity as a Process and as a Product. Creative Personality. The Role of Creativity in Learning. Stimulating Student Creativity in Online Education.		2 hours
9.1.7. Review and exam topics Review of the main topics covered in the course. Discussion of exam topics.	Course concept map	2 hours
Reading list for the lecture: 1. Albulescu, I., Catalano, H., (2021), e-Didactica – Procesul de instruire în mediul online, Ed. DPH, București 2. Bocoș, M. D., (2013), Instruirea interactivă, Ed. Polirom, Iași 3. Carcea, I M, (coord) (2002), Psihologia educației, Ed. Gh. Asachi, Iași 4. Carcea, I. M. (2000), Mediul educațional școlar, Ed. Cerami, Iași 5. Ceobanu, C., (2016), Învățarea în mediul virtual, Ed. Polirom, Iași 6. Ceobanu, C., et. al. (2020), Educația digitală, Ed. Polirom, Iași 7. Cosmovici, A., (coord) (2002), Psihologia educației, Ed. Polirom, Iași 8. Mih, V., (2010) Psihologie educațională (vol. I și II), Ed. ASCR, Cluj 9. Neacșu, I., (2015) Metode și tehnici de învățare eficientă, Ed. Polirom, Iași 10. Negovan, V., (2013) Psihologia învățării. Forme, strategii și stil, Ed. Universitară, București 11. Paloș, R., (2013), Psihologia educației între teorie și practică, Ed. Didactică și Pedagogică, R.A., București 12. Tiron, E., (2000) Psihologie educațională, Ed. Gh. Asachi, Iași. 13. Articole Tufeanu Magda pe https://scholar.google.com/citations?user=84Qj39sAAAAJ&hl=ro		
9.2a Seminar	Work methods ¹⁶	Observations, allotted time
1. Introduction to Educational Psychology	Teamwork Exercises Case Analysis Panel Discussion	2 hours
2. Understanding Student Personality		6 hours
3. Developmental Theories – Applications		6 hours
4. Learning in the School Environment – Applications		6 hours
5. Motivation for Learning – Applications		4 hours
6. Creativity – Applications		4 hours
Reading list for the seminar / laboratory / project: 1. Albulescu, I., Catalano, H., (2021), e-Didactica, Ed. DPH, București 2. Cosmovici, A., (coord) (2002), Psihologia educației, Ed. Polirom, Iași 3. Mih, V., (2010) Psihologie educațională (vol. I și II), Ed. ASCR, Cluj 4. Neacșu, I., (2015) Metode și tehnici de învățare eficientă, Ed. Polirom, Iași 5. Negovan, V., (2013) Psihologia învățării. Forme, strategii și stil, Ed. Universitară, București 6. Paloș, R., (2013), Psihologia educației între teorie și practică, Ed. Didactică și Pedagogică, R.A., București 7. Tiron, E., (2000) Psihologie educațională, Ed. Gh. Asachi, Iași		

10. Assessment

Assessment category	10.1 Assessment criteria	10.2 Assessment method		10.3 Percentage of final grade
10.4 Final exam/ /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	- systematic observation of students (individual or group assignments – which must be completed during the week between lectures, preparation of a report, case study)		100%
		- formative assessment test (tests during the semester)		
		- summative assessment test (final assessment)	100%	
10.5a Seminar	Ability to apply acquired knowledge Capacity for analysis, personal interpretation, originality, creativity	- active participation in the activities - assessment test		
10.6 Passing requirements: Final grade minimum 5				

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 Magda TUFEANU

Seminar instructor:

Lecturer Oana JITARU

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.

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.

FIȘA DISCIPLINEI

Anul universitar 2025-2026

1. Date despre program

1.1 Instituția de învățământ superior	Universitatea Tehnică „Gheorghe Asachi” din Iași
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	Pedagogie I (Fundamentele educației. Teoria și metodologia curriculumului) Pedagogy I (The Fundamentals of Pedagogy. Curriculum Theory and Methodology)						
2.1.2. Codul disciplinei	CE128						
2.2 Titularul activităților de curs	Lector univ. dr. Oana JITARU						
2.3 Titularul activităților de aplicații (S)	Lector univ. dr. Oana JITARU						
2.4 Anul de studii ²	1	2.5 Semestrul ³	2	2.6 Tipul de evaluare ⁴	E	2.7 Tipul disciplinei ⁵	DL

