Study	Level (BA/MA)	Study programme	Study	Semester	Course title and	Credit
domain			year		brief description	units
Mechanical	bachelor, level 6	Mechanical			Mathematical Analysis	5
Engineering	from NQF, EQF	Engineering			Course content:	
					Chapter I. Strings and series of real	
					numbers. Convergence of strings and real	
					number series. Convergence criteria.	
					Head. II. Differential calculus. Real	
					variability of real variable function. Taylor's	
					form. Series of powers. Functions of	
					several variables. Limit, continuity,	
					derivability, and differentiability for multi-	
					variable functions. Partial derivatives of	
					superior order. Extremes free and with	
					links. Elements of field theory (gradient,	
					divergence, rotor). Head. III. Full	
					calculation. Primitive. Methods for	
					determining primitives. Integrala definita.	
					Incorrect integrations. Integral curves of	
					spheres I and II. Integrates the curves	
					independent of the road. Multiple	
					integrations (double, triple, surface).	
					Integer formulas. Chapter IV. Differential	
					Equations. Differential equations of order I:	
					differential equations with separable,	
					nomogeneous, linear variables, Bernoulli,	
					Riccati, Lagrange, Clairaut. Problem of	
					caucity. Thynei Inteal Unterential	
					The content of the seminar or practical	
					nanere.	
			1-st Year	1	Applications to the coursework topics	
			1 01 1001		Chemistry	+
					Course content:	
					1. The History of Chemistry Development	
					Fundamental notions. Classification of	
			1-st Year	1	chemicals. Aggregation states of matter.	5

		Status Transformations. 2. Fundamental	
		Laws of Chemistry. Elements of structure	
		of atoms. 3. Atomic models. Orbital	
		atomic. Quantum numbers. Electronic	
		layers. Electronic substrates. Periodic	
		system of elements. 4. Law of periodicity	
		and properties of elements. Rules for	
		setting oxidation numbers. Electronic	
		configurations of atoms. Chemical	
		connections. The ionic bond. 5. Chemical	
		bonds. The covalent bond. Coordinative	
		link. Metal bond. Intermolecular links. 6.	
		Disperse systems. Classification of	
		solutions. Modes of expression of solution	
		concentrations. Solutions Laws.	
		Suspensions. Colloidal systems. Acid-	
		base reactions (neutralization reactions).	
		PH indicators. Balances in salt solutions.	
		7. Redox reactions. Types of redox	
		reactions. Series of redox activity.	
		Galvanic cells. Electrolysis. The laws of	
		electrolysis. Applications of electrolysis.	
		Precipitation reactions. Complexity	
		reactions. 8. HYDROGEN. Natural state.	
		Obtaining. Physical and chemical	
		properties. Use. METALS. Natural state.	
		General methods of obtaining and	
		purifying metals. General physical	
		properties of metals. General chemical	
		properties of metals. Alloys. 9. Group 1 of	
		the Periodic System. General	
		characterization of the element and	
		combinations of Group IA elements.	
		Natural state. Obtaining. Physical and	
		chemical properties. Main combinations.	
		Uses. Group 2 of the regular system.	
		General characterization of elements and	
		combinations of Group IIA elements.	

		Natural state. Obtaining. Physical and	
		chemical properties. Main combinations.	
		Uses. 10. GROUP 13 of the Periodic	
		System. General characterization of	
		elements and combinations of elements in	
		Group IVA, ALUMINUM: Natural condition.	
		Obtaining. Physical and chemical	
		properties. Main combinations. Uses.	
		Group 14a (IVA) of the Periodic System	
		General characterization of elements and	
		combinations of elements in Group IVA	
		Carbon and Silicon Natural state	
		Allotropic forms Obtaining Physical and	
		chemical properties Main combinations	
		Uses 11 GROUP 15 of the Periodic	
		System General characterization of	
		elements and combinations of elements in	
		group VA Nitrogen and Phosphorus:	
		Natural state Allotropic forms Obtaining	
		Physical and chemical properties Main	
		combinations Uses Group 16 of the	
		regular system General characterization	
		of elements and combinations of Group VI	
		elements A Oxygen and Sulfur: Natural	
		state Allotronic forms Obtaining Physical	
		and chemical properties Main	
		combinations Uses 12 GROUP 17 of the	
		Periodic System General characterization	
		of elements and combinations of elements	
		of group VII A CLOR: Natural state	
		Obtaining Physical and chemical	
		properties Main combinations Uses	
		GROUP 18th Bare gases (noble) Style	
		natural Obtaining Physical and chemical	
		properties Main combinations Uses 13	
		Transitional metals: Groups III B - VII B	
		General characterization Important	
		combinations Uses Group VIIIR (groups	
		Combinations. Uses. Group vind (groups	

			8, 9, 10). Fe, Co, Ni: General characterization. Natural state. Methods of obtaining. Physical and chemical	
			characterization. Natural state. Methods of	
			obtaining. Physical and chemical	
			properties. Group II uses B. General	
			characterization. Natural state. Methods of	
			obtaining. Physical and chemical	
			The content of the seminar or practical	
			works:	
			1. Labor protection in the chemistry lab.	
			Presentation of laboratory work. 2. Modes	
			of expression of solution concentrations	
			(c%, n, m, t, f). Troubleshooting modes. 3.	
			Ways to solve chemistry problems.	
			Applications. 4. Introductory notions in	
			measurement Titration 5 Alkalimetry:	
			Determination of titre factor and normality	
			of NaOH solution $\sim 0.1$ N. 6. Acidimetry:	
			Preparation of 0.1N HCI solution.	
			Determination of titre, factor and normality	
			of HCl solution ~ 0.1N. 7.Determination of	
			water hardness 8.Gravimetry. Fe Fe in	
			oxide form. 9.Measures to solve chemistry	
			problems. Applications. 10. Introductory	
			Analytical classification of cations and	
			anions Preliminary analysis of cation	
			dosing. 11. Recognition of Group V	
			cations. 12. Recognition of Group Anions.	
			I. Recognition of Group II Anions.	
			Recognition of Group III anions.	
			13.Measures to solve chemistry problems.	
			Applications. 14. Laboratory colloquium	
	1-st Year	1	Communication	5

