Transilvania University of Braşov, Romania

Study program: Forestry

Faculty: Silviculture and Forest Engineering
Study period: 4 years (bachelor)

1st Year

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Mathematics	MATE	5	2	2	-	-

Course description (Syllabus): Vectors and linear analytical geometry; Calculus; Linear algebra; Applications.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Biostatistics	BIOS	4	2	-	2	-

Course description (Syllabus): The course targets the following main aspects: The introduction in and description of the main statistical indicators; Description of the main theoretical fitting distributions; Correlation analysis; Regression analysis; Analysis of variance (One-way-ANOVA, two –way ANOVA); Sampling designs

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Technical Drawing and Cartography	DTC	4	2	-	2	-

Course description (Syllabus): Introduction. Orthogonal projection; International standards of technical drawing; Multiview projection; Axonometric projection; Architectural drawing; Engineering drawing; Cartography. Map projections. Topographic map; Map design.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest informatics	INFF	5	2		2	

Course description (Syllabus): Knowing the facilities offered by spred sheets program EXCEL and workflow of the program AutoCAD.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Biochemistry	BIOCH	4	2	-	2	-

Course description (Syllabus): Physico-chemical characteristics of living matter; Monoglucides. Poliglucides; Simple lipids. Complex lipids; Monoprotids (amino acids). Poliprotids; Heteroproteids; Liposoluble and water-soluble vitamins; Enzymes; Dynamic biochemistry. Metabolism of carbohydrates, lipids, proteins. Biochemical correlations between metabolisms.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Soil Science, with Elements of Geology and Geomorphology	PEGG	5	2	-	2	-

Course description (Syllabus): PART I. ELEMENTS OF GEOLOGY: Cap. 1. Introduction. Definition of geology, object, purpose, research methods. Cap. 2. Earth as a planet. Space position, shape, dimensions, movements. The Earth

structure. Litosfera and terrestrial crust. Age and evolution of the Earth. Cap. 3. Elements of dynamic geology. Cap. 4. The mineralogical and petrographic composition of the earth's crust. Cap.5. Graphical representation of lithology and geological structures. Cap. 6. The morphostructural units of Romania. PART II. ELEMENTS OF GEOMORPHOLOGY: CAP. I. Introduction. Earth crust relief. The genetic factors of the relief. The main types of terrestrial crust relief. Relief of mountain, plateaus and plains. Cap. II. Role of lithology and geological structure in relief modeling. CAP. III. The volcanic relief. CAP. IV. Genesis and evolution of Romania's relief. PART III. GENERAL PEDOLOGY: CAP. I. Introduction. Pedology as a science. Subject, purpose, research methods. CAP. II. Formation and general composition of the soil as a system. CAP. III. Formation and composition of soil mineral component. CAP. IV. Formation and composition of the organic soil component. CAP. V. Soil chemical properties. CAP. VI. Physical and physical-mechanical properties of the soil. CAP. VII. Hydrophysical soil aeration and thermal properties.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Academic writing	SA	1	1	-	-	-

Course description (Syllabus): structure and contents of academic papers, literature review, using and citing sources of ideas, plagiarism, academic writing, oral presentations.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Soils and Sites	SSFOR	5	2	-	3	-

Course description (Syllabus): Classification and characterization of soils in Romania. Ch. 1. Soil classification in Romania. General aspects, basic principles, classification units. Soil classification in other countries. Ch. 2. Protisols; Ch. 3. Cernisols; Ch. 4. Umbrisols, Cambisols; Ch. 5. Luvisols; Ch. 6. Spodisols; Ch. 7. Hidrisols; Ch. 8.Histisols. FOREST SITES: Ch. 1. Forest site as a system. Definition of the site as geotope and ecotope. Components. Fundamental features. Ch. 2. Analysis of site components: rock, relief, climate, soil. Ch. 3. Basic principles and working method in Romanian forest mapping and typology. Objectives. Working method, preliminary works, fieldwork, office work. Ch. 4.,5,6,7 The characterization of the main forest sites in Romania. Mountain forest sites (FM). Hills forest sites (FD). Ch. 8. Plain forest sites (FC).Ch. 9. Forest steppe forest sites (Ss). Forest sites of the Meadow and Danube Delta.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Meteorology and Climatology	METEO	4	2	-	2	-

