

Transilvania University of Brasov, Romania

Study program: Industrial Economic Engineering

Faculty: Technological Engineering and Industrial Management

Study period: 4 years (bachelor)

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

Course description (Syllabus): numeric series; derivate and differentials; extreme points; integrals; surface and volume integrals.

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

Course description (Syllabus): basic of classical mechanics; oscillatory movement; relativity theory; elastic wave; thermodynamics; electromagnetism; optics; quantic mechanics; atomic physics; solid physics; nuclear physics.

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

Course description (Syllabus): principles of chemistry science; atom characteristics; physical and chemistry bonding; chemical transformation and aggregation states of substances; water; electrolytes; metals; metals and alloys; corrosion; inorganic polymeric materials (glass and ceramics) and organic (polymers of polyaddition and polycondensation).

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Applied software	AS	5	2	-	2	-

Course description (Syllabus): introduction to database; data management; design; implementation; management system database; planning, design and managing database; modelling entity-relationship; database normalization; conceptual design methodology for databases; logical design methodology for database relational model; physical design methodology for relational databases.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Communication management	CM	5	2	2	-	-

Course description (Syllabus): structure of communication processes; theories and models of communications; individual and organizational communication in social environment; techniques of oral communications; communication in social and public environment of companies; recruitment communications; meeting management; conflict settling; research techniques in scientific, economic, administrative; information resources; data bases.

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

Course description (Syllabus): production, trade and services concept; professional/vendors; legal forms of companies; commercial contracts.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Integration and professional development	IPD	2	1	1	-	-

Course description (Syllabus): rules, obligations, regulations, academic writing, timetable

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Computer programming and programming languages	CPPL	5	2	-	2	-

Course description (Syllabus): interface of object oriented programming environment (Delphi); object manager; forms; properties and events; component toolbars; component management; Button, BitBtn, Edit, Memo, ChekBox, MainMenu, TooBar components; dynamic programming; multiform applications.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Technical drawing and info-graphics	TDI	6	3	2		2

Course description (Syllabus): Multiview drawing (view, projection, etc.); views, sections and breaks representation; dimensioning in technical drawing; tolerances and precision; drawing and dimensioning; threads, grooved wedge and grooves, gears; assembly drawing.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Material science and engineering	MSE	4	2	-	1	-

Course description (Syllabus): structure and properties of metallic materials; alloys theory, man type of equilibrium diagrams; Fe-C alloys; thermo-physical and thermochemical treatments for steels; alloyed steels; non-ferrous alloys; extractive metallurgy; moulding, plastic processing; metals welding.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
General economics	GE	4	2	2	-	-

Course description (Syllabus): demand, offer, market, concurrency; labour market, employment, unemployment, wages; monetary market, inflation, loan and interest; capital market; macroeconomics; international economic relations.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Linear algebra, analytical and differential geometry	LAA	5	2	2	-	-

Course description (Syllabus):Linear algebra: vector spaces and subspaces; Euclidian spaces; free vector; vector product; linear transformation in vector spaces; eigenvalues and eigenvectors; diagonalization; liner, bilinear and quadratic forms; Analytic geometry: plan and lines in space; angles; cons; canonical form; quadrics; Differential geometry: plane curves; oscillate circle; tangent; normal; Frenet marker elements; surfaces (generalities; conics; cylindrical, etc.)

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

Course description (Syllabus): Statics: material point; rigid; rigid systems; application in engineering; Kinematics: point; rigid; relative movement; application in engineering; Dynamics theorems; rigid solids.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 1a	ML1a	2	1	1	-	-

Course description (Syllabus): Verb: mood, tense and aspect; indicative mood – present; indicative mood – past; indicative mood – future; modals; Noun: classification, gender, number, case; Adjective: classification, comparison, special constructions, position.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 1b	ML1b	2	1	1	-	-

Course description (Syllabus): Verb: mood, tense and aspect; indicative mood – present; indicative mood – past; indicative mood – future; modals; Noun: classification, gender, number, case; Adjective: classification, comparison, special constructions, position.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 2a	ML2a	2	1	1	-	-

Course description (Syllabus): word order (in declarative/ interrogative/ imperative/ exclamatory sentences); sequence of tenses; reported speech; inversion; negation; complex sentences.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 2b	ML2b	2	1	1	-	-

Course description (Syllabus): pronoun; adverbs; preposition; communication skills.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Physical education and sport	PES01/P ES02	1	-	1	-	-

Course description (Syllabus): practical skills training-methodical composition of complex aerobics; analytical exercises for upper limbs and scapular-humeral belt; exercises for trunk and abdominal muscle; individual actions specific basketball game in attack and defence; elementary collective tactical combinations in attack and defence in basketball; bilateral game. Football: playing without ball; foot hitting; head hitting; strategies; Basketball: techniques; tactical offensive and defensive; contra-offensive; bilateral game.