			Communication, principles, units and	
			characteristics of communication; the	
			effects of communication, the intelligibility	
			of the message: levels of human	
			communication. The principles of effective	
			communication: clear complete concise	
			concrete fair recentive courteous	
			message Nonverbal communication	
			Communication networks Communication	
			in conflict management. Communication	
			and listoning. Dresentation of techniques	
			and listening. Presentation of techniques	
			for making oral and written scientific	
			presentations. Formats for presentations.	
			Organization of the presentation. Data	
			integration. Media elements. Structure of	
			technical-scientific works: papers, studies	
			completion, papers and scientific papers,	
			projects. Human-to-human interaction	
			mediated by web and audio-video	
			technologies.	
			Sports	
			The content of the seminar or practical	
			works:	
			1. Presentation of minimal theoretical	
			content regarding the activity of physical	
			education, training for labor protection,	
			presentation of the objectives and	
			requirements of the discipline support of	
			the initial tests 2 Repeat the main	
			methods of football - girls and volleyball	
			dirla known from provious evelos	
			Bositioning in attack and defense avetome	
			Positioning in attack and detense systems.	
			Dilateral games. Developing the rectifying	
			rate to auditory and visual stimuli. Repeat	
			KICK Start and launch from start,	
			aevelopment of the speed of movement	
			through accelerators on variable distances	
	1-st Year	1	20-60m. Educating dynamic strength in	2

			upper, lower limbs, abdomen and trunk by	
			working in the circuit and by working on	
			workshops. 3. Evaluation with specific	
			scores, the level of movement speed	
			development and segmental muscle	
			strength. 4. Presentation of the topic	
			approached in semester 2. Readiness to	
			effort. Sports Games, 5. Strengthen the	
			main elements and technical procedures	
			specific to sports games. Their repetition	
			in adversity, in a bilateral game.	
			Developing the elements of coordinating	
			capacity - rhythm, precision, static and	
			dynamic balance, spatio-temporal	
			orientation, combination of movements,	
			kinesthetic discrimination,	
			ambidextructure, agility. Education of	
			aerobic and mixed resistance by the	
			method of uniform and variable efforts. 6.	
			Evaluation with specific evidence, the level	
			of development of resistance and the	
			degree of mastery of a sports game.	
			Physics	
			Course content:	
			Elements of physical mechanics Statics	
			and dynamics of fluids. Oscillations and	
			elastic waves. Elements of molecular	
			physics. Thermodynamic elements.	
			Elements of quantum mechanics, atomic	
			and nuclear physics.	
			Content of seminar or practical works:	
			Processing of experimental data. Electrical	
			and magnetic methods. Methods for	
			determination of the propagation velocity	
			of waves. Methods of temperature	
			determination. Determination of liquid	
			viscosity. Determination of density and	
	1-st Year	1	superficial tension. Experiments in atomic	1

			physics. Problems related to the chapters	
			studied at the course.	
			Descriptive Geometry	
			Course content:	
			Chapter 1. Projection systems: Conical	
			projection, cylindrical projection, quoted	
			projection. Chapter 2. Representation of	
			the point, the straight and the plane: The	
			representation of the point in space and in	
			the purge in the double and triple	
			orthogonal projection. Representation of	
			the straight into space and purge, simple	
			straight and double particular, relative	
			positions of the two straight. The	
			representation of the plane in space and in	
			the purge, the right and the point	
			contained in the plane, the particular	
			straight lines contained in the plan, the	
			simple and double particular plane, the	
			relative position of the two planes, the	
			relative positions of a straight to a plane,	
			the straight and the plane perpendicular,	
			purge. Head. 3. Polyhedra: Definition,	
			classification, representation of polyhedra.	
			Polyline flat sections. Intersection of	
			polyhedra with right. Deploying polyhedra.	
			Head. 4. Cylinder and cone: Definition,	
			classification, representation of cylindrical-	
			conical bodies. Flat sections with	
			cylindrical conical bodies. Intersection of	
			cylindrical-conical with right. Deploying the	
			cylinder and cone. Head. 5. Sphere:	
			Sphere representation, points on the	
			sphere, plane tangent to the sphere, plane	
			spheres through the sphere, intersection	
			of a straight with a sphere, unfolded to the	
			sphere. Head. 6. Intersections of	
	1-st Year	1	geometrical bodies: Polyhedral	5