Course description (Syllabus): Introductive elements; The atmosphere; Radiation energy; Heating and cooling processes at the subjacent surface level, in the active layer and in the air; Air movements; The atmospheric water; Notions of synoptic meteorology; Climatology's basic issues; Synthesis elements.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Botany	BOT	4	2	-	2	-

Course description (Syllabus): Part one – Plants morphology: Chapter I – Vegetal cell; Chapter II – Vegetal tissues; Chapter III – Morfology and anatomy of vegetative plants organs: root, stem, leaf; Chapter IV – Plants reproduction. Part two – Plants systematics (taxonomy): Chapter V – Introduction to taxonomy; Chapter VI – *Procariota*: *Bacteriophyta* and *Cyanophyta;* Chapter VII – *Eucariota*: *Chlorophyta*, *Mycophyta* and *Lichenophyta;* Chapter VIII – *Bryophyta*, *Pteridophyta*, *Gymnospermatophyta* and *Angiospermatophyta.*

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Topography-geodesy I	TOPO1	4	2	-	2	-

Course description (Syllabus): This course introduces fundamental principles for drawing the plans and maps. Topics covered in this course include: Instruments and methods for angles measurement. Instruments and methods for

distances measurement. Instruments and methods for leveling. Principles for topographic survey. Tahimetric traverse method. Geometric leveling traverse method. Areas calculation. Drawing plans and maps

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Dendrology I	DEN1	5	2	-	2	-

Course description (Syllabus): Study of woody species (trees and shrubs) from *Ginkgoaceae, Pinaceae, Taxodiaceae, Cupressaceae, Taxaceae, Ephedraceae, Magnoliaceae, Ranunculaceae, Berberidaceae, Fagaceae, Betulaceae, Ulmaceae and Moraceae* families, regarding: taxonomic classification; morphological descriptions; natural range and area of forest cultures; ecological requirements; biological characteristics (for the main tree species).

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Genetics	GEN	4	2	-	1	-

Course description (Syllabus): Introduction to genetics - Concepts, scope and importance. Basic genetics – Tree genome, gene expression, gene structure and regulation, cytogenetics. Transmission genetics – Mendelian genetics, transmission and inheritance of chromosomes, extensions to Mendel's laws, sex determination in forest trees, types of characters. Genetic markers. Population genetics – genetic structure, measurement of genetic variation within and among populations, mating system, inbreeding, mutations, gene flow, genetic drift, selection.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Practical Training I	PSS1	2	60 hours			

Course description (Syllabus): Assisted Botanical Practice in forest ecosystems nearby Brasov. Topography-assisted practice: Meteorology and Forest Climatology - assisted Practice.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
English language I	LES1/LES/2	2	1	-	1	-

Course description (Syllabus): Tenses and aspects; verb forms (+spelling); forms and meanings of tenses; forms and meanings of aspects; temporal-aspectual combinations (e.g. past perfect continuous, future in the past etc.) in the affirmative, interrogative, and negative. Passive voice: form and use ; Reported speech; Conditional clauses; Revision.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
English language II	LES1/LES/2	2	1	-	1	-

Course description (Syllabus): The Noun; The Article; The Genitive; The Adjective; The Preposition; Relative Pronouns; Revision.

2nd Year

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Game management	FAUNA	6	3	-	3	-

Course description (Syllabus): Description of main games species ecology and ethology, distribution in Romania and management description of the mountain river fishes and management techniques for increasing river productivity. Knowledge regarding game and fish farming

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Constructions	CONF	5	2	-	-	2

Course description (Syllabus): Main issues: Overall composition of buildings. Dimensional design and tolerances. Technical prescriptions and constructions design; Wood; Mineral binders; Natural stone building materials; Concrete with mineral binders; Ceramics; Roofs; Slabs; Walls; Foundations; Construction of forestry interest.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Topography-Geodesy II	TOPO2	3	1	-	1	-

