**ROMÂNIA**

**MINISTERUL EDUCAŢIEI ŞI CERCETĂRII**

**UNIVERSITATEA DIN CRAIOVA**

**FACULTATEA DE AGRONOMIE**

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# PACKAGE OF COURSES

# Bachelor study program:
# LAND SURVEYS AND CADASTRE

This is the package of course of bachelor study program from the Universityof Craiova/the Faculty of Agronomy/
The Department of Land surveys – Management - Mechanization

## 1ST YEAR OF STUDY

### ALGEBRA

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 1 hour of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Understanding how to approach algebra problems
TOPICS: Crowds; Functions; Matrix calculation; Determinants; Vector spaces. Addiction and linear independence; Euclidean spaces. Orthogonal bases; Linear applications. Matrix of linear application; Canonical forms of endomorphism; Biliary forms. Pattern shapes
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, final answers to seminar works 40%
ASSESSMENT TYPE: exam

### APPLIED MATHEMATICS I

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 1 hour of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Understanding students of the basic notions of linear programming and how to approach linear programming problems; Acquiring the notions of analytical geometry.
TOPICS:Linear Programming Elements: Economic problems that lead to linear programming problems; Forms of linear programming problems; Theorems of duality in linear programming; Fundamental theorems of the simplex method; Optimization in transport and distribution; Reduce the transfer problem to a classic transport problem; Balanced transport problem; Adapting the simplex method to the balanced transport problem; Unbalanced transport issues; Straight: forms of the equations of a straight line; Angles and distances in plan; Angle between two planes; Forms of the Equations of a straight in space; The angle between two straight lines in space.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, final answers to seminar works 40%
ASSESSMENT TYPE: verification

### DESCRIPTIVE GEOMETRY I

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: The discipline aims at preparing students for the purpose of learningthe basic notions of descriptive geometry useful forthe subsequent understanding of the concepts of technical drawing.
Descriptive geometry familiarizes students with the notions ofpoint, straight, plan, with their purges in space, as well as withrepresentations of geometric bodies in space, being the basis subsequent subjects such as Technical Drawing.
TOPICS: The point. Sharing space. Purge point. Triple Orthogonal Projection. Particular positions; The straight. Representation of the straight into the purge. The traces of the straight. The particular positions of a straight to the projection planes. Positions relative to two straight lines; The plan. Representing the plan in the purge. Elements

contained in the plan; Determining the plan. Particular straightsof a plan. The relative positions of the two planes. The position of a straight ahead of a plan. Visibility in the process. Intersection of flatfigures; Methods of transforming projections: The method of changing planesprojection. The rotation method. Method
the projection plan defects. Liftingfrom rebate.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 50%, final answers at practical works 50%
ASSESSMENT TYPE: verification

## PROGRAMMING OF CALCULATORS AND PROGRAMMING LANGUAGES

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Knowledge of electronic computing systems and computer programs for the building of databanks, knowledge of the way of elaboration of algorithms for automatic processing of cadastral information of text or numerical type, acquainting students with building different types of tables corresponding to the data banks, working with tables and making tabular calculations
TOPICS: Components of a computing system. Windows operating system. Windows operating system command interpreter. Present command and file commands. Memory management with Windows Explorer. Microsof Word computerized word processing application, menus and work commands. Drawing tables, choosing table properties and sorting them. Tabular calculation. Developing algorithms to solve programming problems. Block schemes. Objects with which algorithms work. Applications in the pseudocode.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 50%, final answers to Laboratory works 50%
ASSESSMENT TYPE: exam

## GEODETIC INSTRUMENTS AND MEASUREMENT METHODS

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: classification of geodetic and topographic equipment; the use of the device; measurement methods used in topography and geodesy.
TOPICS:Introductory notions; Instruments for direct distance measurement; Verification, calibration and comparison of ribbons and roulettes; Direct distance measurement technique; Errors in direct distance measurement; Angle measuring instruments and apparatus: Angle measurement principle; Classification of Angle Meters; Cylinders: component parts, working mode, field operations, precision; Simple goniometers; Theodolite; Parts components; Description of some tachymeters - theodolites; Stacking of theodolites; Angle measurement methods; Indirect measurement of distances; Total stations. Component parts; GNSS receivers; Instruments for measuring level differences; Methods for determining level differences
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, final answers to Laboratory works 40%
ASSESSMENT TYPE: exam

## TECHNICAL DRAWING

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works

NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Using basic knowledge to explain and interpret various types of concepts, situations, processes, projects, etc. associated with the domain; Appropriate use of standard criteria and methods of assessment to assess the quality, merits and limits of processes, programs, projects, concepts, methods and theories; Elaboration of professional projects using the established principles and methods in the field
TOPICS: Technical drawing: Object. Scope. Definitions. Means of execution of technical drawings. Norms, conventions and prescriptions used in the technical drawing. Classification of technical drawings; Geometrical constructions: Construction of perpendicular lines. Construction of parallel straights. Sharing a straight segment. Construction and angle division. Construction of flat geometric figures. Construction of regular polygons. Connections; Representations in the technical drawing: The projective drawing. Projection systems. Representation in orthogonal projection. Layout of the projections in the drawing. Symmetry notions; General rules for drawing up technical drawings: Formats of technical drawings. Folding technical drawings. Lines used in the technical drawing. Writing in the technical drawing. Representation ladders; Representation and designation of construction and construction: Representation of constructive forms in view. Representation of structural forms in the section. Hatching representation. Representation of ruptures. Representation and marking of roughness. Quoting technical drawings. Drawing up technical drawings. Overall drawing. Signs and symbols for schematic representations.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 50%, final answers to Laboratory works 50%
ASSESSMENT TYPE: exam

## ENGLISH LANGUAGE I

CREDITS: 2
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 1 hour of course,
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES:Understanding some written and oral messages in English.Extraction into the relevant formation from a studied material.Identifying attitudes, opinions in an audited message.Initiating and participating in conversations on everyday and professional topics.Clear and fluent, oral and written reporting of real or imaginary encounters, everyday situations, personal experiences.Adapting speech to the particularities of the audience / interlocutor (formal / informal style).Writing messages of different types, notes, letters, reports.Summarizing in writing the information read or heard.Communicate effectively in an engineering environment where a modern language is required.
TOPICS: 1. Focus on language: Present Tense Simple/ Continuous ESP, specific vocabulary: Cadastral survey or cadastral map. 2.Focus on language: Past Tense Simple/ Continuous ESP, specific vocabulary: The production of documents, diagrams, sketches, plans. 3.Focus on language: Present Perfect Simple/ Continuous ESP, specific vocabulary: Track long-term changes over time for geological or ecological studies. 4.Focus on language: Past Perfect Simple/ ContinuousESP, specific vocabulary: Outstanding explorations of design concepts, principles. 5.Focus on language: Means of expressing future ESP, specific vocabulary: Land (economics). 6. Focus on language: -ing formESP, specific vocabulary: The cadastral ID-code.7. Focus on language: Modal verbs IESP, specific vocabulary: Land productivity and assessment database;8. Focus on language: Modal verbs IIESP, specific vocabulary: Mineral resources database. 9. Focus on language: NounsESP, specific vocabulary: Reallotment of units;10. Focus on language: Plural of NounsESP, specific vocabulary: Cadastral data on immovable thing;11. Focus on language: AdjectiveESP, specific vocabulary: Contour or axial lines of engineering structures (linear objects)12. Focus on language: AdverbESP, specific vocabulary: Land area with irrigation equipment: drained land; irrigated land;13. Focus on language: Revision Exercisess ESP, specific vocabulary: The forces that influence land design.
14. Focus on language: Grammar tests ESP, specific vocabulary: The ownership, the tenure, the precise location
TEACHING LANGUAGE: English
KNOWLEDGE ASSESSMENT: answers to to final examinations 60%, ongoing evaluation 40%

ASSESSMENT TYPE: verification

## FRENCH LANGUAGE I

ECTS CREDITS: 2
YEAR / SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 1 hour of course
NUMBER OF WEEKS: 14
TYPE OF COURSE: complementary discipline
COURSE OBJECTIVE(S): Improving the ability to understand spoken French and specific vocabulary texts written in French, using a reference material especially designed for students of Silvicultur e,but also for those who want to learn vocabulary
in context. Practice of important Silviculture vocabulary and grammar practice, tackle four skills, reading, listening, speaking and writing, explain specific vocabulary, and grammar lessons which are thought in detail, with exercises that give students useful practice in this particular area. True or false exercises, gap filling, matching the words with their definition, translations, in context dialogues and lessons with key bolded words are really selected for students to understand and use it correctly.
Deepening the main grammar rules of French in a modern way, problematic, requiring students to learn but also to think.
Consolidation of skills to dialogue, describe, report. Emphasizing the practical nature of learning, the course is ment to stimulate students' interest in written and spoken language, to improve knowledge and communication in French.
COURSE CONTENTS:
Focus on language, Vocabulary: Landscape. Scale and heterogeneity (incorporating composition, structure, and function). Patch and mosaic. Boundary and edge. Ecotones, ecoclines, and ecotopes. Disturbance and fragmentation. Theory. Application. Research directions.
LANGUAGE OF INTRUCTION: French
ASSESSMENT METHOD(S): verification (answers to to final examinations 60%, theoretical and practical checking 40%)