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

3.1 Număr de ore pe săptămână	4	3.2 curs	2	3.3a sem.	2	3.3b laborator	3.3c proiect	3.3.d practică
3.4 Total ore din planul de învățământ ⁶	56	3.5 curs	28	3.6a sem.	28	3.6b laborator	3.6c proiect	3.6.d
Distribuția fondului de timp ⁷								Nr. ore
Studiul după manual, suport de curs, bibliografie și notițe								50
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate și pe teren								6
Pregătire seminarii/laboratoare/proiecte, teme, referate și portofolii								13
Examinări ⁸								4
Alte activități:								
3.7 Total ore studiu individual ⁹	69							
3.8 Total ore pe semestru ¹⁰	125							
3.9 Numărul de credite	5							

4. Precondiții (acolo unde este cazul)

4.1 de curriculum ¹¹	
4.2 de rezultate ale învățării	Identifică obiective de învățare în acord cu documentele curriculare, care să susțină dezvoltarea potențialului fiecărui copil/elev/tânăr.

5. Condiții

5.1 de desfășurare a cursului ¹²	Tablă interactivă/ fleetchart; videoproiector/ laptop.
5.2 de desfășurare a seminarului / laboratorului / proiectului ¹³	Tablă interactivă/ fleetchart; videoproiector/ laptop; fișe de lucru pentru aplicații; consumabile (birotică).

6. Obiectiv general disciplinei

Familiarizarea studenților cu conceptele fundamentale ale pedagogiei ca știință, cu specificul, funcțiile și rolul acesteia în cadrul mai larg al sistemului științelor educației

7. Rezultatele învățării¹⁴

Cunoștințe	<p>Studentul/ Absolventul:</p> <ul style="list-style-type: none"> - Prezintă conținuturile specifice domeniului și corelează principalele teorii și orientări metodologice ale învățării din perspective proiectării/ designului pedagogic; - Descrie conceptele, teoriile, principiile, procedeele și metodele specifice domeniului educational; - Dezvoltă și experimentează modele/ structuri adaptabile în raport cu evoluția paradigmelor pedagogice; - Identifică valorile, principiile, paradigmele și conceptele fundamentale de proiectare, dezvoltare, implementare și evaluare a curriculumului, instruirii și de structurare a procesului didactic; - Explică (Stabilește/simenține) normeșiregulicomportamentale/ de organizare a activităților educaționale, facilitând responsabilizarea copiilor/elevilor/tinerilor, respectul reciproc și relațiile de încredere; - Analizează și corelează cunoștințele psihopedagogice în activitățile de formare și de îmbunătățire continuă a practicilor profesionale; <p>Integrează normele de etică, de integritate academică și de conduită profesională</p>
Aptitudini	<p>Studentul/ Absolventul:</p> <ul style="list-style-type: none"> - Aplică curriculumul cu parcurgerea etapelor și metodologiilor specifice de realizare a activităților din procesul educational; - Organizează activitățile educaționale și strategiile utilizate pentru formarea copiilor/elevilor/ tinerilor/grupurilor prin raportare la standarde și obiective menționate în documente curriculare; - Identifică obiective de învățare în acord cu documentele curriculare, care să susțină dezvoltarea potențialului fiecărui copil/ elev/ tânăr; - Adaptează conținuturi relevante pentru dezvoltarea competențelor specifice, urmărite conform curriculumului; - Utilizează/Identifică documentele programatice ale unității de învățământ ca support pentru luarea unor decizii manageriale în diferite contexte educaționale; - Pregătește, valorifică spațiile alternative, în afara sălii de clasă sau unității de învățământ, pentru experiențe semnificative de învățare; - Aplică reglementările legale care privesc sistemul de învățământ și politicile educaționale curente; - Inițiază colaborări în dezvoltarea sustenabilă a școlii, prin inițierea și derularea unor acțiuni specifice la nivel de instituție
Responsabilitate și autonomie	<p>Studentul/ Absolventul:</p> <ul style="list-style-type: none"> - Utilizează autonom norme, standarde, obiective curriculare și metodologii specifice în proiectarea și / sau implementarea programelor / proiectelor/intervențiilor/actiunilor educaționale; - Abordează critic responsabilitățile profesiei didactice cu evidențierea complexității procesului de învățământ; - Comunică eficient prin oferirea de feedback constructive și susține implicarea activă a elevilor în propriul proces de învățare; - Menține o atmosferă pozitivă în clasă și în școală, cultivând apartenența la comunitatea educațională; - Susține în mod specializat promovarea corectitudinii, obiectivității, justiției și adoptă practice educaționale stimulative și nediscriminatorii; - Exprimă încredere în potențialul de dezvoltare al fiecărui copil/elev/tânăr și susține aspirațiile acestuia, prin abordări didactice diferențiate și individualizate; - Susține dezvoltarea socio-emoțională și morală a elevilor; - Adaptează conduita pe baza reflecției asupra stereotipurilor și preconcepțiilor legate de rasă, etnie, gen, statut socio-economic și cultural, vârstă, abilitate, religie sau naționalitate; - Manifestă atitudini pozitive, active, creative și reflexive, a spiritului critic față de profesia didactică și propria formare continuă; - Promovează imaginea instituției și a propriei profesii prin implicarea în diverse proiecte/programe educaționale; - Gestionează mediul digital educațional în siguranță, responsabil și etic, în acord cu caracteristicile și nevoile copiilor/elevilor/tinerilor în scopul eficientizării învățării