Course description (Syllabus): Course 1. Geodesy – object, references systems, coordinates, ellipsoid reduction of distances and angular observation. Course 2. Spherical excess. Meridian convergence. Cartographic projection: description and classification. Azimuthal projections. Course 3. Gauss-Kruger and Stereographic 1970 projection: characteristics. Course 4. Geodetic networks. First order, second-order, third-order, fourth-order triangulation. GNSS networks. Course 5. Geodetic network adjustment. Topographic and geodetic coordinates transcalculating Course 6. Global Positioning Systems GNSS: positioning principle, segments. Permanent base stations. Course 7. Methods of determination using the GNSS technique. Working mode. GNSS errors.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
GIS	GIS	5	1	-	3	-

Course description (Syllabus): System. Data and information. Informational system – information system. Geodesy – geodetic data; GIS specifics in relation to other data processing systems; GIS for different fields. Short history of GIS; Data acquisition; GIS functions; Topology. Creating topology in AutoCAD MAP. Digitising plans in AutoCAD MAP; Erorrs in GIS.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Dendrology II	DEN2	5	2	-	2	-

Course description (Syllabus): Forest woody species (trees and shrubs) study from the families: *Juglandaceae, Grossulariaceae, Rosaceae, Cesalpiniaceae, Fabaceae, Anacardiaceae, Simaroubaceae, Aceraceae, Hippocastanaceae, Staphyleaceae, Celastraceae, Rhamnaceae, Loranthaceae, Elaeagnaceae, Tamaricaceae, Salicaceae, Cornaceae, Tiliaceae, Ericaceae, Caprifoliaceae, Oleaceae, Solanaceae, Bignoniaceae and Scrophulariaceae* regarding: taxonomic classification; morphological descriptions; natural range and area of forest cultures; ecological requirements; biological characteristics (for the main tree species).

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Entomology	ENTO	4	2	-	2	-

Course description (Syllabus): **External structure of insects; Internal structure and function; Outbreaks of insects.** Population dynamics of forest insects. Insect detection and forecast; **Prevention and control of insects.** Preventive measures. Mechanical, chemical, biological and integrated control; **Damaging insects. Insect biology and control:** Defoliating insects (*Lepidoptera*, *Coleoptera*); Terminal, shoot, twig and root insects **(***Coleoptera*, *Lepidoptera*, *Ensifera*); Phloem boring insects **(***Coleoptera*); Wood boring insects (*Coleoptera*, *Lepidoptera*, *Hymenoptera*); Seed and cone insects (*Coleoptera*, *Lepidoptera*); Gall makers (*Hemiptera*, *Hymenoptera*, *Diptera*).

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Afforestations I	ÎMP1	4	2	-	2	-

Course description (Syllabus): Fundamentals of seed production; Harvesting, processing and storage of fruits and seeds; Seed testing;Characteristics of seed germination process; Organisation of forest nursery; Soil preparation and plant nutrition; Production of bare-root and container seedlings from seed; Vegetative production of seedlings; Forest seedling cultivation and maintenantce. lifting, storage and handling.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Dendrometry I	DENDR1	4	2	-	2	-

Course description (Syllabus): The course is concerned with the measurement of the various dimensions of trees, as well as the statistical properties of tree stands.These measurements are used to find, through allometric relations, other tree properties that are harder to measure directly. Topics covered in this course are: Introduction; Theory and mathematical modelling of form and volume of tree bole; Theory of calculation of bole volume and of bole part volume; Theory of tree and its part measurement; Theory of volume measurement.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Ecology	ECOL	4	2	-	2	-

Course description (Syllabus): Introduction; Forest ecology; Levels of organization in the living world; Ecological niche and Growing space. Laws of ecology; The living community; The non living environment (i.e. the biotope). Ecological factors with direct action; The non living environment (i.e. the biotope) – cont.. Ecological factors with indirect action. The ecosystem / structure, function, dynamics, limits (the ecotone); Cycle of organic matter within the ecosystem; Relationships inside the forest ecosystem; Forest ecosystem dynamics. Regular changes in the living community. Disturbances; Structures of the forest ecosystem resulted from disturbances. Developmental stages of the forest ecosystem; Succession; Ecosystem stability. Biological diversity; Natural resources management and biodiversity conservation.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Products I	PROD1	4	2	-	2	-