## PHYSICAL EDUCATION AND SPORT I

CREDITS: 1
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 1 hour of seminar,
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES: aims to increase the level of physical training of the future specialist to be master of his body, giving him maximum flexibility and agility.
TOPICS: Presentation of the activity (requirements, samples, control rules). Samples and control rules (initial assessment). Exercises of the front and bands. Action on the spot and on the move. Free exercise for different body segments by overcoming the weight of your body. Free balance exercises: retained positions and crossings from one position to another. Passing from one position to another: lowering the base; increasing the support base by unbalance. Rotation movements of the body around its vertical axis - swings (turns, pirouettes). Exercises for the development of static and dynamic muscle strength. Movements using inertia obtained from an impulse - Balances. Exercises for the development of muscle elasticity and joint mobility. Exercises for developing relaxation. Exercises with balls using different handling techniques - balances, throws and catches, strokes and swings, running on the ground or on different body segments; Spins on the ground and in the air. Exercises for forming the right outfit. Exercises with individual walking stick and pairs. Practical exercises for walking and running. Circuits comprising 4-6 stations, to which are executed driving acts aimed at speed manifestation forms, as well as skill circuits.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: Assessment through practical tests 80%, continuous assessment 20%
ASSESSMENT TYPE: admitted / rejected

## LAND IMPROVEMENT

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge of land resources in terms of their productive capacity and technological characteristics. The Romanian soil taxonomy system - 2003, characterizing the main soil types in Romania and establishing their suitability for different crops and uses.
TOPICS: Definitions and concepts in land grading and land grading. Soil - natural body, fertility. Factors of pedogenesis. Formation and composition of the mineral part and the organic soil part. Horizons and diagnostic properties used in soil classification. Classification and description of Romania's soils. Methodology of pedological studies. Stages of mapping studies. Impairment of agricultural land. Purpose and objectives of bonuses.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

## SOIL MAPPING

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge of land resources in terms of their productive capacity and their technological attributes. The Romanian Soil Taxonomy System - 2003, the characterization of the main soil types in Romania and the determination of their suitability for different cultures and uses.
TOPICS: General notions regarding soil mapping. Pedological studies depending on the scale of the mapping map. Types of pedological studies. Land assessment of agricultural lands. Purpose and objectives of assessment. . Natural and enhanced assessment. Indicators and coefficients used in land assessment. Grouping of lands into suitability classes. Land complexity categories. Importance of land mapping and assessment studies.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

## APPLIED MATHEMATICS II

CREDITS: 5
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Students acquire some notions of trigonometry, vector algebra and applications of vectorial calculations in geometry, spherical trigonometry and astronomy.
TOPICS:Trigonometry elements: trigonometric functions, conditional identities; Methods of Solving Trigonometric Equations and Inquiries; Theorems in any triangle; Applications of trigonometry in geometry; Vector vector algebra: vectors, vector operations, the scalar product of two vectors, the vector product; Applications of vectorial calculus in geometry; Applications of geometry in topography: determinationdistances between inaccessible points and angles between different directions; Extreme geometry problems. Geometric transformations; Spherical trigonometry: relationships and formulas between the elements of a spherical triangle, Gauss formulas, Borda formulas, Neper formulas, Delambre's formulas, Simon L'Huilier's formula; Elements of

astronomy: Celestial bolt, horizontal coordinates, time coordinates, equatorial coordinates, ecliptic coordinates; Coordinate changes; Earth: Precession and nuance of the axis of the world and the celestial poles, the motion of the celestial poles on the Earth's surface, the determination of the longitude difference; Distance measurement methods in astronomy: parallax; Planetary Movements
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, final answers to seminar works 40%
ASSESSMENT TYPE: exam

**APPLIED COMPUTER SCIENCE**

CREDITS: 5
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: The discipline aims at acquiring students in the use of graphic design software, by knowing the AutoCAD application that is used in designing and drawing on a computer.
TOPICS :Presentation of the AutoCAD assisted design application. Initiating new projects with AutoCAD. Launch of orders. Building drawings with AutoCAD.Inserting the coordinates of a drawing. Building elementary objects. Presentation of information orders and graphic aids. Creating and using polylines, splines, blocks and their attributes. Editing commands in AutoCAD. Editing by gripping. Choosing text styles from a drawing. Presentation of graphical screen management methods for viewing a drawing. Building applications in AutoCAD.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 50%, final answers to Laboratory works 50%
ASSESSMENT TYPE: exam

**TOPOGRAPHY I**

CREDITS: 5
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Carrying out specific topographic surveys necessary for the elaboration of topographical, situational, execution and cadastral plans in compliance with the technical norms in the field.
TOPICS: Basic general and topographic notions: The object and definition of the topography. The evolution of the topography. The importance of topography for the economy. Plans and maps: Classification of plans and maps. Content elements of plans and maps. Scale of plans and maps. Using plans and maps. Conventions on measurement units, guidelines and coordinate axes: Errors in Topography: General Terms. Error Classification.The true conventional value. The possibility of errors. Evaluation of accuracy of measurements
Planimetry Elements: Topographic Elements of the Ground. Marking and signaling points. Fix the alignments. The principle of planimetric elevations. Support networks: Local triangulation networks. Preliminary operations. Field operations. Calculations (angular meshing, edge calculation, side orientation, calculus of local triangulation peaks). Triangulation Network Excavation: Intersection Principles. The intersection forward. Reverse intersection (Delambré Process, Hansen Process, Cassini-Martinian Process, Kästner Process, Generalized Intersection Process Back. The side intersection. Linear intersection. Precision of intersections. Errors and tolerances allowed.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 50%, ongoing assessment50%
ASSESSMENT TYPE: exam

**DESCRIPTIVE GEOMETRY II**

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester

HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: The discipline aims at preparing students for the purpose of learningthe basic notions of descriptive geometry useful forthe subsequent understanding of the concepts of technical drawing.
Descriptive geometry familiarizes students with the notions ofpoint, straight, plan, with their purges in space, as well as withrepresentations of geometric bodies in space, being the basis subsequent subjects such as Technical Drawing.
TOPICS: Representation of geometric bodies; Flat sections in polyhedra (with planar planes, with any planes); Flat sections in cylindrical-conical bodies (planar planes, with any planes); Conducting surfaces of geometric bodies. The development of polyhedra. Conducting surfaces of cylindrical-conical bodies; Intersection of geometric bodies. The general method of determining the intersection line.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to to final examinations 50%, final answers at
practical works 50%
ASSESSMENT TYPE: verification

**GEODESY I**

CREDITS: 5
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Design and construction of support networks for topographic elevations, cadastral elevations and other engineering works. Appropriate use in the professional communication of concepts to determine the shape and size of the Earth
TOPICS: The internal and external structure of the Earth. The theory of continent derivation. Reference and coordinate systems. Gravity, centrifugal force, gravity and potentials of this force. Free fall of bodies. The pendulum, the gravitational pendulum. Potential theory (the potential of attraction of simple bodies, harmonic functions, polynomials Legendre developments of gravity potential - in spherical harmonic functions, normal potential, disruptive, potential development in rectangular and spherical coordinates). Level surfaces, power lines. Curvature of level surfaces. Normal gravity. Bruns spheroid. The Clairaut theorem. Variation of normal gravity (on and above the equipotential ellipsoid). Conclusions on the shape and dimensions of the Earth (bodies that approximate the physical Earth). Verticality deviation (interpolation of vertical deviation based on gravity gradient).
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

**ENGLISH LANGUAGE II**

CREDITS: 2
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 1 hour of course, 1hour of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES: Developing and developing the skills needed to use modern language in general and for professional purposes by developing the following skills: linguistic, discursive, strategic and socio-cultural.
TOPICS:1.Focus on language: Infinitive ESP, specific vocabulary: The metes and bounds method 2.Focus on language: ParticipleESP, specific vocabulary: Redistribution, land consolidation3.Focus on language: Gerund ESP, specific vocabulary: Title (property) 4.Focus on language: Grammar tests ESP, specific vocabulary: Boundary dispute and DigitalCadastral DataBase5.Focus on language: Grammar testsESP, specific vocabulary: Land administration6.Focus on language: Grammar tests ESP, specific vocabulary: Surveying7. Focus on language: Grammar testsESP, specific vocabulary: A new

GIS system for the water management administration
TEACHING LANGUAGE: English
KNOWLEDGE ASSESSMENT: answers to to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

## FRENCH LANGUAGE II

ECTS CREDITS: 2
YEAR / SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 1 hours of course
NUMBER OF WEEKS: 14
TYPE OF COURSE: complementary discipline
COURSE OBJECTIVE(S): Improving the ability to understand spoken French and specific vocabulary texts written in French; using a reference material especially designed for students of the Faculty of Agronomy, but also for those who want to learn vocabulary in context. Practice of important Horticulture vocabulary and grammar practice, tackle four skills reading, listening, speaking and writing, explain specific vocabulary, and grammar lessons which are thought in detail, with exercises that give students useful practice in this particular area. True or false exercises, gap filling, matching the words with their definition, translations, in context dialogues and lessons with key bolded words are really selected for students to understand and use it correctly. Deepening the main grammar rules of French in a modern way, problematic, requiring students to learn but also to think. Consolidation of skills to dialogue, describe, report. Emphasizing the practical nature of learning, the course is ment to stimulate students' interest in written and spoken language, to improve knowledge and communication in French.
COURSE CONTENTS:
Topological ecology Organism-centred. Analysis of social-ecological systems using the natural and social sciences and humanities. Ecology guided by cultural meanings of lifeworldly landscapes.
LANGUAGE OF INTRUCTION: French
KNOWLEDGE ASSESSMENT: answers to to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