8. Metode de predare

În activitatea de predare vor fi utilizate metode didactice atât tradiționale (expunerea; conversația; studiul de caz; problematizarea; jocul de rol etc.), cât și interactive (mozaic; tehnica Frisco; metoda piramidei; predarea-învățarea reciprocă etc.). Vor fi utilizate mijloace didactice precum: prezentări Power Point; aplicații digitale utilizate pentru sistematizarea și recapitularea cunoștințelor; fișe; filme documentare etc.). Organizarea activității didactice va respecta design-ul activităților de formare aspecifice formării adulților, integrând armonios noile cunoștințe cu cele transmise anterior și valorificând experiența de învățare/ viață a studenților în analiza aplicațiilor propuse.

9. Conținuturi

9. 1. Curs ¹⁵	Metode de predare	Timp alocat
9.1.1.Pedagogia și sistemul științelor educației. Educația ca obiect de studiu al pedagogiei. Funcții ale educației. Factorii educației.	Prelegere interactivă,	2 ore
9.1.2. Formele educației: formală, nonformală, informală.	Conversația	4 ore

9.1.3. Componentele educației: educația intelectuală, educația moral-civică, educația tehnologică, educația estetică, educația profesională, educația fizică.	Explicația Dezbaterea	6 ore	
9.1.4. Problematika lumii contemporane și noile educații.		2 ore	
9.1.5. Problematika teoriei curriculumului.		2 ore	
9.1.6. Tipuri de curriculum.		2 ore	
9.1.7. Finalitățile educației: conceptualizare, istoric.		2 ore	
9.1.8. Ideal, scop, obiective. Învățământ centrat pe competențe.		4 ore	
9.1.9. Conținuturi curriculare.		2 ore	
9.1.10. Produse curriculare: plan cadru de învățământ, programă școlară, manuale alternative, ghidurcurriculare, materiale suport.		2 ore	
Bibliografie curs:			
<ol style="list-style-type: none"> Bobu, R., Pedagogie I- suport de curs, ediția 2022-2023, https://dppd.tuiasi.ro/wp-content/uploads/2022/01/Pedagogie-I-suport-curs.pdf Bocoș, M., Didactica disciplinelor pedagogice, ediție revizuită, Editura Paralela 45, Pitești, 2017. Cristea, S., Dicționar enciclopedic de pedagogie, Editura Didactica PublishingHouse, București, 2015. Cristea, D., Pegagogie. Teoria generală a educației, Editura DPH, 2022. Cristea, S., Curriculum. Concepte fundamentale în pedagogie, vol. 13, Editura DPH, 2023. Cucoș C., Educația. Reîntemeieri, dinamici, prefigurări, Editura Polirom, Iași, 2017. Cucoș, C., Pânișoară, I.O., Istrate, O., Ceobanu, C., Educația digitală, Editura Polirom, Iași, 2022. Cucoș, C., Pedagogie, ediția a III-a revăzută și adăugită, Editura Polirom, Iași, 2014. Frumos, F., Labăr, A., Formarea pentru cariera didactică, Editura Universității A.I. Cuza, Iași, 2021. Istrate, O., Ceobanu, C., Velea, S., Pedagogie digitală, Editura Polirom, Iași, 2025. Jonnaert, P., Ettayebi, M., Defise, R., Curriculum și competențe un cadru operaționale, Editura ASCR, Cluj Napoca, 2010. Manasia, L., Ianos, M.G., Pedagogie co-creării, editura universitară, București, 2022. Marin, T., Marin, L.M., Pedagogie. Compediu, Editura pro Universitaria, București, 2024. Marzano R., Arta și știința predării. Un cadru cuprinzător pentru o instruire eficientă, Editura Trei, București, 2015. Momanu, M., Introducere în teoria