Course description (Syllabus): The course is structured on the following content coordinates: Woody plants – source for raw material for industrial applications; Anatomical constitutive parts of stems and branches; Secondary xylem genesis mechanism; seasonal activity of the cambium reflected in the annual growth rings structure; Wood architecture (morphological and chemical) at sub-microscopic, microscopic and macroscopic levels – interspecies variations; Physical properties of the wood (moisture, density, inflation, deflation), mechanical properties, calorimetric properties and wood burning, acoustic properties; Wood natural durability and its improvement means; Wood sorting: the first step in raw material conversion into products; Products from or with wood participation: sawn timber, veneers, composites and coal.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Silviculture I	SILV1	5	2		2	

Course description (Syllabus): The course targets the knowledge of: the extent, role and multiple functions played by the forest; forest structure (phytocoenosis - tree layer, shrub layer, seedling layer, herbal layer, microphytocoenisis - and zoocoenosis); ecosystem processes taking place in the life community of forests (e.g., natural regeneration of forest; completion of establishment phase; growth and increment of trees and stands; development of trees and stands; natural pruning of forest trees; tree differentiation and natural mortality in the forest; succession of forest vegetation).

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Practical Training II	PSS2	3	90 hours			

Course description (Syllabus): Dendrology-assisted practice in the neighboring forests of Brasov; Pedology-assisted practice in the neighboring forests of Brasov; Preparing the individual report and supporting the practice of Dendrology – Pedology; Dendrometry-assisted practice in the neighboring forests of Brasov; Data processing from field measurements and individual evaluation of Dendrometry practice; Practice assisted by Forest Entomology in the neighboring forests of Brasov; Assisted practice in the field of forestry construction on construction sites in Brasov.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
General machine lecture	CGM	4	2	-	2	-

Course description (Syllabus): Concepts of materials study; Main body parts of mechanical engineering; Metallic joinings: dismountable and undismountable; The mechanical engineering and the exploitation of engines with internal combustion; The dynamics of forestry machines; Engineering and exploitation of machines transmissions.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Mechanics and Strength of Materials	MRMS	4	2	2	-	-

Course description (Syllabus): Course objectives: Mechanical modelling of real structures. The analyse and design of structures using strength of materials principles. Main issues: Statics; Equilibrum of rigid bodies; Traction – compression; Torsion; Bending; Displacement evaluation.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
English Language	LES3	2	1	-	1	-

Course description (Syllabus): Pedology – English terminology; Dendrology – English terminology; Ecology – English terminology; Botany – English terminology; Fauna – English terminology; Entomology – English terminology; Revision.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
English Language	LES4	2	1	-	1	-

Course description (Syllabus): Academic writing as a process: planning and organizing a text; Elements of writing: logical connectors, style; Accuracy in writing; Writing models: abstracts; Writing models: CVs; Writing models: cover letters; Revision.

3rd Year

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Transports	TRANSP	4	2	-	-	2

Course description (Syllabus): The course targets follow the main aspects: In each chapter are analyzed the problems regarding the knowledge of the forest transports respectively: introduction, plannig and design, construction and features, management and maintenance. The aims is to acquire knowledge regarding the design, construction and management of forest roads in Romania that is available to all sectors of the forest industry – both public and private, foresters and land owners, engineers and contractors, as well as students of forest management and forest engineering.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest management (I)	AMEN 1	4	2		2	

Course description (Syllabus): The course is concerned with the organization, optimization, management and regulation of structural and functional forest under complex tasks of socio-economic environment and forestry household. Topics covered in this course include: notion and general principles, principles, means and possibilities of forest territorial organization, basic criteria in organization and structural-fonctional management of stands, exploatability, normal production funds.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Silviculture II	SILV2	5	2		1	1

Course description (Syllabus): The course aims at presenting three important issues: Natural regeneration of forests (e.g., regeneration under shelter; regeneration on bare land; regeneration in the forest boundary); Tending operations (i.e. classification of tending operations; description of various tending operations: release cutting, cleaning-respacing, thinning, hygiene cutting, artificial pruning, removal of epicormic branches, tending of forest boundary. The effect and intensity of tending operations); Regeneration methods and silvicultural systems (e.g., terminology, classification of regeneration methods and silvicultural systems; description of main silvicultural systems: clear-felling, strip felling, uniform shelterwood system, group shelterwood system, selection system, irregular shelterwood system, low coppice, pollarding, coppice-with-standards; selection of regeneration method and choice of silvicultural system; special conservation fellings).