## PHYSICAL EDUCATION AND SPORT II

CREDITS: 1
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 1 hour of seminar,
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES: aims to increase the level of physical training of the future specialist to be master of his body, giving him maximum flexibility and agility.
TOPICS: Presentation of the activity (requirements, samples, control rules). Samples and control rules (initial assessment). Exercises of the front and bands. Action on the spot and on the move. Free exercise for different body segments by overcoming the weight of your body. Free balance exercises: retained positions and crossings from one position to another. Passing from one position to another: lowering the base; increasing the support base by unbalance. Rotation movements of the body around its vertical axis - swings (turns, pirouettes). Exercises for the development of static and dynamic muscle strength. Movements using inertia obtained from an impulse - Balances. Exercises for the development of muscle elasticity and joint mobility. Exercises for developing relaxation. Exercises with balls using different handling techniques - balances, throws and catches, strokes and swings, running on the ground or on different body segments; Spins on the ground and in the air. Exercises for forming the right outfit. Exercises with individual walking stick and pairs. Practical exercises for walking and running. Circuits comprising 4-6 stations, to which are executed driving acts aimed at speed manifestation forms, as well as skill circuits.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: Assessment through practical tests 80%, continuous assessment 20%

ASSESSMENT TYPE: admitted / rejected

## ENVIRONMENT PROTECTION

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES: Awareness of the rational use of the soil as it is inextensible is the physical support for life and its activities. An important role is to protect it in order to maintain its natural fertility.
TOPICS: Soil erosion. Forms of erosion. Consequences of the erosion process. Anti-erosion agrotechnics. Soil pollution. Prevention of soil pollution. Physical methods of soil polluting. Chemical Soil Deposition Methods.Thermal Soil Deposition Methods.Biological methods of soil decontamination. Specific legislation on soil protection.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

## GENERAL ECONOMY

CREDITS: 4
YEAR/SEMESTER: I$^{st}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES: Knowledge of the notion of economic structure, property, capital, human resource, investment, etc. Understanding how to organize market-specific activities
TOPICS: The economic activity: 1.1. Components of the national economy, 1.2. The structure of the national economy1.3. Economic agents and enterprise1.4. Business Activity Indicators; 2. Types of economy:2.1. Natural economy2.2. Market economy 2.3. The features of the market economy 2.4. Market functions; Production factors and their use; Exchange and exchange mechanism; Demand and supply; Competition; Price; Monetary and financial market; Salary and profit; Interest and rent; Income, consumption, investments; Balance and economic imbalances.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to to final examinations 60%, essay40%
ASSESSMENT TYPE: verification

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# 2$^{ND}$ YEAR OF STUDY

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## GEODESY II

CREDITS: 4 exam, 3 project
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of project
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Design and construction of support networks for topographic elevations, cadastral elevations and other engineering works. Appropriate use in the professional communication of concepts to determine the shape and size of the Earth
TOPICS: Geodetic and positioning date (date definition, multiple datum problems, positioning). Performing horizontal angular observations in geodetic networks (complete series method, Schreiber method. Processing of measurements made in planimetric geodetic networks, using the indirect observation method. Geodetic network

frames (altimetric, planimetric, three-dimensional). Geodetic geometric level. Geodetic trigonometric level. Vertical date (fundamental zero point), Altitude systems (ellipsoidal altitudes, geopotential number, dynamic system, spherical orthometric, normal). Free geodetic networks (general case, degree of freedom, generalized inverse, processing methods: S transformation, Hansen-Helmert-Wolf method, Mittermayer method, Factoring by rank).
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%, project 100%
ASSESSMENT TYPE: exam, project

## TOPOGRAPHY II

CREDITS: 5
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowing how the triangulation points are transmitted to the ground. Know how to realize the planimetric routing networks; Knowing the specific methods of lifting the planimetric details;
TOPICS: Transmitting triangulation points to the ground. Transcalculate coordinates. Planimetric lift networks. Planimetric traverses. Planimetric elevation of topographic details.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 50%, ongoing assessment50%
ASSESSMENT TYPE: exam

## CADASTRE I

CREDITS: 4
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Theoretical and practical training of students in order to acquire the knowledge and methods for obtaining technical documents of the general cadastre.
TOPICS: Introductory general notions. Short history. Definition, characteristics, role, purpose, importance, functions. Cadastre institutions. Role, attributions. Types of cadastre. Administrative-territorial division of Romania.Basic units in cadastre. Cadastral delimitation of administrative-territorial. General Provisions.Delimitation operations. Delimitation of intravilanes. The dossier of the territorial administrative unit delimitation. Land categories. Usage of landCategories of land use. General cadastre introduction works. Overall technical project. Technical project execution. Cadastre works by using plans and old maps. General cadastral work on orthophotomaps. Graphics database. Content of the basic cadastral plan. Accuracy. Content of the overall cadastral plan. Methods of obtaining cadastral plans. Accuracy.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## CARTOGRPHY

CREDITS: 5
COURSE COORDINATOR:
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Explaining and interpreting some terms in the field of geodesy, cartography discipline by reasoned use of the fundamental principles of mathematics, physics, topography, computer science.
TOPICS:1. Definition of mapping, branches, object, methods, connection with other sciences, importance of cartography and short history;2. Formulas and notions used in cartography;3.

Cartography-map, plan, atlases, elements of plans and maps;4. Mathematical mapping - mathematical elements of the Earth's ellipsoid, general notions of projections;5. Mathematical mapping - Classification of cartographic projections;6. Drawing up maps - the classic methods of drawing up. 7. Drawing up of maps - general mapping methods, planimetry elements and leveling / representation of the relief;8. Drawing up maps - methods of mapping on special maps.9. Map drawing - cartographic representation methods, use phildigit and Philcarto, Cartes etDonnées, GIS open sources, Quantum GIS / gvSIG;10. Map Making - Methods Modern Mapping Methods: Webmapping;11. Mapping and Geographic Information Systems, from ancient maps to Google Earth and WorldWind (NASA);12. Cartoreproduction - classic and digital map editing methods;13. Cartometry - surveys on topographic maps
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## PHYSICS I

CREDITS: 4
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Knowledge of notions, concepts, laws and specific principlesphysics. Knowledge of methods, techniques of investigation and exploration ofliving systems.
TOPICS: Introduction in physics. Physical characters specific to biofysics. Atomic and nuclear physics. Direct sunlight. Broadcast Radiation. Reflection capacity. Terrestrial and terrestrial radioactivity. Atmospheric radiation. Actual radiation. Greenhouse effect. Surface radiation. Radiation balance of the atmosphere.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## ENGLISH LANGUAGE III

CREDITS: 2
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 1 hour of course,
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES:Understanding some written and oral messages in English.Extraction into the relevant formation from a studied material.Identifying attitudes, opinions in an audited message.Initiating and participating in conversations on everyday and professional topics.Clear and fluent, oral and written reporting of real or imaginary encounters, everyday situations, personal experiences.Adapting speech to the particularities of the audience / interlocutor (formal / informal style).Writing messages of different types, notes, letters, reports.Summarizing in writing the information read or heard.Communicate effectively in an engineering environment where a modern language is required.
TOPICS: 1.Focus on language: Present Tense Simple/ Continuous ESP, specific vocabulary: Cadastral survey or cadastral map. 2.Focus on language: Past Tense Simple/ Continuous ESP, specific vocabulary: The production of documents, diagrams, sketches, plans. 3.Focus on language: Present Perfect Simple/ Continuous ESP, specific vocabulary: Track long-term changes over time for geological or ecological studies. 4.Focus on language: Past Perfect Simple/ ContinuousESP, specific vocabulary: Outstanding explorations of design concepts, principles. 5.Focus on language: Means of expressing future ESP, specific vocabulary: Land (economics). 6. Focus on language: -ing formESP, specific vocabulary: The cadastral ID-code.7. Focus on language: Modal verbs IESP, specific vocabulary: Land productivity and assessment database;8. Focus on language: Modal verbs IIESP, specific vocabulary: Mineral resources database. 9. Focus on language: NounsESP, specific vocabulary: Reallotment of units;10. Focus on language: Plural of NounsESP, specific vocabulary: Cadastral data on immovable thing;11. Focus on language: AdjectiveESP, specific vocabulary:

Contour or axial lines of engineering structures (linear objects)12. Focus on language: AdverbESP, specific vocabulary: Land area with irrigation equipment: drained land; irrigated land;13. Focus on language: Revision Exercisess ESP, specific vocabulary: The forces that influence land design.
14. Focus on language: Grammar tests ESP, specific vocabulary: The ownership, the tenure, the precise location
TEACHING LANGUAGE: English
KNOWLEDGE ASSESSMENT: answers to to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

## FRENCH LANGUAGE III

ECTS CREDITS: 2
YEAR / SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 1 hour of course
NUMBER OF WEEKS: 14
TYPE OF COURSE: complementary discipline
COURSE OBJECTIVE(S): Improving the ability to understand spoken French and specific vocabulary texts written in French, using a reference material especially designed for students of Silvicultur e,but also for those who want to learn vocabulary
in context. Practice of important Silviculture vocabulary and grammar practice, tackle four skills, reading, listening, speaking and writing, explain specific vocabulary, and grammar lessons which are thought in detail, with exercises that give students useful practice in this particular area. True or false exercises, gap filling, matching the words with their definition, translations, in context dialogues and lessons with key bolded words are really selected for students to understand and use it correctly.
Deepening the main grammar rules of French in a modern way, problematic, requiring students to learn but also to think.
Consolidation of skills to dialogue, describe, report. Emphasizing the practical nature of learning, the course is ment to stimulate students' interest in written and spoken language, to improve knowledge and communication in French.
COURSE CONTENTS:
Focus on language, Vocabulary: Landscape. Scale and heterogeneity (incorporating composition, structure, and function). Patch and mosaic. Boundary and edge. Ecotones, ecoclines, and ecotopes. Disturbance and fragmentation. Theory. Application. Research directions.
LANGUAGE OF INTRUCTION: French
ASSESSMENT METHOD(S): verification (answers to to final examinations 60%, theoretical and practical checking 40%)