educației, editura Polirom, Iași, 2002. Noveanu, E., Potolea, D., Științele educației. Dicționar enciclopedic, editura Sigma, București, vol. I, II, 2008. Păun, E., Potolea, D., Pedagogie. Fundamente teoretice și demersuri aplicative, Editura Polirom, Iași, 2002. Pânișoară, I. O, Ghidul profesorului, editura Polirom, Iași, 2017. Repere pentru proiectarea și actualizarea Curriculumului național. Cadru de referință al Curriculumuluinațional, https://www.educred.ro/resurse-cred/ Strunga, A., Introducere în teoria curriculumului, editura Universitară, București, 2020 Văideanu, G., Educația la frontiera dintre milenii, Editura Politică, București, 1988. Cristea, S., Pânișoară, I.O., Manual de pedagogie pentru profesori, Editura Polrom, Iași, 2024. 			
9.2a Seminar	Metode de lucru ¹⁶	Observații, timp alocat	
9.2.1. Prezentare tematică, bibliografie, obiective și criterii de evaluare.	Exerciții individuale/ grup Studii de caz Jocuri de rol Discuția panel	2 ore	
9.2.2. Formele educației: formală, nonformală și informală. Exerciții de analiză comparativă.		2 ore	
9.2.3. Dimensiuni clasice ale educației. Analiză dimensiuni prin activități de grup.		2 ore	
9.2.4. Noile educații. Interdependența acestora cu formele educației. Activități de grup.		2 ore	
9.2.5. Conceptul de „curriculum” și noua viziune curriculară: ce este și ce nu este curriculum; curriculumvs instruire. Exerciții și activități de grup.		2 ore	
9.2.6. Finalitățile educaționale: tipuri de finalități. Operaționalizarea obiectivelor educaționale. Exerciții de operaționalizare a obiectivelor educaționale.		6 ore	
9.2.7. Documente de proiectare curriculară. Planul cadru de învățământ: analiză structură. Schema orară. Programa școlară: analiză, structură.		2 ore	
9.2.8. Programa de opțional. Elaborare programă disciplină opțională la inițiativa cadrului didactic. Prezentare, analiză modele. Exerciții de elaborare programă pentru disciplină opțională.		4 ore	
9.2.9. Manuale și auxiliare didactice. Analiză manuale, auxiliare didactice, manual digital.		2 ore	
9.2.10. Proiectare curriculară. Elaborare de documente specifice - proiectare anuală/planificare calendaristică.		2 ore	
9.2.11. Seminar sinteză: analize,dezbateri, evaluareaactivității de seminar.		2 ore	
Bibliografie aplicații (seminar):			
<ol style="list-style-type: none"> Bobu, R., Pedagogie I – seminar (prezentare power-point), ediția 2022-2023, https://dppd.tuiasi.ro/wp-content/uploads/2022/01/Pedagogie-I-seminar.pdf Bobu, R., Pedagogie II – seminar, ppt, ediția 2022-2023 Bocoș, M., D., Jucan, D., Teoria și metodologia instruirii. Teoria și metodologia evaluării. Repere și instrumente didactice pentru formarea profesorilor, ediția a IV-a, Editura Paralela 45, Pitești, 2019 Cristea, D., Pegagogie. Teoria generală a educației, Editura DPH, 2022 Cristea, S., Curriculum. Concepte fundamentale în pedagogie, vol. 13, Editura DPH, 2023 Cucoș, C., Pânișoară, I.O., Istrate, O., Ceobanu, C., Educația digitală, Editura Polirom, Iași, 2022 Cucoș, C., Pedagogie, ediția a III-a revăzută și adăugită, Editura Polirom, Iași, 2014, https://dppd.tuiasi.ro/wp-content/uploads/2022/01/Pedagogie-II-seminar-1.pdf 			