			intersections, intersections of cylindrical-	
			conical bodies, cone and cone	
			intersections with cone and cylinder	
			The content of the seminar or practical	
			works:	
			1.Applications to the representation of the	
			point, the right and the plane: The	
			representation of the point in space and in	
			the purge, in the double and in the triple	
			orthogonal projection; representation of	
			straight and double private straight lines,	
			determination of traces and crossings	
			crossed by the right, intersections of	
			planes and plates, visibility in the purge. 2.	
			Applications in the Polyhedra chapter: The	
			intersection of some particular planes with	
			pyramid and prism, straight intersections	
			with prism and pyramid, prism and	
			pyramid deployments. 3. Applications in	
			the chapter cylinder and cone: The	
			intersection of any planes and particular	
			planes with the cone and the cylinder, the	
			intersections of straight with the cylinder	
			and the cone, the rollers of the cylinder	
			and the cone. 4. Sphere applications:	
			Sphere intersection with particular plane	
			and planar plane, the intersection of the	
			straight line with the sphere, unfolded to	
			the sphere. 5. Applications in the	
			intersection of geometric bodies:	
			Intersections of polyhedres, intersections	
			of cylindrical-conical bodies, intersections	
			of sphere with cone and prism.	
			English	
			Course content:	
			Communication, principles, units and	
			characteristics of communication; the	
	1-st Year	1	effects of communication, the intelligibility	5

			of the message; levels of human	
			communication. The principles of effective	
			communication: clear, complete, concise,	
			concrete, fair, receptive, courteous	
			message. Nonverbal communication.	
			Communication networks. Communication	
			in conflict management. Communication	
			and listening. Presentation of techniques	
			for making oral and written scientific	
			presentations. Formats for presentations.	
			Organization of the presentation. Data	
			integration. Media elements. Structure of	
			technical-scientific works: papers, studies	
			completion, papers and scientific papers,	
			projects. Human-to-human interaction	
			mediated by web and audio-video	
			technologies.	
			The content of the seminar or practical	
			works:	
			Technical and business correspondence.	
			Design and drafting CV (European	
			format). Letter of intent. Interview	
			selection, employment, promotion on the	
			job. Oral and written presentations.	
			Technical and scientific works: papers,	
			studies completion, papers and scientific	
			papers, projects.	
			Materials Science and Engineering	
			Course contents:	
			Introduction. Types of materials. The link	
			between chemical composition-processing	
			conditions-property structure. Atomic	
			architecture. Crystalline structure,	
			crystalline imperfections. The amorphous	
			structure. Diffusion. Diffusion laws.	
			Solidification of metallic materials. Alloy	
			systems. Diagram of phase equilibrium.	
	1-st Year	1	Fe-C alloy system. Transformations of	2/5

			solid state phases. Thermal treatments;	
			Non-ferrous alloys. Aluminum and copper;	
			Ceramic materials. Plastic materials.	
			Composite materials	
			The content of the seminar or practical	
			works:	
			Metalographic Microscope, Research on	
			the structure of materials by optical	
			microscopy Sample preparation for	
			exaggeration to the ontical microscope	
			Macroscopic analysis of metallic materials:	
			Determination of non-metallic inclusions in	
			steels Quantitative structural	
			determinations Structural constituents in	
			motallia materials: The Ee Ee2C system	
			Carbon and white steal steals. Fo graphite	
			Carbon and while steel steels. Fe-graphile	
			deformed steels. Structure of thermally	
			treated steels. Structure of thermally	
			ireated steels. Structure of thermo-	
			chemically treated steels. Structure and	
			properties of weided joints. Structure of	
			Allied Steels. Structure of non-ferrous	
			alloys. Plastics, structure and properties.	
			Structure of ceramic and composite	
			materials.	
			Linear Algebra, Analytic Geometry and	
			Differential	
			Course contents:	
			Cap. I. Matrices, determinants. Systems of	
			linear equations. Assembling and	
			multiplying two matrices, calculating the	
			determinant of a matrix, inverse of a	
			matrix. Solving systems of linear	
			equations. Head. II. Vector spaces. Space	
			and vector subspace. Linear variety.	
			Addiction and linear independence. Base	
			and size. Changing the coordinates of a	
	1-st Year	2	vector when changing the base. Head. III.	5

		Linear Applications. Definition of a linear	
		application, examples, properties, image	
		and kernel, associated matrix.	
		Isomorphism of vector spaces. Own	
		vectors and own values. Diagonalization of	
		a matrix. Head. IV. Functional linear.	
		bilinear, square, Definition, matrix	
		attached, canonical expression of a	
		square functional Head V Euclidean	
		vector spaces. Scalar product, norm,	
		angle, projections. Ortonormate bases.	
		Orthorhombic procedures. Head. VI. Free	
		vectors. The notion of free vector and	
		bound vector. Vector space of free	
		vectors. Scalar product, vector product,	
		mixed product, double vector vector of free	
		vectors. Head. ARE YOU COMING. Plan	
		and right in E3. Cartesian landmark,	
		coordinate systems in space and plan.	
		Changing the landmark. Equations of the	
		plan. Distance from one point to a plane.	
		Relative positions of two planes, planar	
		beam. Types of equations of a straight line	
		in E3. Relative positions of two straight	
		lines; competition and common	
		perpendicular, point of intersection. The	
		distance between two straight lines.	
		Relative positions of the plane and the	
		straight. Orthogonal projections. The	
		symmetry of a point towards a plan,	
		respectively face o right. Head. VIII.	
		Cuadra. Sphere: sphere definition, sphere	
		determination by given conditions.	
		Intersection of the sphere with a plane.	
		Intersection of the sphere with a right.	
		Tangent, plane tangent to a sphere.	
		Cuadrices on reduced equations: ellipsoid,	
		hyperboloid, paraboloid, cylinder, con.	