## INFORMATION SYSTEMS IN GEODESY

CREDITS: 3
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Have general knowledge about Information Systems, data flow, and spatial analysis. To use GIS software, to acquire geodetic data, integrate and verify them, spatial analysis. Integrate and analyze geodetic data using GIS software. Capture, update and integrate geodetic data using GIS in accordance with information technology requirements.
TOPICS:1. Introduction to GIS.2. Map (analog map and digital map).3. Accuracy of digital data.4. GIS applications.5. Geo-relational data model.6. Platforms used by GIS.7. Getting databases.8. Projection transformations.9. Implementation of geographic information systems.10. Acquisition of data.11. The stages of realization of the specific information system. Real estate in localities - intravilan.12. Valorisation of topographical measurements.13. Geo-spatial data.14. GIS between benefits and risks.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: exam: answers to final examinations 60%, ongoing assessment 40%

ASSESSMENT TYPE: exam

## PHYSICAL EDUCATION III

CREDITS: 1
YEAR/SEMESTER: II$^{nd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 1 hour practical course
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVE(S): Discipline aims at forming the theoretical, practical and methodical skills for individual or group practice for a healthy lifestyle; Awareness of students about the role and importance of practicing physical exercise.
COURSE
CONTENTS: Gymnastics: Front and Band Exercises; Gymnastics Aerobics / Fitness; Application trails combined with treadmills; Application paths combined with equilibrium, escalation, climbing exercises; Sports games: basketball; Sports game: football; Bilateral games under similar competition conditions.
LANGUAGE OF INTRUCTION: Romanian
ASSESSMENT METHOD(S): A/R (Assessment through practical tests 80%, continuous assessment throughout semester 20%)

## CIVIL BUILDINGS

CREDITS: 3
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES:It refers to the knowledge, understanding and acquisition of the aspects related to: - the notions of the construction technique; - construction stages: - building materials, - building physics elements; - dimensioning of the infrastructure and superstructure elements; - on-site application of civil and industrial construction projects, communication and artworks, hydro-technical constructions and land improvements; - the description of the project as a whole, specifying the topographical elements necessary for plotting it on the ground.
TOPICS: Concepts of construction techniques and construction stages. Building Materials.Elements of building physics. Construction infrastructure. Construction superstructure. Calculation of Resistance Elements.Structural strength structures. Non-structural elements and finishing in construction. Installations and specific elements of construction technology.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## TOPOGRAPHY III

CREDITS: 4
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Presentation of the methods of thickening the projected support networks. Presentation of the digital model of a macro surface. Presentation and argumentation of the chosen solutions for designing a geodetic network to track the behavior of a dam by reporting to the quality, safety and security standards. Presentation of the final results obtained after the spatial geodesic network processing - the precision.
TOPICS: Leveling elevations; General level and definition definitions; Classification of the level; Leveling support networks; Geometric level; geometrical leveling tools; Leveling devices; Determination of level differences through geometric leveling and geometric leveling types; Geometric end cap; . Geometric middle plane;

Methods of geometric leveling, Closed leveling; Supported leveling of the drummers; Double leveling; the leveling with the nodal point; the leveling; the leveling combined with the leveling; Level crossing combined with transverse alignments (transverse profiles); Trigonometric level; Surface level; Representation of the relief.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 50%, ongoing assessment 50%
ASSESSMENT TYPE: exam

**CADASTRE II**

CREDITS: 2 exam, 2 project
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of project
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge of the land stock and the need for its rational use; Explaining the ways of field research on real estate; Preparation of cadastral form and registry according to the legal situation; Creating with sense of responsibility the observance of the legislation of all cadastral documents.
TOPICS: Conventional signs and writing rules in cadastral plans; Reconstruction of cadastral plans. Land registration of cadastral data. Technical project of rebuilding works; Rebuilding methods; Cadastral numbering; Calculation of surfaces; Correction of boundaries; Cadastral registers; Control, approval and reception of cadastral works; Detachment and plots; Forms of property existing today in Romania; Real estate advertising; Land Registry. Definition and parts; Real estate rights.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%, project 100%
ASSESSMENT TYPE: exam, project

**SPECIAL MATHEMATICS**

CREDITS: 4
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 1 hour of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Assimilating ways to approach mathematical models through the theory of dynamic systems.
TOPICS: Functions of several variables: function limits, continuity; Partial derivatives, differentiability; Gradient, Taylor's formula for several functions; Extreme for more variable functions; Full calculation: double integer; Triple Integral; Surface integrals; Elements of Field Theory; Differential equations: fundamental notions, solutions, initial conditions, differential equations of the first order; Equations with separable variables. Orthogonal trajectories; Homogeneous equations. Linear equations. Bernoulli's equations; Exact total differential equations. Factor integrant; Lagrange and Clairaut's equations; Systems of differential equations.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

**COMPENSATION OF MEASUREMENTS**

CREDITS: 3
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: The way to process measured data to get the most probable values. The ability to detect errors before processing, the ability to calculate the accuracy of the determinations.
TOPICS: Classification of measurement errors. Basic notions of probability theory and statistics.

Processing of direct measurements. Processing of Indirect Measurements.Correction equations. Normal equations. Estimation of accuracy. Processing of geodetic measurements in planimetric networks. The variation of the pitch depends on the variation of the x and y coordinates. The variation of the distance D according to the variation of the x and y coordinates. Calculating error ellipse. Processing conditional measurements. Examples of using statistics for geodetic measurements.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 50%, ongoing assessment 50%
ASSESSMENT TYPE: verification

## ELIPSOIDAL GEODETICS

CREDITS: 4
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Design and construction of support networks for topographic elevations, cadastral elevations and other engineering works.
TOPICS: Introduction. Earth Figure (topography, sphere, ellipsoid, geoid, relative position of the geoid, ellipsoid and terrestrial surface, reference ellipsoid). Coordinate systems (rectangular, spherical, surveying). The rotation ellipsoid (parameters, parametric equations, main curve radii). Determination of rotation ellipsoid parameters from parallel and meridian arc measurements. Curves on the surface of the rotation ellipsoid (the linear element of a curve, the angle formed by the coordinate lines, the element of the array, the azimuth of a curve). Curvature curves. The Meusnier theorem. The radius of curvature of a normal section. Average Gauss radius. Normal cross sections. Geodetic line (differential equations, Clairaut equations, parametric equations, Puiseaux-Weingarten-Gauss transformations). Problems solved on the rotation ellipsoid (spherical excess of a small ellipsoid triangle, solving small ellipsoidal triangles, direct and reverse geodetic problem, differential formulas). Reduce horizontal angular observations to the reference surface.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## DOMAIN PRACTICE

CREDITS: 4
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 90 hours of practice at the end of II$^{nd}$ Semester
NUMBER OF WEEKS: 3
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Practical training of students in order to acquaint and acquire the methods specific to: topography; geodesy; surveying; GPS; photogrammetry; automation of topo-geodesic works. Knowledge of the measuring equipment specific to geodetic works of planimetry and levelment.
TOPICS:1. Topographic points, marking and signaling points. 2. Benchmarking works. 3. Instruments for direct measurement of distances. 4. Topographical operations with panglica and poles. 5. Istruments and apparatus for measuring angles. 6. Angle measurements. 7. Indirect measurement of distances. 8. Using plans and halls. 9.Local triangulation relationships. 10.Description of triangular networks. 11. Planimetrical guidelines. 12. Planimetric reduction of topographic details. 13. Geometric and trigonomerical living. 14. Geometric level instruments. 15. Geometric leveling traverses.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## PHYSICS II

CREDITS: 3
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 1 hour of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: fundamental discipline
COURSE OBJECTIVES: Knowledge and understanding of the main notions of modern physics structured on chapters: electrodynamics and electromagnetic waves, modern optics, spectroscopy and lasers, solid physics. Knowledge of modern notions of optics, physics of dielectric materials, different optical and optoelectronic devices and instruments with their main characteristics. Explanation, understanding and interpretation of the main theoretical and practical notions of the subject. Formation of technical and applicative skills for the use of laboratory apparatus and devices. Interpretation and processing of experimental data using the computer;
TOPICS: Electrodynamics, electromagnetic waves, Maxwell's equations, dual nature, spectral classification. The main phenomena resulting from the wave-like wavelength: light dispersion and absorption, light polarization and applications, light interference and interference devices, light diffraction and diffraction. Photonic optics, photoelectric effect, Compton effect, radiation laws. Consistent optics and lasers, construction principles, different types of lasers, their use. Nonlinear optics. Optical fibers, description, properties, their use. Different types of materials and their properties: solid and semiconductor, dielectric and ferroelectric, superconductivity. Superconducting materials, applications of superconductivity, Optoelectronic devices. Plasma physics, some applications of plasma obtained by electrical discharge into gases.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## ENGLISH LANGUAGE IV