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Wood exploitation I	EXPL1	5	2		2	

Course description (Syllabus): The course targets the knowledge of: objectives of trees extraction; harvesting operations: felling, bucking, topping and debranching; logging operations; landing area operations: sorting, bucking, splitting, chipping, debarcking; Wood transportation.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Dendrometry (II)	DENDR2	4	1		2	

Course description (Syllabus): The course aimed at acquiring theoretical knowledge and practical biometric measurement and modeling of trees and forest stands – in terms of structure, size and production growth fund. Topics covered in this course include: forest inventory, determination of stand volume, sorting stand, determining increases in trees and stands, the study increases the trees and brush and getting dendrochronology.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Products II	PROD2	4	1	-	2	-

Course description (Syllabus): The course is structured on the following content coordinates: Wood grading; Edible and poisonous mushrooms in forest - biology, ecology and uses; Berries - taxa, properties and uses; Forest medicinal and aromatic plants - active ingredients and products; Bee products.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Plant physiology	FIZPL	4	2	-	2	-

Course description (Syllabus): Chapter I – Cell physiology; Chapter II – Photosynthesis; Chapter III – Organic substances dynamics in plants body; Chapter IV – Respiration; Chapter V – Water regime; Chapter VI – Mineral nutrition; Chapter VII – Nitrogen nutrition; Chapter VIII – Plants development (growth and differentiation).

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest management (II)	AMEN 2	4	2			2

Course description (Syllabus): The course is concerned with the organization of sustainable forest for her household, modeling structure and size of production of forest fund, design of management measures in relation to the functions assigned to forest stands and development forest management plans. Topics covered in this course include: planning methods, planning of management operation of the forest normalization process, harvesting plan, possibility establishment management revisionand the new project organization.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Phytopathology	FITO	4	2	-	2	-

Course description (Syllabus): Introduction; Plant diseases; Phytopathogenic agents; Prevention and control measures of the phytopathogenic agents; Phytopathogenic viruses; Phytopathogenic mycoplasma; Phytopathogenic bacteria; General characters of phytopathogenic fungi; Fungi which produce diseases on the leaves, on the bark and the coloring and the rot of the wood; Fungi which damage plantlets, seedlings, fruits and seeds.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Torrential watershed management I	TOR1	4	2	-	2	-

Course description (Syllabus): First Part: NOTIONS OF TORRENTIAL HYDRAULIC: Hydrostatics; Hydrodinamics; Spillways; Uniform permanent flow in open channels. Second Part: TORRENTIAL PROCESS, TORRENTIAL FORMATIONS AND TORRENTIAL WATERSHEDS: Morpfology of torrential formations; Morpfometry of torrential watershed; Hydrology of torrential watershed.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Management and Forest Economics	MECFOR	4	2	2	-	-

Course description (Syllabus): The basics of forest economy and forest management. Forecast, planning, and organisation in the forest sector. Decision (in certain and uncertain conditions, and risk). Leadership. Human resources management. Particularities of the forest sector. The business environment. The Markets. Forestry marketing. Business strategies in the forest sector. Business plan. Organisational behaviour. Social responsibility. Assessment and control. Quality assurance. Entrepreneurship. Concepts. The entrepreneurial company. Entrepreneurial strategies.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Plant geography and phytosociology	FF	3	2	-	1	-

Course description (Syllabus): Vegetation history; Vegetation patterns at global and national level; Principles and methods of vegetation study; Syntaxonomy of plant communities. The Braun-Blanquet approach; Applications of phytosociology. Forest typology.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Practical Training III	PSS3	3	90 hours			

Course description (Syllabus): Carrying out the training regarding the labor protection norms and presenting the program and the objectives of the practice (one hour for each course); Assisted practice of Sylviculture in the forests nearby Brasov; Assisted practice of Afforestations in the forests nearby Brasov; Assisted practice of Forest Management in different forest departments from ROMSILVA or other owners.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Afforestations II (Afforestations and Ecological Reconstruction)	IMP2	4	2	-	1	1