			Head IX Elements of Differential Curve	
			Theory Analytical representation of plana	
			curves and space. Parameterization by are	
			length Calculate the length of a curve are	
			Frenct's formulas, surveture and tersion of	
			Frenet's formulas, curvature and torsion of	
			a curve. Freners class. Geometric	
			Con X Elemente of ourfood differential	
			Cap.A. Elements of surface differential	
			theory. Analytical representation of	
			surfaces; plane tangent and normal to a	
			surrace; calculating arc lengths of the	
			curve and angles between two curves	
			located on a surface. The first and second	
			tundamental form of a surface; surface	
			orientation. Cylindrical conical surfaces.	
			Rotating surfaces.	
			The content of the seminar or practical	
			papers:	
			Applications to the coursework topics.	
			(students will learn to use the lessons	
			studied at the course to solve problems	
			related to course topics.)	
			Drawings and Infographics I	
			Course content:	
			C1- Rules for drawing STAS 6134-84; C2 -	
			Inscription of the precision elements of the	
			execution; dimensional tolerances STAS	
			ISO406-91, adjustments; geometric	
			tolerances SR EN ISO 7083-2002; STAS	
			7385 / 1,2-1985; STAS 7391 / 1,2,3,4,5-	
			76; C3 - Representation and quotation of	
			STAS 5013 / 1,2,3,4-82 toothed wheels;	
			C4- Representation of gears SR EN ISO	
			2203-2002; C5- Demountable assemblies:	
			threaded assemblies, feather assemblies;	
			Slot assemblies SR EN ISO 6413-1997	
			elastic fittings SR EN ISO 2162 / 1.2-1997	
	1-st Year	2	C6 - tree representation: drawing the	4
			2203-2002; C5- Demountable assemblies: threaded assemblies, feather assemblies; Slot assemblies SR EN ISO 6413-1997; elastic fittings SR EN ISO 2162 / 1,2-1997.	
	1-St Teal	2	100 - tree representation, drawing the	4

		execution drawing for a tree: C7 -	
		Representation of sliding bearings and	
		rolling bearings STAS 8953-85; SR EN	
		ISO 8826 / 1.2-2002: C8- Representation	
		of elements and sealing devices SR ISO	
		9222 / 1 2-1994: C9-C10-Representation	
		of non-demountable assemblies: welded	
		assemblies SR EN 22553-1995 and	
		riveting assemblies: C11- Rules for the	
		drawing of metal constructions STAS	
		11624 82: C12 Drawing rules for civil	
		appartuation SP EN ISO7519 2002: C12	
		Drowings of installation drowings: Symbols	
		SR EN 150 6412 / 1,2,3-2002, C14-	
		Representation of kinematic schemes;	
		Symbology.	
		Content of seminar of practical works:	
		L1 - 4 hours Representation of hanges and	
		threads. Threaded threads and threads	
		SR ISO6410 / 1,2,3-1995. (Teaching +	
		planing) - / LP1L2 - 4 nours - Drawings of	
		some parts by means of revealing (cap,	
		gear pump body); tolerances and	
		roughness SR RN ISO 1302-2002 - / LP2	
		/ 1,2, L3 - 40re - finishing LP2 L4 -4 nours-	
		Execution drawings for sprockets in a	
		toothed wheel assembly (cylindrical gear	
		pump) representation of centering noies	
		SR EN ISO 6411: 2001. Applications to	
		STAS 5013 / 1,2, -82, SR EN ISO 2203-	
		2002. LP3 / 1.2 L5, 6 - 8 nours Gear	
		snapes: cylindrical, conical, worm	
		gears.LP4 / 1,2,3; L7-4 hours Compact	
		gear pump design; LP5; L8-4 hours	
		Overall design for a conical gearbox; the	
		design drawing of a conical wheel STAS	
		5013 / 3-82 and the marking of heat	
		treatment stas 7650-89. LP6 / 1.2; L9-4	

			hours Readings: Overall drawing for a	
			cylindrical, worm gear reducer; Extraction	
			of details and representation of:	
			assembled assemblies - threaded	
			assemblies feathers STAS 1004-81	
			1007.91 $1012.77$ grooved and electic	
			CD EN ICO CAA2 4007, CD EN ICO 2402 /	
			SR EN ISO 6413-1997; SR EN ISO 21627	
			1,2-1997 - LP7;	
			Sports	
			The content of the seminar or practical	
			works:	
			1. Presentation of minimal theoretical	
			content regarding the activity of physical	
			education, training for labor protection	
			presentation of the objectives and	
			requirements of the discipline support of	
			the initial tests 2 Repeat the main	
			methode of football girls and volloyball	
			dirlo known from provious ovelos	
			gins, known non previous cycles.	
			Positioning in attack and defense systems.	
			Bilateral games. Developing the rectifying	
			rate to auditory and visual stimuli. Repeat	
			kick start and launch from start,	
			development of the speed of movement	
			through accelerators on variable distances	
			20-60m. Educating dynamic strength in	
			upper, lower limbs, abdomen and trunk by	
			working in the circuit and by working on	
			workshops, 3. Evaluation with specific	
			scores the level of movement speed	
			development and segmental muscle	
			strongth 4 Procontation of the tania	
			approached in composter 2 Dectiness to	
			approached in semester 2. Readiness to	
			errort. Sports Games. 5. Strengthen the	
			main elements and technical procedures	
			specific to sports games. Their repetition	
			in adversity, in a bilateral game.	
	1-st Year	2	Developing the elements of coordinating	5