2nd Year

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Numerical methods	NM	4	2	-	2	-

Course description (Syllabus): mathematical software: Matlab, Mathematica, Maple, Mathcad; introduction in Mathcad; Mathcad programming; vectors and matrixes; numeric solution of equations and equations system; optimizations: nonlinear, mono-objective and multi-objective; multi-attribute decision; interpolation; regression; Monte Carlo method.

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

Course description (Syllabus): financial and accounting statements: balance sheet; profit and loss; companies accounting regime: account and account charts, operating accounts rules; capital accounts; accounting for fixed

assets; stock accounting; treasury accounting; accounting for settlements with third parties; trial balance accounting; activities at the close of financial year.

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

Course description (Syllabus): financial and accounting statements: balance sheet; profit and loss; companies accounting regime: account and account charts, operating accounts rules; capital accounts; accounting for fixed assets; stock accounting; treasury accounting; accounting for settlements with third parties; trial balance accounting; activities at the close of financial year.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Basics of management	BM	4	2	1	-	-

Course description (Syllabus): introduction to management and manufacturing systems; decision; making decisions; participatory management; management organization; planning and control of activity; design of manufacturing systems; investments economic efficiency.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Economic statistics	ES	5	2	2	-	-

Course description (Syllabus): parameters estimation; hypothesis test; product quality control; regressive analysis.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Mechanisms and machine elements 1	MME1	3	2	-	-	1

Course description (Syllabus): general structure of mechanisms: joints; structural modelling of complex mechanisms; structural optimizing of mechanisms; Kinematics and dynamics of: involute gears; planetary gear; linkage mechanisms; cam gear: kinematics. Gears: calculus, forces; shafts; bearings; seals; belt gearing; motor speed control devices; assemblies: screw; shape (keys, studs, grooves, bolts, etc.); friction assemblies; elastic assemblies – springs; couplings.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Strength of materials	SM	4	2	1	1	-

Course description (Syllabus): Fundamentals: mechanical properties of materials; external tensions and constrains; equilibrium equations; Sectional stress: general aspects; differential dependents between forces and sectional stresses; sectional stress diagrams; static and inertial momentum; axial stress; shear stress; bending; elasticity theory.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Economic legislation	EL	4	2	1	-	-

Course description (Syllabus): ending companies: solvent; close-out; commercial bonds; insolvency

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Databases in management	DM	4	2	-	2	-

Course description (Syllabus): introduction to database; data management; design; implementation; management system database; planning, design and managing database; modelling entity-relationship; database normalization;

conceptual design methodology for databases; logical design methodology for database relational model; physical design methodology for relational databases.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Mechanisms and machine elements 2	MME2	3	2	-	1	-

Course description (Syllabus): general structure of mechanisms; joints; structural modelling of complex mechanisms; structural optimizing of mechanisms; Kinematics and dynamics of: involute gears; planetary gear; linkage mechanisms; cam gear: kinematics. Gears: calculus, forces; shafts; bearings; seals; belt gearing; motor speed control devices; assemblies: screw; shape (keys, studs, grooves, bolts, etc.); friction assemblies; elastic assemblies – springs; couplings.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Basics of technology 1	BT1	4	2	-	1	-

Course description (Syllabus): basic elements of the cutting tool; classification and constructive and geometric elements of different cutting tools: lathe tool, drill, reaming tool, drift, broach, milling tool, thread cutting tool, teething tool, abrasive tool; devices: types and design; design of the fixing scheme; principles of modular devices; examples of designing a device for cutting machine tools.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Finances and credit	FC	5	2	2	-	1