Course description (Syllabus): General considerations on afforestation works; Species selection and association in afforestation works; Site and soil preparation for afforestation works; Establishment of new forest; Evaluation of afforestation succes rate and maintenance works; The main tree species used for the establishment of production forests; General consideratons on the ecological reconstructon and of forest land; Techniques and technologies used in the ecological restoration of degraded forests; Afforestation in danube and river floodplains; Legal, institutional and finacial framework for the afforestation works.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Wood exploitation II	EXPL1I	4	2			2

Course description (Syllabus): The course targets the knowledge of: methods and technologies in trees extraction process; silviculture – wood exploitation report; wood exploitation planning; wood sorting and wood assortments; wood conservation; wood debris ; evaluation of mechanical trees injuries.

4th Year

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest Land Reclamation	AMEL	6	3		1	2

Course description (Syllabus): The course objectives are: provide basic knowledge regarding the main degradation processes and the degraded lands generated; present and analyse the technical solutions for the degraded lands ecological reconstruction (reclamation measures and works complex) and create the necessary skills for designing and executing them; provide basic knowledge regarding drought and the specific measures and works. By completing the course, the students will be able to: prevent the degradation processes occurrence by using the knowledge regarding their evolution and the influence factors; design the reclamation works and measures assemble; coordinate the execution of the reclamation works; carry out drought control works (shelterbelts).

Main issues: Basic knowledge of hydrology and hydraulics: water cycle, water balance equations and specific coefficients. The runoff and its characteristics. Degradation processes and degraded lands genesis: rainfall erosion, land sliding, wind erosion, salinization, water accumulation, human induced degradation and their consequences. Degraded lands reclamation action and its principles. Degradation processes control and prevention and degraded lands reclamation. Forest reclamation principles. The general study, the degraded lands zoning and the reclamation measures. Degraded Lands Afforestation: Forest Vegetation role in the reclamation action, afforestation types and their peculiarities. Reclamations by grass works: herbaceous vegetation role in the reclamation action, aims and techniques. Soil preparation and improvement works for degraded lands afforestation: Soil preparation works; Fertilisation of soils with nutrient deficiencies; Excessive acid and alkaline soil reaction correction; Polluted and salty soils cleaning; Sandy and clay soils texture improvement. Degraded Lands consolidation works: Ground cleaning and levelling; Eroded hill slopes consolidation; Gully and cliff stabilisation; Gully bottom consolidation works; Landslide stabilisation works; Mobile sands consolidation. Forest Lands Drainage: Drainage definition, forms and necessity -the drainage system. Forest shelterbelts installation on arid lands: Forest shelterbelts definition, forms, necessity. Positioning the shelterbelts for field and communication ways protection. Forest crops irrigation: Irrigation definition, forms and necessity – the irrigation system.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Torrential watershed management II	TOR 2	5	2	-	-	2

Course description (Syllabus): From clasical conception of torrent correction to modern conception of torrential watersheds management. The evolution of preoccupations; Tipology, location, sizing and joining the torrential watersheds management works; Execution and monitoring the torrential watersheds management works; Effects of the torrential watersheds management.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Mechanization of Silvicultural Interventions	MLS	6	3	-	3	-

Course description (Syllabus): The course targets follow the main aspects: In each chapter are analyzed the problems regarding the knowledge of the machinery used nurseries respectively: destination, constructive functional parameters, work processes of active organs, traction resistances and machinery exploitation. The aims are to acquire knowledges regarding the working principles of machinery used in nurseries. The aims are to acquire knowledges regarding the elements and components of machinery used in nurseries. The aim are to acquire knowledges regarding the operations with machinery used in nurseries.