				1
			capacity - rhythm, precision, static and	
			dynamic balance, spatio-temporal	
			orientation, combination of movements,	
			kinesthetic discrimination,	
			ambidextructure, agility. Education of	
			aerobic and mixed resistance by the	
			method of uniform and variable efforts. 6.	
			Evaluation with specific evidence, the level	
			of development of resistance and the	
			degree of mastery of a sports game.	
			Electrotechnics	
			Course content:	
			1. General Electrotechnics: DC Electric	
			Circuits: Printed Electrical Fields.	
			Electricity. The Law of Electric Driving.	
			Law of energy transformation into	
			conductors. Kirchhoff's theorems.	
			Resolving DC circuits. The balance of	
			powers. Maximum power transfer.	
			Theorem of power conservation in DC.	
			Electromagnetism: The magnetic field.	
			Magnetic induction. Magnetic Field	
			Intensity. The magnetic flux. Magnetisation	
			of bodies. The hysteresis phenomenon.	
			The fundamental law of the magnetic	
			circuit. The phenomenon of	
			electromagnetic induction. Autoinducer.	
			Mutual induction. Eddy currents	
			(Foucault). The magnetic field energy.	
			Electromagnets. Single-phase alternating	
			current circuits: Single-phase alternating	
			current generation. Characteristic	
			dimensions of the single-phase alternating	
			current. Symbolic representation of	
			sinusoidal sizes. Laws and theorems in	
			c.a. AC Circuit Elements. Series circuits	
			and alternating current. Power in c.a.	
	1-st Year	2	phase. Improving the power factor.	1

Resonance in electrical circuits. Three-	
phase electric circuits: Polyphase	
systems. Three-phase systems. Star	
connection. Triangle connection. Electrical	
powers in three-phase circuits. Connecting	
the receivers in three-phase electrical	
networks. Connect in star, connecting in	
the triangle. Electrical Measurement:	
Classification of Electrical Measurement	
Devices, General notions of metrology.	
Constructive Principles of Measuring	
Devices Analogue measuring	
instruments. Measurement of current	
intensity. Measurement of voltages.	
Resistance measurement. Measurement	
of active and reactive DC and single-	
phase and three-phase powers.	
Measurement of active and reactive DC	
and single-phase and three-phase	
energies. Measurement of impedances	
(inductances and capacities).	
Measurement of power factor. Frequency	
measurement. 2. Electric Machines:	
Electric Transformers: Single-Phase	
Transformer. Constructive elements.	
Principle of operation. Operation of the	
single-phase transformer. Functioning in	
pregnancy. Single-phase transformer	
vield. Three-phase transformers.	
Autotransformer, Welding transformers,	
Transformers for electric arc furnaces.	
Asynchronous machines: Construction	
elements of the three-phase asynchronous	
machine. Motor operation of the	
asynchronous machine. Electromagnetic	
torgue of the asynchronous machine.	
torque of the asynchronous machine. Characteristics of three-phase	

			phase asynchronous motor. Adjusting the	
			speed and reversing the rotation direction.	
			Single-phase asynchronous motor.	
			Synchronous machine: Construction	
			principles of the three-phase synchronous	
			machine Operation of the synchronous	
			machine as a generator Characteristics of	
			the synchronous generator Parallel	
			operation of synchronous generators	
			Synchronous engine operation and	
			characteristics Starting the three-phase	
			curchronous motor DC machino:	
			Construction of the c.c. Operation of the	
			construction of the c.c. Operation of the	
			the end with independent excitoment and	
			derivation. Characteristics of the e.e. with	
			carial evoltement. Characteristics of the	
			serial excitement. Characteristics of the	
			the end in angine mode. Speed and targue	
			of the engine tergue. Engine features of	
			of the engine torque. Engine realties of	
			derivation Engine features of a with	
			derivation. Engine realures of c.c. with	
			serial excitement. Engine leatures of c.c.	
			with mixed excitement. The losses and the	
			Contant of the cominer or prestical	
			Content of the seminar or practical	
			Strength and neuron in DC	
			Strength and power in DC.	
			2. Own inductivities, mutualities and	
			capabilities. 3. Series circuits and current	
			derivation Alternative. 4. Power in AC	
			circuits. Improving power factor. 5. Single-	
			phase transformer. I race the transformer	
			characteristics. 6. Asynchronous engine	
			study. 7. Diesel engine study	
			English	
			The content of the seminar or practical	
	1-st Year	2	works:	5

			Semester I - Production Specialized	
			vocabulary and discourse situations	
			Grammar in focus: Procent tancas	
			(procent simple procent continuous	
			present simple, present continuous,	
			Development Cresielized vessbylery and	
			Development, Specialized vocabulary and	
			discourse situations.) Grammar in focus:	
			Past tenses (past simple, past continuous,	
			past perfect). Grammar in focus: Future	
			forms, Logistics, Specialized vocabulary	
			and discourse situations, Grammar in	
			focus: Conditionals, Quality, Specialized	
			vocabulary and discourse situations,	
			Grammar in focus: Verb phrases. Focus:	
			Verb phrases - Assessment test -	
			Semester II - Engineering - Specialized	
			vocabulary and discourse situations -	
			Grammar in focus: Active versus Passive -	
			Relative clauses - Automotive -	
			Specialized vocabulary and discourse	
			situations discourse situations Grammar	
			in focus: Obligation and requirements	
			vocabulary and discourse situations	
			Grammar in focus: Cause and effect	
			Construction Specialized vecabulary and	
			discourse situations. Crommer in focus:	
			Ability and inchility. Accomment text	
			Ability and inability. Assessment test.	
			Course content:	
			Recapitulative notions about vector	
			operations, principles and	
			the axioms of mechanics. Moments	
			theory: Moment of force in relation to a	
			point and an axis; Central Axis Reduction	
			Cases; Reducing particular systems of	
			forces; Center of Parallel Forces. Static	
			moments and centers of gravity, Guldin's	
	1-st Year	2	theorems. Equilibrium of rigid subject to	2/5