CREDITS: 2
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 1 hour of course, 1hour of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVES: Developing and developing the skills needed to use modern language in general and for professional purposes by developing the following skills: linguistic, discursive, strategic and socio-cultural.
TOPICS:1.Focus on language: Infinitive ESP, specific vocabulary: The metes and bounds method 2.Focus on language: ParticipleESP, specific vocabulary: Redistribution, land consolidation3.Focus on language: Gerund ESP, specific vocabulary: Title (property) 4.Focus on language: Grammar tests ESP, specific vocabulary: Boundary dispute and DigitalCadastral DataBase5.Focus on language: Grammar testsESP, specific vocabulary: Land administration6.Focus on language: Grammar tests ESP, specific vocabulary: Surveying7. Focus on language: Grammar testsESP, specific vocabulary: A new GIS system for the water management administration
TEACHING LANGUAGE: English
KNOWLEDGE ASSESSMENT: answers to to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

## FRENCH LANGUAGE IV

ECTS CREDITS: 2
YEAR / SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 1 hours of course
NUMBER OF WEEKS: 14
TYPE OF COURSE: complementary discipline
COURSE OBJECTIVE(S): Improving the ability to understand spoken French and specific vocabulary texts written in French; using a reference material especially designed for students of the

Faculty of Agronomy, but also for those who want to learn vocabulary
in context. Practice of important Horticulture vocabulary and grammar practice, tackle four
skills reading, listening, speaking and writing, explain specific vocabulary, and grammar lessons which are thought in detail, with exercises that give students useful practice in this particular area. True or false exercises, gap filling, matching the words with their definition, translations, in context dialogues and lessons with key bolded words are really selected for students to understand and use it correctly.
Deepening the main grammar rules of French in a modern way, problematic, requiring students to learn but also to think. Consolidation of skills to dialogue, describe, report. Emphasizing the practical nature of learning, the course is ment to stimulate students' interest in written and spoken language, to improve knowledge and communication in French.
COURSE CONTENTS:
Topological ecology Organism-centred. Analysis of social-ecological systems using the natural and social sciences and humanities. Ecology guided by cultural meanings of lifeworldly landscapes.
LANGUAGE OF INTRUCTION: French
KNOWLEDGE ASSESSMENT: answers to to final examinations 60%, ongoing evaluation 40%
ASSESSMENT TYPE: verification

**PHYSICAL EDUCATION IV**

CREDITS: 1
YEAR/SEMESTER: II$^{nd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 1hour practical course
NUMBER OF WEEKS: 14
COURSE TYPE: complementary discipline
COURSE OBJECTIVE(S): Discipline aims at forming the theoretical, practical and methodical skills for individual or group practice for a healthy lifestyle; Awareness of students about the role and importance of practicing physical exercise.
COURSE CONTENTS:
Gymnastics: Front and Band Exercises; Gymnastics Aerobics / Fitness; Application trails combined with treadmills; Application paths combined with equilibrium, escalation, climbing exercises; Sports games: basketball; Sports game: football; Bilateral games under similar competition conditions.
LANGUAGE OF INTRUCTION: Romanian
ASSESSMENT METHOD(S): A/R (Assessment through practical tests 80%, continuous assessment throughout semester 20%)

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## 3$^{RD}$ YEAR OF STUDY

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**INFORMATION SYSTEMS IN CADASTRE**

CREDITS: 4
YEAR/SEMESTER: III$^{rd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Theoretical and practical training of students in acquiring the knowledge and methods related to the introduction of specialized cadastres.
TOPICS: Cadastre of the agricultural fund. Cadastre of the real estate fund. Water cadastre.Cadastre of the forest fund. Cadastre of land with special destination. Industrial cadastres.

TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

**GEODESIC GRAVIMETRY**

CREDITS: 5
YEAR/SEMESTER: III$^{rd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Design and construction of support networks for topographic surveys, cadastral elevations and other engineering works.
TOPICS: Definitions. Historic.Link to other disciplines. Geodetic gravity. Gravity. Centrifugal force gravity; Potential of gravity field. Level surfaces. Lines of force. Subject of gravimetric determinations. Reductions and anomalies of the gravity field. Anomaly (reduction) in the open air (Faye); intermediate layer reduction; Relief reduction. Reduce Bouguer; Vertical deviations. Geoid corrugations. Astronomy-geodetic determination of the vertical deviation; Reduction of astronomical-geodetic measurements on conventional surfaces. Modern methods of geoid determination.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

**SPACE GEODESY TECHNOLOGIES**

CREDITS: 5
YEAR/SEMESTER: III$^{rd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of project
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Appropriate use in the professional communication of global positioning concepts. Argumental use of mathematics, physics and specialty concepts, principles and techniques for explaining and interpreting GPS positioning issues. Acquiring skills to interpret measured data using GPS technology. Using computational programs for data processing measured with GPS technology. Assessment of the quality of some methods and procedures in the field of geodetic engineering regarding GPS positioning.
TOPICS: Overview of GPS. The principle of positioning in the GPS system. The main errors in GPS positioning. Coordinate systems used in GPS technology.GPS measurement methods. Planning and preparing a GPS campaign.GPS receivers. Geodetic networks created by GPS measurements. Coordinate systems used in satellite geodesy. Processing of GPS observations. Romanian Positioning System ROMPOS.European EUREF Reference System.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

**NATIONAL AND LOCAL GEODETIC NETWORKS**

CREDITS: 4
YEAR/SEMESTER: III$^{rd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Design and construction of support networks for topographic elevations, cadastral elevations and other engineering works.
TOPICS: Introduction. Basic knowledge of national and local networks. Coordinate systems (rectangular, spherical, geodetic) used in national and local networks
Elaboration of the project of national and local geodetic networks of triangulation-trilateration,

leveling, gravimetric and determined with GNSS technology.The materialization of the points of the national and local geodetic network of traing-trilateration, leveling, gravimetry and determined by GNSS technology.The optimal form of network development for a triangulation base of the national and local networks.Optimization of the national and local geodetic network of triagulation-trilateration.The use of GNSS technology to optimize the triangulation network and the beneficial contribution of this technology.Geometry of the triangulation-trilatelation network using the new GNSS technology.Optimization of the national and local geodetic network through trilateration, triangulation and GNSS.Comparative study on geodetic network optimization through trilateration, triangulation and GNSS technology in various combinations.Project overloading a national and local geodetic network of triangulation-trilatelation, GNSS and of leveling and gravimetry.Geodesic Earth Observation Network project taking into account GNSS space technology.Compensation of national and local networks by indirect measurement method and determination of the accuracy of their determination.Compensation of national and local networks by means of conditional measurements and determination of the precision of their determination.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## ORGANIZATION OF TERRITORY AND ECOLOGY I

CREDITS: 4
YEAR/SEMESTER: III$^{rd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge, understanding of the concepts, theories and basic methods of the domain and of the specialization area; their proper use in professional communication.
TOPICS: Organization, land / land / geographic spatial planning. The rural area. General problems in the organization and arrangement of the territory. Regionalization as a way of organizing the territory. Sustainable development and development of the territory. Land Fund of Romania. Land cadastre and land organization. Romanian rural space.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## GEODETIC ASTRONOMY

CREDITS: 5
YEAR/SEMESTER: III$^{rd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Appropriate use in the professional communication of concepts to determine the shape and size of the Earth.Explaining and interpreting geodetic engineering issues by using well-grounded techniques, concepts and fundamental principles of mathematics, physics as well as those of specialty in astronomy, topography, geodesy, photogrammetry, remote sensing, cadastre.
TOPICS: Spherical trigonometry. Introduction to Geodesic Astronomy. The infinite universe
Solar system. Earth Revolutionary Movement.The rotation movement of the Earth around its axis (Diurnal Movement). Celestial sphere and apparent daytime motion of the celestial sphere The apparent daytime and annual movement of the Sun. Astronomy coordinate systems. Celestial reference systems. Astronomical phenomena. Time and time measurements.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## ELEMENTS OF ARCHITECTURE AND LANDSCAPING

CREDITS: 3
YEAR/SEMESTER: III$^{rd}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: It is directly related to ensuring the environmental balance of the environment, the landscape architecture is concerned with the preservation and development of landscapes and associated values, for the benefit of current and future generations. Forests and free-range areas have an essential ecological role: they produce the oxygen necessary for life, reduce the physical, chemical and microbial pollution of the atmosphere, create a favorable microclimate, provide shelter to birds and other living creatures and, where appropriate, protect flora, soil, improves and capitalizes degraded lands.
TOPICS:Introduction; Relationships of trees and ornamental shrubs with the factors of the environment; Relations with climatic factors: edatical factors, orographic factors, urban environment factors; Zoning of ornamental wood species; Multiplication of ornamental wood species, dendrological nursery; Production of sexually and vegetatively propagating material; The importance and role of green spaces.The evolution of landscape architecture.The importance and role of green spaces, their distribution and their systematization.General principles of composition of parks and gardens.Constructive elements of green spaces.The roads in parks and gardens. Draw roads and alleys. Vegetation and its components. Designing green spaces. Establishing their green spaces.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## SATELLITE GEODESY

CREDITS: 2 exam, 2 project
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of project
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Appropriate use in the professional communication of satellite geodetic concepts. The use of the fundamental concepts, principles and techniques in mathematics, physics and specialty to explain and interpret some problems in the field of satellite geodesy.
TOPICS: Getting Started in geodesy with satellites. Orbit and orbital motion of satellites. Satellite signals. Electromagnetic waves and their propagation into the atmosphere. Doppler effect. Generation and structure of satellite signals. Content and Structure of GPS Signals. Receiving satellite signals. Technique for receiving satellite signals. Processing of satellite signals. Coordinate systems used in satellite geodesy. Coordinate transformations in satellite geodesy. Reference systems used in Satellite Geodesy. Time systems used in Satellite Geodesy. Methods of measurement and determination of point positions. Types of observations used in Spatial Geodesy. Using GNSS systems (GPS, GLONASS, GALILEO) in Geodesy. Interpretation and transformation of satellite observations results. GNSS networks and integration possibilities with classical networks (terrestrial).
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%, project 100%
ASSESSMENT TYPE: exam, project