Course description (Syllabus): introduction to business finance; balance sheet analysis; analysis on income and loss account; self-financing capacity; breakeven; analysis based on rate method; planning financial activities; short-term management of the enterprise; medium and long term financing of the enterprise; stocks; investment funding; dividends.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Materials technology	MT	3	2	-	2	-

Course description (Syllabus): ferrous and non-ferrous materials; sintered materials; materials resistant to: corrosion, high temperature, low temperature and wear; composites, plastics and adhesives; criteria used in rational choice of materials: a functional, technological and economic criteria; materials and treatments for: axis, bearings, guides, springs and tools.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Marketing	MK	3	2	1	-	-

Course description (Syllabus): Marketing concept; market; company marketing strategies; marketing mix; product and product strategy; price and pricing strategy; distribution and distribution strategy; promotion and advertising strategy.

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

Course description (Syllabus): Marketing concept; market; company marketing strategies; marketing mix; product and product strategy; price and pricing strategy; distribution and distribution strategy; promotion and advertising strategy.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Domain practice (90 hours/ year)	PD	4				

Course description (Syllabus): moulding sectors; hot forming sectors; heat treatment; galvanic coating; welding technologies.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 3a	ML3a	2	-	2	-	-

Course description (Syllabus): quadratic equations; simultaneous equations; indices and logarithms; geometry; trigonometry; functional notations. limits; differentiation; integration; simple harmonic motion; rotation of a rigid body; beyond Newton's law; fields: strength and forces, potential energy.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 3b	ML3b	2	-	2	-	-

Course description (Syllabus): quadratic equations; simultaneous equations; indices and logarithms; geometry; trigonometry; functional notations. limits; differentiation; integration; simple harmonic motion; rotation of a rigid body; beyond Newton's law; fields: strength and forces, potential energy.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 4a	ML4a	2	-	2	-	-

Course description (Syllabus): metals; measurement; design and function; energy, heat and work; control devices; pumps; air-conditioning systems; diesel engines; refrigeration systems; data communications; electric power systems; telecommunications; engineering design; engineering and the Earth's resources.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modern language 4b	ML4b	2	-	2	-	-

Course description (Syllabus): metals; measurement; design and function; energy, heat and work; control devices; pumps; air-conditioning systems; diesel engines; refrigeration systems; data communications; electric power systems; telecommunications; engineering design; engineering and the Earth's resources.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Physical education and sport	PE03/PE04	1	-	1	-	-

Course description (Syllabus): Football: playing without ball; foot hitting; head hitting; strategies. Basketball: techniques; tactical offensive and defensive; contra-offensive; bilateral game.

3rd Year

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Production management	PM	4	2	1	-	-

Course description (Syllabus): management functions; company concept; company environment; company attributes; types of companies; resources raised and use by a company; production management.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Quality management	QM	4	2	-	2	-

Course description (Syllabus): quality; quality engineering; presentation and processing experimental data; quality statistic control; capability analysis; production analysis using control cards; product receiving control; quality assurance costs.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Basics of technological aided design 1	BTAD1	5	2	-	2	1

Course description (Syllabus): coordinate systems; viewing tridimensional drawings; specifying the third dimension; 3D surfaces; 3D polygonal objects; 3D polygonal networks; 3D solid objects, methods for obtaining solid objects; solid editing; representation and obtaining the images for 3D objects.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Nanomaterials and nanotechnologies	NN	5	2	1	1	-

Course description (Syllabus): Nanostructures, nanoparticles, sensors, smart nanomaterials, carbon tubes, nanostructures

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Machine-tools command and driving	MTCD	5	2	-	2	-

Course description (Syllabus): mechanics of industrial machine tools; general electric devices and equipment; three phase asynchronous engine; electric direct current engine; step by step engines and driving; hydraulic driving systems; hydraulic machine tools; hydraulic devices and equipment for commanding and regulating the debit and pressure; hydraulic circuits.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Machining	MAC	5	2	-	2	1

Course description (Syllabus): general notions regarding the material cutting and surface generation; cutting force and specific cutting force; behaviour of different materials during the cutting process; thermic phenomenon in the cutting process; wear and tool life; main cutting processes: turning, milling, drilling, grinding, slotting, shaping, thread processing; roughness of the processed surfaces; processing costs; general notions regarding the numerical control of the cutting process.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Modelling and simulation of economic systems	MSES	4	2	-	1	1