•				
			ideal bonds, types of bonds. Methods and	
			theorems in statics of material systems:	
			Element isolation method; Method of	
			solidification; Method of isolating parts.	
			Beam beams. Rubbing in the technique:	
			Rubbing; Rolling friction; Pivoting rubbing;	
			Rubbing in joints and bearings. Static of	
			varns: General equation of varns: Wire	
			rubbing. Applications in static technique:	
			Parga and inclined plane: Scrapers and	
			pullev systems: Even the screw: Brake	
			band brake and sabot brake. Point	
			Cinematic: Coordinate Systems: Speed	
			and acceleration: Particular moves of the	
			point.	
			The content of the seminar or practical	
			works:	
			S1 - Introduction - vector operations.	
			Applications, S2 - Moment of force relative	
			to a point and an axis. Applications, S3 -	
			Reduction of force systems, center axis,	
			reduction cases. Applications, S4 - Table	
			Centers Applications S5 - Equilibrium of	
			the rigid subject to ideal bonds	
			Applications S6 - Statics of material	
			systems Applications S7 - Friction	
			systems Applications	
			Computers Programming and	
			Programming Languages	
			Objectives:	
			Understanding the basic concepts of	
			structure programming and building the	
			skills needed to design advanced	
			applications Knowing the facilities of a	
			modern programming environment	
			Developing and testing some C language	
			annlications	
	1-st Vear	2	Course Content	5
	1 31 1001	<b>~</b>		5

			Representation of information in numerical computers, numbering systems, alphanumeric codes, numeric codes. Algorithms and logic schemes, pseudocode language. Fundamental algorithms. Language C, introduction. Instructions. Types Input / Output Functions. Operators and phrases. Panels. <b>Application Content</b> Numerical systems: binary, octal, hexadecimal. Convert numbers from one counting system to another. Numeric codes. Representation of numbers in complement to 2. Sorting and intercalating algorithms. Fast search algorithms. Application for displaying integer values with words. Application for graphic representation of trigonometric functions over a certain range. Representing surfaces in space. Application for adding and subtracting numbers as large as possible. Show contents of whole variables in binary format. Duplicate elimination application in a text. Define some exceptions. Remove a specific word	
			some exceptions. Remove a specific word from a text. Sorting and fast search applications.	
	1-st Year	2	Materials TechnologyCourse contents:Structure of materials. Crystallinestructures. Types of metal-specificcrystallinestructures. CrystalimperfectionsDeformation in metalliccrystals.Deformation of polycrystallineaggregates.AmorphousMechanicalpropertiesResistanceandplasticity.Variation	4

		conventional voltage R with specific	
		deformation e. Voltage variation s with	
		deformation degree e. Rational curve.	
		Elongation at break. Tackle at break.	
		Hardness. Determination of Brinell	
		hardness. Determination of hardness by	
		Vickers method. Rockwell Hardness	
		Determination. Resilience. Influence of	
		temperature on material properties. Fluid	
		properties. Visco-elastic behavior of	
		polymers. Physical Properties of Materials.	
		Density. Thermal expansion. Melting	
		properties. Specific heat and thermal	
		conductivity. Diffusion. Resistivity and	
		conductivity. Electrochemical processes.	
		Processing of metallic materials. Obtaining	
		metallic nanostructures through Several	
		Deformation Processing. Processing	
		sheets and bands. Welding of metallic	
		materials. Overview of welding technology.	
		Physics of welding. Structure of welded	
		joints. Solderability of metallic materials.	
		Arc welding. Arc welding arc. The arc	
		welding technology. Welding under flow	
		layer. Welding in the protective gas	
		environment. Welding in a slag bath.	
		Aluminotermic welding. Welding by	
		pressing and heating by contact electrical	
		resistance. Plasma welding. Coating and	
		deposition processes. Electrodeposition.	
		Physical and chemical deposits. Organic	
		coatings. Ceramic coatings. Coatings by	
		thermal and mechanical processes.	
		Bottling of bottles. Raw materials used in	
		the manufacture of bottles. The process of	
		manufacturing glass. Processing of	
		ceramic materials and ceramics.	
		Processing of plastics. Rubber processing.	

			Processed Integrated Circuits Silicon	
			processing Lithography Thermal	
			oxidation Chemical deposition in the	
			vapor state Integrated circuits	
			encansulation	
			Content of the seminar or practical	
			worker	
			Dresentation of the laboratory SSM and	
			Presentation of the laboratory, SSW and	
			specific SU; The hardness attempt.	
			Traction test. Bending on shock. The	
			properties of the formation mixtures.	
			Formation in two frames with classic	
			mixture and gravitational casting. Forging,	
			forging operations, forging in molds,	
			molding of liquid metal. Rolling, lamination,	
			rolling friction coefficient, variation of	
			lamination coefficients with deformation	
			degree. Extrusion.	
			Processing by severe plastic deformation	
			in order to obtain materials with ultrafine	
			structure. Welding with manual and	
			automatic arc under flow layer. Welding by	
			pressure and heating by its own strength.	
			Welding with oxyacetylene flame. Flame	
			cutting.	
			Drawings and Infographics II	
			Course content:	
			AutoCAD - Overview. Basics for Drawing.	
			Enter text into graphic files. Orders for	
			multiplying objects. Tentative notions.	
			Polylines. Editing commands Advanced	
			Drawing commands. 3D drawing	
			commands: nonprimitive. 3D drawing	
			commands: primitive. 3D editing	
			commands Preparation of product	
			technical documentation	
			The content of the seminar or practical	
	2-nd Year	1	works	3