8. Iordache, T., Irimia, M., Fartușnic, C., Preoteasa, L., Telișeanu, A., Stoica, E., Șăitan, T., Horga, I., Dragomir, P. & Palade, E., Metodologie pentru dezvoltarea curriculumului la decizia școlii, 2020, <https://www.educred.ro/resurse-cred>
9. Istrate, O., Ceobanu, C., Velea, S., Pedagogie digitală, Editura Polirom, Iași, 2025
10. Marin, T., Marin, L.M., Pedagogie. Compendiu, Editura pro Universitaria, București, 2024
11. Pânișoară, I. O, Ghidul profesorului, editura Polirom, Iași, 2017
12. Popovici Borzea, A., Integrarea curriculară și dezvoltarea capacităților cognitive, Editura Polirom, Iași, 2017
13. Repere pentru proiectarea și actualizarea Curriculumului național. Cadru de referință al Curriculumului național, <https://www.educred.ro/resurse-cred/>
14. Strunga, A., Introducere în teoria curriculumului, editura Universitară, București, 2020. <https://www.edu.ro/invatamant-liceal>

10. Evaluare

Tip activitate	10.1 Criterii de evaluare	10.2 Metode de evaluare		10.3 Pondere din nota finală
10.4 Examen/ /Verificare	Completitudinea și corectitudinea cunoștințelor. Coerența logică, fluența, forța de argumentare. Capacitatea de analiză, de interpretare personală, originalitatea, creativitatea. Gradul de asimilare a limbajului de specialitate și capacitatea de comunicare. Capacitatea de a valorifica abilitățile dobândite. Capacitatea de a prelucra datele și problemele enunțate.	- observarea sistematică a studenților (teme individuale/ de echipă - temele trebuie efectuate în săptămâna dintre cursuri, pregătirea unui referat - studiu de caz).		50%
		- test de evaluare formativ (verificări pe parcursul semestrului).		
		- test de evaluare sumativ (verificare finală).	100%	
10.5a Seminar	Capacitatea de aplicare în practică a cunoștințelor învățate. Capacitatea de analiză, de interpretare personală, originalitatea, creativitatea.	- participare activă la activități; - test de evaluare.		50%
10.6 Condiții de promovare				
Rezultatul evaluării finale: nota finală minim 5.				

Data completării: Septembrie 2025

Titular curs:

Lecturer Oana JITARU, Dr

Titular aplicații:

Lecturer Oana JITARU, Dr

Data avizării în departament:
Septembrie 2025

Head of Department,
Associate Professor Gabriel ASANDULUI, PhD

Data avizării în Consiliul Facultății:
Septembrie 2025

Dean,
Professor Andrei BURLACU, PhD

¹Licență/ Masterat.

²1-4 pentru licență, 1-2 pentru masterat.

³1-8 pentru licență, 1-4 pentru masterat.

⁴Examen (E), verificare (V) – din planul de învățământ.

⁵DOB – disciplină obligatorie, DOP – disciplină opțională, DFA – disciplină facultativă;

⁶Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.5, 3.6abc).

⁷Linii de mai jos se referă la studiul individual; totalul se completează la punctul 3.7.

⁸Între 2 și 6 ore. Acestea reprezintă ore didactice și nu se includ în studiul individual.

⁹Suma valorilor de pe liniile anterioare, care se referă la studiul individual.

¹⁰Suma dintre numărul de ore de activitate didactică directă (3.4) și numărul de ore de studiu individual (3.7); trebuie să fie egală cu numărul de credite alocate disciplinei (punctul 3.9) x 25 de ore pe credit.

¹¹Se menționează disciplinele obligatorii a fi promovate anterior sau echivalente.

¹²Tablă, videoproiector, flipchart, materiale didactice specifice etc.

¹³Tehnică de calcul, pachete software, standuri experimentale, etc.

¹⁴Rezultatele învățării prezentate sub formă de cunoștințe, aptitudini, responsabilitate și autonomie specifice disciplinei. Acestea vor fi corelate cu rezultatele învățării pe domenii fundamentale și 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 învățării sunt aferente nivelului 7 din CNC.

¹⁵Titluri de capitole și paragrafe.

¹⁶Discuții, dezbateri, prezentare și/sau analiză de lucrări, rezolvare de exerciții și probleme.

¹⁷Demonstrație practică, exercițiu, experiment.

¹⁸Studiu de caz, demonstrație, exercițiu, analiza erorilor etc.