Course description (Syllabus): general aspects regarding modelling and simulation; simulation stages of the manufacturing systems; modelling and simulation of waiting processes; inventory modelling and simulation; fuzzy models; dynamic modelling and simulation; forecasting methods and techniques; modelling and simulation of flexible manufacturing systems.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Basics of technological aided design 2	BTAD2	4	1	-	2	1

Course description (Syllabus): fundamentals of CAD; CAD systems; program interface; drawing editor; coordinates systems; display commands; graphic tools; objects selection; editing and modifying objects; objects properties; dimensioning; hatching; design optimisations; external block and references; text editing; drawing information; drawing plotting.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Tolerances and dimensional control	TCT	4	2	-	1	1

Course description (Syllabus): mechanical instruments for measurement; optical instrument for measurement; limits and fits for cylindrical smooth parts; surface texture measurement; geometric dimensioning and tolerance; tolerances and fits for part threads and fits for gear pairs; tolerances and fits for keys and splines; angle measurements; pneumatic gaging.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Cold forming systems and technologies	CFST	4	2	-	2	-

Course description (Syllabus): introduction in cold forming processing; forming processing with and without material separation; plate sheet processing by forming; plastic forming processing by unconventional methods; machine tools for cold forming; press selection for different forming operations; exploitation of presses and forming machine tools; applications.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Manufacturing machines and equipment	MME	4	2	-	2	-

Course description (Syllabus): structure of manufacturing equipment; manufacturing equipment for cutting processes; processing centres for turning and milling; manufacturing equipment for nonconventional processing; notions regarding rapid manufacturing; performances of manufacturing equipment.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Practice in speciality (90 hours / year)	PS	4	-	-	-	-

Course description (Syllabus): analysis of the product nomenclature of a company; organizational structure of a company and relations among different departments; documents of book keeping; procedures for purchasing and starting of manufacturing; procedures for tracking and monitoring the production process; methods and proceedings for product analysis; organizing goods disposal process; marketing and promotion methods; general notions regarding the investment process; aspects regarding continuous improvement.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Commercial law	CL	3	2	1	-	-

Course description (Syllabus): introduction in commercial law; commerce acts: notions and classifications; traders: notions, categories, professional obligations; trade companies: notions, starting up, working, modifications; dissolution and liquidation of trade companies; commercial obligations; special trade contracts.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Labour law	LL	3	2	1	-	-

Course description (Syllabus): introduction in labour law; labour acts: notions and classifications; basics notions, categories, professional obligations;

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Project management	PM	2	2	1	-	-

Course description (Syllabus): Strategy definitions, components of the strategy, types of strategies, tools and methods, strategic planning, project team, objectives, time schedule, results

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Human resources management	HRM	2	2	1	-	-

Course description (Syllabus): human resource function of the firm; forecasting the human resources within a firm; human resources evaluation; educating, training and development of human resources; labour motivational and performance system; rewarding management system; labour conditions and relations; records and administration of human resources.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Basics of technology 2	BT	3	2	1	-	1

Course description (Syllabus): basic of technological processing of parts in manufacturing industry; general elements of designing the technological processes of mechanical processing; processing accuracy; methods of cutting material removal in cutting process of parts used in manufacturing industry; processing exterior and interior cylindrical and conical surfaces; technology of mechanical processing by cutting using CNC machine tools; aspects regarding economic efficiency of cutting processes.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Machine-tools	MT	3	2	1		1

Course description (Syllabus): design of: lathes; drilling machine-tools; milling machine-tools; finishing machine-tools; boring machine-tools; automation of machine-tools; design of automatic transfer lines; design of aggregate machine-tools; CNC machine-tools; design of processing centres.