## CARTOGRAPHIC PROJECTIONS

CREDITS: 4
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge, understanding of the concepts, theories and basic methods of the field

and of the specialization area: Knowing the terms used in CARTOGRAPHY and understanding their relationships; Knowing the methods used in CARTOGRAPHY; Explaining the calculation formulas and interpreting the results; The formation of skills for map-based scientific research and the ground-map relationship.
TOPICS: Azimuth projections, classification and description of azimuth projections; Stereographic projection 1930, stereographic projection 1970; Cylindrical projections, classification;
Straight cylindrical projections. Mercator projection; Oblique and transverse cylindrical projections;
GAUSS-KRUGER projection, geometrical elements, deformations; Coordinate transformations in the Gauss-Kruger projection, meridian convergence angle, reduction of direction and distances to the projection plan; UTM projection, geometrical elements, deformations; Nomenclature of maps in the TUM projection; Conical projections; Conventional projections and derived projections.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

**ORGANIZATION OF TERRITORY AND ECOLOGY II**

CREDITS: 4
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of project
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Using basic knowledge to explain and interpret various types of concepts, situations, processes, projects, etc. associated with the domain. Appropriate use of standard criteria and methods of assessment to assess the quality, merits and limits of processes, programs, projects, concepts, methods and theories. Developing professional projects with the use of established principles and methods in the field.
TOPICS: Organizing the Romanian geographic space. Organizing and arranging agricultural land. Organizing and arranging green space. Hydraulic engineering.
Transport arrangements. Organization and spatial planning of the territory. Organization and arrangement of tourist space.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

**CARTOGRAPHIC DRAWING**

CREDITS: 3
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge, understanding of the concepts, theories and basic methods of the domain and of the specialization area; their proper use in professional communication.
TOPICS: Carried out the cartographic drawing. Cartographic projection systems. Representation of the land surface. Using computers to represent cartographic information. Map orientation. Study maps. Maps map operations. Analysis and interpretation of maps. Maps and digital mapping. Geographic and Territorial Information Systems used to manage Urban-Rural resources. Using maps to represent geographic features. Drawing and editing techniques with AutoCAD.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## ENGINEERING MEASUREMENT

CREDITS: 4
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: the use of topographic devices; Drawing of connection curves; topographical measurements made for land improvement works; drawing works for the reservoir lake; Measurement of level differences and calculation of points quotas; drawing up the quoted plans and drawing the level curves;
Making longitudinal and transversal profiles for land improvement works; drawing terraces and leveling the surfaces; plotting of characteristic building points; tracing and execution of civil, industrial and agricultural constructions; tracking the route of a communication route on the ground; drawing and opening of the lines in the forest; tracking bridges and viaducts on the ground.
TOPICS:1. The object and definition of engineering topography.2. Planimetric and multiple cutting networks.3. Spatial support networks for transportation of engineering constructions and works. 4. Topographic preparation of projects for engineering and construction works - establishing the necessary documentation. 5. Topographic preparation of projects for engineering and construction works. 6. Tracking simple topographic elements.7. The use of engineering topography in the design, execution and exploitation of engineering and construction works. 8. Cutting curves. 9. Methods for tracking and pichetation of intermediate points of circular curves. 10. Topographic measurements and plans following designing functional improvement works and technical-edilitary networks. 11. Water levelling. 12. The main topographic measurements carried out at the transit of functional, engineering and construction works. 13.Gabaritation of deble and ramble. Storage of recovery, design and irigation works. Transportation of the terraces and roads of loads. Transportation of way loads. Topography of construction methods of planning in the plan of characteristics of construction. Method of polar coordination. Method of rectangular coordination. The method of pregnancy inconsection. Repeated intersection method. Topographical works concerning the transposition and execution of civil, industrial and agricultural constructions. Transmission of proposed floors and foundations. Determination of the heat of constructions. Road tracking of the route of a communication route. Floor transportation of floors and floor projects. Trace and opening lines in the weaknesses. Measurement and analysis of knowledge. Measurement and analysis of horizontal leaves and land areas.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 50%, ongoing assessment 50%
ASSESSMENT TYPE: exam

## PHOTOGRAMMETRY I

CREDITS: 3
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 1 hour of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge, understanding of the concepts, theories and basic methods of the field and of the specialization area: knowing the terms used in photogrammetry and understanding the relationships between them; knowledge of instruments used in photogrammetry; explaining the formulas and interpreting the results.
TOPICS:Introduction (definition, purpose and development of photogrammetry).Terms and terms used in photogrammetry.Optics used in photogrammetry; Characteristics and constant of the objective;Aberrations of Objectives; shutter; Diaphragm; Light filters.Photochemical process in photographic techniques; Photographic emulsion; Preparation of photographic emulsions; Structure of silver bromide crystals; The chemical nature of the latent image; Spectral sensitization of photographic emulsions.Photographic processing of black and white photographic materials; Photographic processing of color photographic materials; Photographic materials; The physical properties of the image developed.Aerofotografierea; Air photography; Technical conditions to be met by aerofootogrammetric airplanes; Airplane types; Technical specifications.Aerofotogrammetric

chambers; Technical conditions to be met by aerofootogrammetric chambers; Criteria ofPhotogrammetric camera attachments; Verification and calibration of aerofotogrammetric chambers; Calibration methods.Aerophotography project; Meteorological and optical-atmospheric conditions of aerophotography; Selection of films and filters for aerial photography.Calculations required for the aerophotography project; Calculation of heights; Calculation of photogram coverage.Calculating the number of bands and the number of photograms; Calculation of band inputs; Calculation of fuel consumption.Laboratory processing of aerial photography results; Conditions to be met by aerial photography.Verification of aerial photography results; Overall assessment of the quality of aerial photography results.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

**ETHICS AND ACADEMIC INTEGRITY**

ECTS CREDITS: 1
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 1 hour of course
NUMBER OF WEEKS: 14
TYPE OF COURSE: complementary discipline
COURSE OBJECTIVE(S): presenting and explaining the concepts and defining elements of ethics and academic integrity through a quantitative and qualitative analysis of the phenomena specific to this discipline; initiating students in the field of ethics and academic integrity; quantitative and qualitative analysis of phenomena specific to ethics and academic integrity; integrating knowledge acquired in other disciplines in the training system of this master's degree in the development of individual reports and case studies.
COURSE CONTENTS: The legislative framework and ethical standards applicable to professional ethics specific to the academic environment and good conduct in scientific research; Plagiarism, self-plagiarism and other deviations from the norms of good conduct in scientific research, technological development and innovation; Ethics in the teaching process in academia. Ethics in research; conflict of interest. Code of Honor of academic integrity. Instruments of judicial governance of students. Incidents of racial and sexual harassment; Corruption – concept, prevention, fight; The hidden cost of favors - conflict of interest; Transparency – a panacea? Ethical careers; whistleblowers vs. ethics counselors; Professional codes of ethics; Errors, mistakes and sanctions; Ethical issues of teaching one's own discipline; Ethical problems between colleagues, Ethical issues related to money; Confidentiality, Relationship with the client; Code of Ethics and Professional Dentistry of the UCV.
LANGUAGE OF INTRUCTION: Romanian
ASSESSMENT METHOD(S): final examination (answers to exam 60%, evaluation during the semester 40%).
ASSESSMENT TYPE: verification

**SPECIALTY PRACTICE**

CREDITS: 4
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 90 hours of practice at the end of II$^{nd}$ Semester
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Practical training of students in order to acquaint and acquire the methods specific to: topography; geodesy; surveying; GPS; photogrammetry; automation of topo-geodesic works.
TOPICS:1. Trigonometric traverses. 2. Shift directions (horizontal angles). 3. Trimming the directions (horizontal angles). 4. The surface of a quote or a difference of level.5. Treated leaving of the projected speed lines. 6. Tracking of the coupling curves. 7. Deble and ramble gabaration. 8. Methods of planning

the characteristics of the constructions. 9. Transmission of proposed floors and foundations. 10. Determination of construction hearing and vericity. 11. Loss of support network by gps measuring - static method with dual frequency gps equipment. 12. Processing gps observations. 13. Transformation of wgs 84 coordinates in stereo coordonate 1970. 14. Creating a road drive.15. Achiving of a situation plan.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 50%, ongoing assessment50%
ASSESSMENT TYPE: verification