			The second secon	
			Using basic drawing commands in	
			AutoCAD and editing completed drawings.	
			Quotation of drawings executed in	
			AutoCAD. Use advanced drawing	
			commands in AutoCAD. 3D modeling:	
			drawing, editing. Preparation of product	
			technical documentation.	
			Sports	
			The content of the seminar or practical	
			works:	
			1. Presentation of minimal theoretical	
			content regarding the activity of physical	
			education, training for labor protection,	
			presentation of the objectives and	
			requirements of the discipline, support of	
			the initial tests. 2. Repeat the main	
			methods of football - girls and volleyball	
			girls, known from previous cycles.	
			Positioning in attack and defense systems.	
			Bilateral games. Developing the rectifying	
			rate to auditory and visual stimuli. Repeat	
			kick start and launch from start,	
			development of the speed of movement	
			through accelerators on variable distances	
			20-60m. Educating dynamic strength in	
			upper, lower limbs, abdomen and trunk by	
			working in the circuit and by working on	
			workshops. 3. Evaluation with specific	
			scores, the level of movement speed	
			development and segmental muscle	
			strength. 4. Presentation of the topic	
			approached in semester 2. Readiness to	
			effort. Sports Games. 5. Strengthen the	
			main elements and technical procedures	
			specific to sports games. Their repetition	
			in adversity, in a bilateral game.	
			Developing the elements of coordinating	
	2-nd Year	1	capacity - rhythm, precision, static and	3

	dynamic balance spatio-temporal	
	orientation combination of movements	
	kinesthetic discrimination	
	ambidextructure agility Education of	
	ambidexilideale, aginty. Education of	
	aerobic and mixed resistance by the	
	method of uniform and variable efforts. 6.	
	Evaluation with specific evidence, the level	
	of development of resistance and the	
	degree of mastery of a sports game.	
	English	
	The content of the seminar or practical	
	works:	
	Semester I - Production. Specialized	
	vocabulary and discourse situations.	
	Grammar in focus: Present tenses	
	(present simple, present continuous,	
	present perfect. Research and	
	Development, Specialized vocabulary and	
	discourse situations) Grammar in focus	
	Past tenses (nast simple nast continuous	
	nast perfect) Grammar in focus: Euture	
	forms Logistics Specialized vocabulary	
	and discourse situations. Grammar in	
	focus Conditionale Quality Specialized	
	locus. Conditionals, Quality, Specialized	
	vocabulary and discourse situations,	
	Grammar in focus: verb phrases. Focus:	
	Verb phrases - Assessment test -	
	Semester II - Engineering - Specialized	
	vocabulary and discourse situations -	
	Grammar in focus: Active versus Passive -	
	Relative clauses - Automotive -	
	Specialized vocabulary and discourse	
	situations. discourse situations. Grammar	
	in focus: Obligation and requirements	
	vocabulary and discourse situations.	
	Grammar in focus: Cause and effect.	
	Construction. Specialized vocabulary and	
0.11/1.1		<b>^</b>

			Ability and inability. Assessment test.	
			Machine-Tools and Cutting Processing	
			Course content:	
			Elementary notions about surface	
			generation on machine tools. General	
			considerations. The kinematics of	
			generation. Generating curve: definition,	
			materialized generators, kinematic	
			generators resulting as a trajectory of a	
			point or as a winding of a curved family,	
			programmed generators. Directional	
			curve: definition, materialized directories	
			and kinematic directories. Basic notions of	
			the theory of cutting and cutting tools.	
			Construction of cutting tools. Geometry of	
			cutting tools. Sharpening. Cutting forces.	
			Heat sources and heat balance of the	
			cutting process. Wear cutting tools; wear	
			criteria. Durability of cutting tools. Cutting	
			parameter parameters: speed, feed, depth	
			of cut. The kinematic chain theory.	
			Mechanism: definition, transfer ratio,	
			linking the series. Kinematic chain:	
			definition, classification, structure.	
			Adjustment of kinematic chains. Links	
			between kinematic chains. Closed	
			kinematic chains. The main kinematic	
			chain. Defining. Specific structures. The	
			theory of speed. Mechanisms for speed	
			adjustment of gears: ballad block	
			mechanisms, with articulated, mixed	
			wheels, with simple or complex	
			intermediate. Mechanisms for continuously	
			adjusting the speed: definition, structure,	
			characteristics; constructive solutions of	
			mechanical variators. The kinematic feed	
			chain. Defining. Specific structures.	
	2-nd Year	1	Overlapped breasts. Specific regulation	3

		mechanisms. Kinematic chains and	
		intermittent feeders. Kinematic threading	
		chains, threading boxes. Special purpose	
		mechanisms. Mechanisms for reversing	
		the rotation direction: generalities,	
		classification, constructive solutions.	
		Mechanisms for transformation of	
		movement: generalities, classification.	
		Transformation mechanisms with self-	
		reversing: bell-crank, oscillating sliding,	
		rotating sliding. Transforming mechanisms	
		without auto-reversal: screw-nut, pinion-	
		rack. Cutting schemes. Fields of use.	
		Classification. The normal lathe. Revolver	
		lathe (horizontal and vertical). The vertical	
		lathe. Milling machines. Cutting schemes.	
		Fields of use. Classification. Milling	
		machine with console. Planar milling	
		machine. Longitudinal milling machine.	
		Drilling machines. Cutting schemes. Fields	
		of use. Classification. Banjo drilling	
		machine. Column Drilling Machine. Drilling	
		machine with pillar. Radial drilling	
		machine. Planing machines. Boring and	
		milling machine. Planing machines: cutting	
		schemes, fields of use, classification.	
		Shaper. Slotting machine. Boring and	
		milling machine: fields of use,	
		classification, construction. Pickups.	
		Grinding machines. Spinning machine:	
		use, classification, construction. Grinding	
		machines: areas of use, classification,	
		cutting schemes, abrasive bodies.	
		External grinding machine. Inner grinding	
		machine.	
		The content of the seminar or practical	
		works:	
		1. Introductory work; the general	