Course title	Code	No of credits	Number of hours per week			
			course	seminar	laboratory	project
Trouts farming	SALMON	5	2		2	

Course description (Syllabus): This course contains the main issues of the mountain river ecosystems, trout and other fish species from mountain rivers and lakes (morphology, spreading, habitat, biology, and ecology), trout rearing farms and the trout rearing technology.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest law and legislation	DLF	4	2		2	

Course description (Syllabus): Basic information about the modalities by which are created the regulations in Romania; Basic information about the property right; The normative system in force for forestry in Romania; The legal tasks and skills of the people involved in the Romanian forestry and forest engineering field.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Trade of Forest Products	COMPF	3	1	-	2	-

Course description (Syllabus): This course addresses the forestry enterprises management challenge of *designing* and *implementing* the best combination of internal organization, market strategies and marketing actions for better market valuing of forest products. Specifically, this course seeks to develop skills in applying the analytic perspectives, decision tools, and concepts of marketing to the following decisions: segmentation and positioning (assessing market potential, analyzing customer behavior, focusing resources on specific customer populations and against specific competitors); product offering (including the breadth of product line, features, quality level, and customer service); pricing (capturing the value created for the customer); distribution channels (the role of distributors, retailers, and other intermediaries); marketing communications (developing an effective balance of advertising, sales promotion, and personal selling). The following main topics are covered by this course: Introductory notions. Demand and supply. Markets; Prices. Tendring for selling/buying wood. SUMAL and traceability of wood. Traceability in Romania – institutional and legal; Valuing the forestry products. Sales techniques. Forestry products marketing. Market research; Non timber forest products: ecotpurism, hunting, other products; Case study: wood products marketing: Munteni Forest District vs. Forestmar Ltd.; Case study: ecotourism and hunting tourism – ROMSILVA.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Photogrametry	FOTO	3	1		1	

Course description (Syllabus): Knowledge frames and stereograms; Obtaining optical model. Determinations on single frames and stereograms; Restitution (recovery) photograms; Applications of photogrammetry in forestry.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Biodiversity conservation and protected areas	CONSBIO	4	2	-	2	-

Course description (Syllabus): Chapter I – Introduction; Chapter II – The problem of human being-nature relationship; Chapter III – The evolution of preoccupations for nature conservation; Chapter IV – Plants and animals protected species. Romanian and Natura 2000 habitats. High Conservation Value Forests; Chapter V – The national network of natural protected areas.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Xylology	XILO	2	1	-	1	-

Course description (Syllabus): Investigation methodology of properties and structure of felled and/or standing trees: sampling, field and laboratory work protocols; Nondestructive methods for wood traits analysis – techniques and applications in wood science; Influencing and control factors in wood formation: annual and seasonal rhythm, eco-physiology; Dendrochronology: research design and applications; Wood as competition technological material: advantages, disadvantages, improvement possibilities, esthetical function.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Wood Processing Technology	TPL	2	1	-	1	-

Course description (Syllabus): The course is divided into three parts referring to: wood resources, wood sorting and timber processing. The first part contains statistical data regarding wood resources available at a certain moment and the factors which may influence it. The second part of the course describes the main wood sorting systems (the industrial and the qualitative one), the criteria which constitute the foundations of wood sorting, the main wood defects and the main measurement techniques for these. The third part, which is the longest, presents the main characteristics of timber and work technique along with timber factories organization and the description of activities characteristic of each compartment.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Application of Genetics in Forestry	AGS	4	2		1	

Course description (Syllabus): The focus of this course is to understand the genetic principles and their application in forest trees species. Main issues to be discussed: Quantitative traits. Heritabilities and genetic correlations. Genetic variation in forest tree populations estimated by means of polygenic traits and genetic markers. Factors promoting genetic diversity in forest tree populations. Genetic implications of silvicultural interventions.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Forest administration	ADMIN	3	1		1	

Course description (Syllabus): Basic information about the forestry administration; Modalities of the organization for the forestry administration in some European countries; The organization of the Romanian forestry administration; The functioning of the organizations making up the Romanian forestry administration; The functional relationships that involve the Romanian forestry administration activities;

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
International Silviculture	SI	3	1		1	

Course description (Syllabus): COURSE OBJECTIVE: The purpose of it is to extand the professional knowledge horizon of the future forestry engineers by knocking down the forestry features of the boreal forests, temperate forests, subtropical and tropical forests and their impact on ecosphere primary production and on the world wood circuit.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Physiological Bases of Forest Ecosystem Production	BFPEF	2	1		1	

Course description (Syllabus): Chapter I : Primary processes in synthesis and degradation of organic substances; Chapter II : Biomass production at trees and stands; Chapter III ; Bioenergetic aspects of productivity; hapter IV : Ecophysiological substantiation of sylvotechnics.