## PHYSICAL GEOGRAPHY

CREDITS: 3
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Interpretation of relations between the geosystem and the neighboring systems (cosmic space and the terrestrial internal system) and the formation of a synthesis image of the Earth's shells (the lithosphere, the reliefosphere, the atmosphere, the hydrosphere, the biosphere, the anthroposphere) and the relations between them.
TOPICS: Geography: object, principles, methods. Geographic cover, geographic environment, geosystem and its characteristics. Geographical environment laws. Global laws: the law of zoning, the law of inter-consistency, the law of patrolling, the law of azonality. Specific laws. Characteristics of the Universe.The Structures of the Universe.Coordinates of the heavenly sphere. Solar system. Sun: characteristics, internal structure, solar activity and influences on the terrestrial surface. The Earth - Moon - Sun system. Phenomena resulting from the relationship Earth - Moon - Sun. The shape and dimensions of the Earth. Geographical coordinates. Rotating ellipsoid and geoid. The importance of Earth's shape and dimensions for space applications. The Movements of the Earth.Earth's rotation movement and its consequences. The Revolutionary Movement of the Earth and Its Consequences. Precession and forced labor. The internal structure of the Earth.Characterization of the Earth's inner shells. Composition of the Earth's crust and bark types. Geophysical properties: Earth density, Earth's thermality, gravity, terrestrial magnetism, magnetosphere and its importance, internal radioactivity. Litosfera and its structure in plates. Mechanism and causes of plate movement. Theory of global tectonics. The phenomenon of subduction. Phenomena associated with the dynamics of the bark: formation of mountain units in the view of global tectonics; volcanism and the spread of volcanoes on the Globe, their earthquakes and geographical area. Land Relief. Planetary Relief: Continents and Oceans. Major Relief.Relief of ocean basins. Medium and minor relief. The Atmosphere and its Importance for Earth.Evolution of the atmosphere. Limits, composition and structure of the atmosphere. The general circulation of the atmosphere. Hydrosphere.The characteristics of the hydrofoil and its units. General Circulation of Ocean Waters.Ocean - Atmosphere Relationship.The laws of the water envelope. Biosphere. Factors influencing the distribution of living organisms. Pedosphere. Biosphere.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## HISTORY OF GEODESY

CREDITS: 3
YEAR/SEMESTER: III$^{rd}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Explaining and interpreting problems in the field of geodetic engineering through the argumentative use of techniques, concepts and fundamental principles in mathematics, physics as well as those specialized in topography, geodesy, photogrammetry, remote sensing, cadastre, etc.

TOPICS: The beginnings of science in prehistoric times. Representations of the shape and dimensions of the Earth, I.H.
Instruments and methods of observation in antiquity. Geodesy in the Greco-Roman world.
Land measurements among the Geto-Dacians. Geodesy concerns in the Middle Ages, in Asia and Europe. Geodesy and cartographic works in China, India and Persia.
The development of astronomy and geodesy among the Arabs.
Astronomical, geodesy and cartographic concerns on the territory of the Romanian Countries
The development of geodesy in the 19th century worldwide and in Romania in particular. Schools from Wallachia and Moldova in the field of geodesy (land surveying engineers)
The 20th and 21st centuries and Romanian geodesy. History of national and local geodetic networks determined by trilateration, triangulation and GNSS technology measurements in the 21st century.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

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## 4TH YEAR OF STUDY

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### LAND IMPROVEMENTS

CREDITS: 5
YEAR/SEMESTER: IV$^{th}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVE(S): Knowledge and understanding of the importance of land reclamation works; Knowledge and understanding of phenomena such as soil erosion and landslides; Knowledge and understanding of regional planning elements and all works and measures to prevent and combat soil erosion and landslides.
COURSE CONTENTS: Introduction - General problems. Subject discipline. The importance and characteristics of land reclamation works. Brief history of land improvement. Water cycle. Correlation reclamation preserve and improve the environment. Some general concepts specialty. Soil erosion. Definition, importance and spread of erosion in the world and in Romania. The mechanism of erosion by water. Determinants of soil erosion. The damage caused by erosion. Studies required for the project works to combat soil erosion. Mapping and soil erosion research. Preventing and combating soil erosion on sloping arable land.Prevention of soil erosion and vine plantations. Prevention and prevention of soil erosion in orchards. Prevention of soil erosion and pastures. Prevention of erosion and depth. Erosion depth configurations, their development and to combat erosion ball work. Prevention and wind erosion. Landslides. Measures to prevent and combat them.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

### PHOTOGRAMMETRY II

CREDITS: 4
YEAR/SEMESTER: IV$^{th}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Explanation and interpretation of some problems related to the coordinate system used in photogrammetry, photogrammetry scale, photoplaning methods.

TOPICS: Planimetric photogrammetry; Coordinate system used in photogrammetry; Photographic orientation elements; Elements of the central projection. Photo ladder; Deformations on the photogram. Recovery of photograms; Classification of recovery methods; The general properties of recovery; Graphical Recovery Procedures; Grapho - mechanical method of recovery; Optical-graphic methods of recovery. Fotoredresarea; Fotoredresatorul; Classification of photoreceptors; Construction of photovoltaic panels. Types of photoreceptors; Optical-mechanical recovery in the photoreceptor. Makefotoplane; Drawing photoplan; Fotoschema and photo assemblage. Stereofotogrammetria; Direct stereoscopic view; Indirect stereoscopic view; Stereoscopic measurements; Stereoscoapele. External orientation of photograms; The general case of the double spatial retrointersection; Relative orientation; Absolute orientation. Terrestrial photogrammetry; General; Cases for taking photograms in terrestrial photogrammetry; Exploitation of terrestrial terrestrial alarms. Precision in terrestrial photogrammetry; Terrestrial photogrammetric cameras.
Photogrammetric; Number of support points required; Photogrammetric screening cases; Conditions to be met by a photogrammetric marker; Photogrammetric surveying technique. Radial plane phototriangulation; Principles and types of planar radiographic phototriangulation; Planar radiographic phototriangulation; Planar-numerical phototriangulation. Aerotriangulaţia; Definition, classification; Coordinate systems; The principle of aerotriangulation; Design of aerotriangulation works; Data collection. photo interpretation; Definitions; Advantages and limits of photo interpretation.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

**TERRITORIAL PLANNING AND URBAN PLANNING**

CREDITS: 5
YEAR/SEMESTER: IV$^{th}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Using the methods to draw up the situational plans; Use of framework content to develop PUD; Use of the Territorial Balance Sheet calculation methods; Graphical execution of situation plans and PUD sby classical and modern methods, according to the required situation.
TOPICS:1. The historical evolution of urbanism. 2. Urban structure of the territory.3. Landscaping. 4. Land use planning documentation andurbanism. 5. Land occupation and location of buildings. 6. Urban planning. 7. Urban transport and traffic problems. 8. Equipment and technical and town planning. 9. Urban dwelling.10. Powers of public administration in the field of spatial planning and urban planning.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: exam: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

**PROJECT TOPOGRAPHY AND ENGINEERING MEASUREMENT**

CREDITS: 2
YEAR/SEMESTER: IV$^{th}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of project
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: use of topographic devices; drawing of connecting curves; topographic measurements performed when drawing land improvement works; drawing of works for the reservoir; measurements of level differences and calculation of point elevations; drawing of dimensioned plans and drawing of contour lines; making longitudinal and transverse profiles for land improvement works; drawing of terraces and leveling of surfaces; drawing of characteristic points of constructions on the plan; drawing and execution of civil, industrial and agricultural constructions; drawing on the ground the route of a communication route; drawing and opening of lines in the forest; drawing on the ground projects of bridges and viaducts.
TOPICS: Analysis of the content of the pre-feasibility and feasibility study. Analysis of the content of the investment execution project. Calculation of the layout elements from the coordinates of landmarks

and projected points. Planimetric and leveling of a support network. Lifting and plotting the characteristic points of the constructions. Transmission of the elevation at the floor and in the foundations and determination of the height of the constructions. Calculation of the areas related to the location of various engineering works. Calculation and plotting on the ground of the lines for rectifying the boundaries. Calculation and plotting on the ground of the lines for dividing the plots. Leveling of the areas and drawing up profiles from the data collected on the ground.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: project - answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: project

**AUTOMATIC DATA PROCESSING OF GEODETIC DATA**

CREDITS: 5
YEAR/SEMESTER: IV$^{th}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES:The field of "Automatic Topo Geodetic Data Processing (P.A.D.TG.)" provides students with the theoretical and practical support of taking, processing and reporting measured topographic data.It offers the acquisition of the fumamental notions of the automatic processing of topogeodic data creating the applicative concepts for the specialized works by using and assembling the basic knowledge of geodesy, topography and cartography assimilated to the specialized courses and the use of the advanced computing technique in order to optimize the specialized works..
TOPICS: Aspects regarding the automation of the topo-geodetic data acquisition process measured in the field. Description of the transfer software measured from the device to the computer - GPS measured data. Automatic processing of GPS data. Description of the transfer software of the measured data from the device to the computer - Data measured with the total station. Automatic processing of measured data with the total station. Description of the transfer software of the measured data from the device to the computer - Data measured with the digital level. Automatic processing of measured data by levelment. Program models used for computerized calculation of topo-geodetic measurements. Using AUTOCAD to graphically process data from measurements. Carry out the situation plan in AUTOCAD. Editing topo-cadastral plans with TOPOLT program. Using the TOPOSYS program in the automatic processing of topogeoidal data.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

**SPECIAL TOPO ELEVATIONS**

CREDITS: 5
YEAR/SEMESTER: IV$^{th}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Correct use of geodetic engineering concepts and tools for the development of topographical, site, cadastral plans. Explanation of the way of drawing up the topographic plans of the situation, execution, cadastre and the peculiarities of each of them.
TOPICS: Solving triangulation networks for special topo racks. Topographic works in mining exploitation to date. Creation of support network. Topographic works in mining exploitations to the day. Determination of excavated volumes. Calculation of the volume in terraces. The volume of dykes and embankments. Underground support networks. Supporting network features. Design of supporting framework. Geodetic and topographic networks for tunnels and bridges. Topographic elevation of river valleys, basin and lakes. Topographical works necessary for hydrological studies.
Lifting of technical and public underground networks in localities. Topographical surveys required for airport design and construction. Topographic elevations at road design and construction. Topographic

elevations in rail transport. Topographic works on water cadastre and communication paths.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## UNDERGROUND TOPO MEASUREMENT