4th Year

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Engineering of production systems	EPS	6	2	1	-	2

Course description (Syllabus): manufacturing systems; manufacturing system development; mathematical models of manufacturing; design of manufacturing systems; selection of manufacturing system placement; manufacturing capacity calculus.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Economic analysis	EA	5	2	1	-	1

Course description (Syllabus): introductory notions in economic financial analysis; indicators used in economic financial analysis; analysis of manufacturing and selling activity; human resources analysis; material resources analysis; expenses analysis; profitability analysis; analysis of the financial situation of an enterprise.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Management of logistic activities	MLA	4	2	-	2	-

Course description (Syllabus): logistics, integrating function and competitively factor; logistic activities; product inventory; management of internal transport activity; internal logistics; new approaches regarding the integration of modern concepts of manufacturing administration; trends in the field of logistics and supply chain management.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Industrial design	ID	1	2	-	2	-

Course description (Syllabus): design and development of produced by design, prototyping, shape design, promotion, implementation and exploitation.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Specials systems and technologies	SST	3	2	-	1	-

Course description (Syllabus): technological action of erosion processing; electric erosion processing; electric chemical erosion processing; abrasive materials; abrasive processing by lapping; magnetic abrasive processing; processing by ultrasonic abrasive erosion; processing by pressure fluid flow; modern processing methods by fluid and abrasive suspension processing.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Analysis of investment projects	MIR	5	2	1	-	1

Course description (Syllabus): firm, the main form of organization of a business; introduction in investment process; types of investments; stages of an investment process; strategies for identifying and exploiting financial sources of economic activities; strategic decision: the necessity of correlating the financing decision with investment decision; sources and financing modalities of investments; lending; influence of time upon investment process; components of an investment project feasibility; economical financial appraisal of an investment project; influence of the financing system upon the investment process; appraisal of the decision methods in selecting investment projects.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Intern and international commerce	IIC	3	2	2	-	-

Course description (Syllabus): frame of development and organization of the economic activities in Romania; commercial activity organization and product placement; commercial contracts and commercial negotiation; fundamentals of international commerce; export and import operation; international parts technique; international payment technique; letter of credit; interstate organizational structures; international business ethics.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Computer aided control of manufacturing systems	CMPS	3	2	-	1	-

Course description (Syllabus): synthesis of flexible production systems, decision models in the management of production systems, modelling and simulation of flexible production systems, numerical management of technological processes, CNC programming, programming languages.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Supply management	SM	3	2	-	1	-

Course description (Syllabus): Substantiation of the material supply program, Strategies, principles in material supply, Supplier evaluation, Inventory management and control, MRP material demand planning system, Supply management and sustainable development

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Design of production systems	DPS	4	2	1	-	2

Course description (Syllabus): introduction. quality indicators of determining the manufacturing type; quantitative indicators of determining the manufacturing type; technology selection and preliminary establishing the machine tools by the method of the costs influences by technology and endowment; final establishing of industrial equipment;

selection of tools and devices; determination of manufacturing task; manufacturing systems for mass production; manufacturing systems for series production; manufacturing systems for unique production; assembly systems.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Environment management	EM	4	2	1	-	-

Course description (Syllabus): ecology; environmental protection; sustainable development; environmental management system, scope and requirements; introducing elements of an environmental management; evaluation of environmental performance; environmental audit; life cycle assessment; environmental labels and declarations.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Simulated enterprise	SE	4	1	-	2	-

Course description (Syllabus): Simulated enterprise and simulation, production organization, commercial activity within the simulated company, supply activity within the simulated company, the activity of the accounting-administrative department, sales and marketing activity, elements of financial management

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Diploma project documentation	DPD	4	-	-	-	-

Course description (Syllabus): actual stage and trends in the field of the subject approached by the student; description on the proposed variant (cinematic, constructive technological, organizational solution, or a solution regarding equipment replacement, materials); justification, by calculus, the solution proposed; economic efficiency calculus for the variant proposed; elaboration of the technical economical documentation for the variant proposed; use of computerized methods for developing the final project.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Practice for diploma project	PDP	4	-	-	30	-

Course description (Syllabus): practice for the completion of the diploma project.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Entrepreneurship	ENT	3	2	1	-	-

Course description (Syllabus): concept of entrepreneur and entrepreneurship, forms, typology of entrepreneurship, entrepreneurial environment.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Starting and developing a business	SDB	3	2	1	-	-

Course description (Syllabus): entrepreneur and entrepreneurial activities, market, economic opportunity and business plan, operation and management of the business, stages of establishing a business.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Maintenance of machines and appliances	PCM	2	2	1	-	-

Course description (Syllabus): basics used in the field of maintenance; reliability, maintainability, upkeep, availability; wear of production equipment; maintenance and repair systems; planning and organizing maintenance activities; sizing maintenance and repair facilities; reconditioning; maintenance and quality of products