CREDITS: 5
YEAR/SEMESTER: IV$^{th}$ Year / I$^{st}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 14
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Carrying out specific topographic surveys necessary for the development of plans: topographic, situational, execution and cadastral.
The purpose of the course is to provide students with theoretical and practical knowledge regarding the creation of the planimetric and altimetric reference system underground, the lifting of details from underground, the management of the execution of various types of underground mining works and the reception of underground and quarry mining works.
TOPICS: General information about underground mining works. Mining topographic reference system. Topographic surveys and mining topography operations at the surface. Topographic support network from underground. Transmission of the planimetric reference system from the surface to the underground. Underground planimetric surveys. Underground altimetric surveys. Underground detail surveying. Topographic management of underground mining works. Reception and evidence of underground and quarry production.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## BEHAVIOR MONITORING LAND AND BUILDINGS

CREDITS: 4
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 11
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: The role of structural monitoring in building health care. Legislation in the field of structural monitoring. Classification of land and building behavior tracking. Static and cinematic methods. Topographic Tracking Networks.Design of tracking works. General methods of static tracking. General methods of kinematic, quasistatic, quasidinamic, dynamic tracking. Tolerances and precision of structural monitoring methods.
TOPICS: General notions on land and building behavior tracking. Methods of measuring deformations and displacements of constructions. Tracking of deformations of constructions by topo-geodesic methods. Using models to study and track construction deformations. Static and kinematic models for the determination of deformations. Topo-geodetic methods for measuring displacements and deformations. Using high precision geometric and trigonometric method. Using static and cinematic GPS methods to monitor landslides. Using modern measuring equipment to track the behavior of buildings and land. General notions on land and building behavior tracking. Classification of tracking activity over time of land and buildings. Categories of movements of geometrically monitored constructions in static regime: compaction of foundation ground, variation of groundwater level. Categories of motion movements of geometrically monitored constructions in static regime: compactions, horizontal displacements of buildings, landslides, diving, permanent inclinations of high structures. Description of the tracking network for land and construction behavior.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## ORGANIZATION OF TOPO-GEODETIC WORKS

CREDITS: 2 exam, 2 project
COURSE COORDINATOR:
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of project
NUMBER OF WEEKS: 11
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: General notions of the enterprise. Company law. Classification of works in the field of land measurements. The importance of managerial activity in organizing and conducting geodetic works. Production, productivity, efficiency and efficiency of geodetic works. Driving styles and leadership. Human resources management. Norms and norms in the activity of land measurements. Normalization of work in terrestrial measurements. The antecedence and the cost of geodesic works.
TOPICS: Processes and management relationships. Business management functions. Human resource management. Driving and control. Principles and management system. The entrepreneur, the firm and the environment. Types of companies. Company strategy and management. Decision-making and information systems of the firm. Managers relationship – subordinates. The company's internal rules of order.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%, project 100%
ASSESSMENT TYPE: exam, project

## WORKS OF ART, HYDRO-TECHNICAL CONSTRUCTIONS, TECHNICAL-MUNICIPAL NETWORKS AND LAND IMPROVEMENT

CREDITS: 4
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of practical works
NUMBER OF WEEKS: 11
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Knowledge and understanding of the particularities of the hydro-technical constructions and works, art works, land improvement and technical-urban networks.
TOPICS: River basins. Hydraulic engineering and construction. General. Classifications. Hydrotechnical transversal works in hydrographic basins. Debt clearing works. Dams for water accumulation. Irrigation systems. Water inlets. Inverse. Channels and pipes. Hydraulic extractors. Power dissipators. Longitudinal hydrotechnical works in river basins. Works to regulate the bed. Damming. General.Dikes. Drainage and Drainage Systems and Works.Works of art. Works to prevent and combat soil erosion. Technical and hydro technical works on the slopes. Technical and municipal networks. Exploitation and maintenance of constructions, hydro-technical and art works.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## REMOTE SENSING

CREDITS: 3
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 1 hour of practical works
NUMBER OF WEEKS: 11
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Deepen knowledge of the teledetection-specific terms and associated sciences.Knowledge of remote sensing applications and recording and research equipment of importance in the field and with applications in agriculture.Knowing the phenomena of remote sensing.Recognition of satellite equipment.Studying the remote sensing device.Acquiring the characteristics of solar and non-solar sources.Knowledge of remote sensing data processing systems.Studying remote sensing data interpretation

systems.
TOPICS: Introduction and fundamental components of a remote sensing system. Electromagnetic radiation.Electromagnetic spectrum.Phenomena of interaction of radiation with the atmosphere.Phenomena of interaction of target radiation.Description and operation of passive sensors and active sensors.Characteristics of remote sensing images.Types of resolutions.Spatial resolution, scale and pixel size.Spectral resolution, radiometric resolution, temporal resolution.Multi-Spectral Scanning.Characteristics of thermal imaging.Geometrical distortions of images.Description of digital cameras and aerial photography. Microwave Radiation. Radar Radar, Interaction with Target. Radar image distortions. Radar image properties. Airborne radar systems and space systems. The orbits of the satellites. Satellite capture tools. Ground transmission and preprocessing of remote sensing data. Classification of images. Spectral classification. Satellite programs.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to exam 60%, ongoing assessment 40%
ASSESSMENT TYPE: exam

## ELABORATION OF DIPLOMA PROJECT

ECTS CREDITS: 4
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 4 hours of project
NUMBER OF WEEKS: 11
TYPE OF COURSE: specialization discipline
COURSE OBJECTIVE(S): Performance of scientific multidisciplinary / interdisciplinary research projects using innovative methods with significant impact on the development of agriculture sector; Ability of drawing conclusions and suggesting solutions / recommendations for academic research and practice in agriculture sectors, based on the research studies performed.
COURSE CONTENTS:
Finalisation of Diploma Project plan and references; Specialty literature reviews based on academic specialty resources recommended by the research supervisor or other sources considered as being relevant by the student; Finalisation and implementation of the research methodology intended for the achievement of objectives; Preparation and drafting of the Diploma Project; Presentation of results and conclusions of the research studies.
LANGUAGE OF INTRUCTION: Romanian
ASSESSMENT METHOD(S): admitted / rejected

## LAW AND LAND-CADASTRAL LEGISLATION

CREDITS: 3
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 11
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Acquiring essential notions regarding the legal regime of land in Romania as well as on real estate advertising.
TOPICS: Introduction to the legal system and its divisions. Sources of law. Legal rule. The notion, object and sources of land-cadastral law. The legal regime of the land categories from the land fund of Romania.Land ownership right. Characteristics and forms of ownership. Public property and private ownership of land. Obligations of landowners. Legal liability in the land area. Legal regulation of the general cadastre system. Making real estate publicity through land books. Organization and operation of the National Agency for Cadastre and Real Estate Advertising.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## PRACTICE AND ELABORATION OF DIPLOMA PROJECT

ECTS CREDITS: 5
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 30 hours of project
NUMBER OF WEEKS: 3
TYPE OF COURSE: specialization discipline
COURSE OBJECTIVE(S): Performance of scientific multidisciplinary / interdisciplinary research projects using innovative methods with significant impact on the development of agriculture sector; Ability of drawing conclusions and suggesting solutions / recommendations for academic research and practice in agriculture sectors, based on the research studies performed.
COURSE CONTENTS:
Finalisation of Diploma Project plan and references; Specialty literature reviews based on academic specialty resources recommended by the research supervisor or other sources considered as being relevant by the student; Finalisation and implementation of the research methodology intended for the achievement of objectives; Preparation and drafting of the Diploma Project; Presentation of results and conclusions of the research studies.
LANGUAGE OF INTRUCTION: Romanian
ASSESSMENT METHOD(S): admitted / rejected, thesis presentation and defense - 100%

## ASSESSMENT OF IMMOVABLE PROPERTY

CREDITS: 3
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 11
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Theoretical and practical training of students in order to acquire the knowledge and methods for obtaining the technical documents of the real estate valuation reports.
TOPICS: Evaluation activity, basic concepts in evaluation, conceptual field and ownership concept; Real estate market - characteristics of real estate markets, their types, real estate market analysis, value of real estate properties - value types; Types of evaluation. Land valuation, land valuation methods:- Commercial Sales Technique; -the technology of plots and development; -assignment method; -the extraction technique; -the residual technology; -capitalization of land rent. Organizing and conducting evaluation activities. Specific evaluation principles. Structure of the evaluation report. Diagnosis of real estate - the stage preceding the evaluation. Evaluation methods.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification

## USE OF ELECTRONICS IN GEODESY

CREDITS: 3
YEAR/SEMESTER: IV$^{th}$ Year / II$^{nd}$ Semester
HOURS PER WEEK: 2 hours of course, 2 hours of seminar
NUMBER OF WEEKS: 11
COURSE TYPE: specialization discipline
COURSE OBJECTIVES: Design and construction of support networks for topographic surveys, cadastral surveys and other engineering works.
TOPICS: Notions of applied electronics.
Power sources and autonomy of geodetic instruments. External power supply of geodetic instruments. Radio and GSM communication CCD cameras and CMOS sensors. Integrated electronic devices of total stations. Electronic time measurements. Electronic positioning methods.
TEACHING LANGUAGE: Romanian
KNOWLEDGE ASSESSMENT: answers to final examinations 60%, ongoing assessment 40%
ASSESSMENT TYPE: verification