			presentation of the laboratory the	
			machine-tool room the scope and content	
			of the practical works 2 Kinematic	
			analysis of the normal lathe 3 Kinematic	
			analysis of the milling machine - 2 hours	
			A Kinomatic analysis of the drilling	
			4. Kinematic analysis of the unimity	
			machine. 5. Kinematic analysis of	
			seplicemia. 6. Kinemalic analysis of the	
			grinding machine. 7. Machine control	
 			systems.	
			Mechanics	
			Course content:	
			Recapitulative notions about vector	
			operations, principles and	
			the axioms of mechanics. Moments	
			theory: Moment of force in relation to a	
			point and an axis; Central Axis Reduction	
			Cases; Reducing particular systems of	
			forces; Center of Parallel Forces. Static	
			moments and centers of gravity, Guldin's	
			theorems. Equilibrium of rigid subject to	
			ideal bonds, types of bonds. Methods and	
			theorems in statics of material systems:	
			Element isolation method; Method of	
			solidification: Method of isolating parts.	
			Beam beams. Rubbing in the technique:	
			Rubbina: Rollina friction: Pivotina rubbina:	
			Rubbing in joints and bearings. Static of	
			varns: General equation of varns: Wire	
			rubbing Applications in static technique:	
			Parga and inclined plane: Scrapers and	
			nulley systems: Even the screw: Brake	
			band brake and sabot brake Point	
			Cinematic: Coordinate Systems: Speed	
			and acceleration: Particular moves of the	
			noint	
			The content of the seminar or practical	
	2 nd Voor	1	workey	5
	∠-nu rear	1	WORKS:	5

				1
			S1 - Introduction - vector operations.	
			Applications. S2 - Moment of force relative	
			to a point and an axis. Applications. S3 -	
			Reduction of force systems, center axis,	
			reduction cases. Applications. S4 - Table	
			Centers. Applications. S5 - Equilibrium of	
			the rigid subject to ideal bonds.	
			Applications. S6 - Statics of material	
			systems. Applications. S7 - Friction	
			systems. Applications.	
			Mechanisms	
			Course content:	
			Introduction. Definitions. Structure and	
			configuration of planar mechanisms.	
			Kinematic element. The kinematic	
			coupling. Kinematic chain (definition,	
			classification, degree of freedom,	
			kinematic group). Mechanisms (definition,	
			classification, degree of mobility).	
			Configuration analysis and kinematics of	
			mechanisms. Vector connection equations	
			for configuration, speeds and	
			accelerations. Polygonal vector outline	
			method for solving. configuration and	
			kinematics of the mechanisms. Examples.	
			Spatial Mechanisms. The cardan coupling	
			mechanism. RRSC spatial patroller. RSSR	
			spatial patroller. White mechanism -	
			spatial crank. Force analysis of	
			mechanisms. Engine loads, resistant,	
			exterior, interior, variable, inertia.	
			Determination of the reactions of the	
			kinematic couplers of the mechanisms.	
			The dynamics of the mechanisms. The	
			phases of the movement. Motion	
			equations. Energy Balance. Uniformize the	
			angular speed with the flywheel.	
	2-nd Year	1	Calculation of the moment of inertia of the	4

		mass and weight of the steering wheel.	
		Adjusting non-periodic variations of	
		machine movement.	
		The content of the seminar or practical	
		works:	
		Labor protection rules in the laboratory;	
		Structural analysis of kinematic couplings.	
		Structural analysis of fundamental planar	
		mechanisms. Kinematic analysis of bar	
		mechanisms - bar method. Kinematic	
		analysis of bar mechanisms - the method	
		of projection of polygonal contour of	
		vectors. Determination of reactions to bar	
		mechanisms - method of kinematic group	
		isolation; Determination of Reactions to	
		Bar Mechanisms - Method of isolating	
		kinematic elements (matrix method).	
		Cinematic analysis of spatial	
		mechanisms	
		meenamisms	
		Numerical Methods	
		Numerical Methods Course content:	
		Numerical Methods Course content: 1. ERRORS IN NUMERICAL METHODS.	
		Numerical Methods     Course content:     1. ERRORS IN NUMERICAL METHODS.     Introduction.   Truncation	
		Numerical Methods     Course content:     1. ERRORS IN NUMERICAL METHODS.     Introduction.     Truncation     Errors.     Representing numbers in your computer.	
		Numerical Methods     Course content:     1. ERRORS IN NUMERICAL METHODS.     Introduction.   Truncation     Errors.     Representing numbers in your computer.     Errors by rounding.	
		Numerical Methods     Course content:     1. ERRORS IN NUMERICAL METHODS.     Introduction.     Truncation     Errors.     Representing numbers in your computer.     Errors by rounding.     LINING EQUIPMENT     SYSTEMS	
		Numerical Methods     Course content:     1. ERRORS IN NUMERICAL METHODS.     Introduction.     Truncation     Errors.     Representing numbers in your computer.     Errors by rounding.     LINING EQUIPMENT     SYSTEMS     DIRECT     METHODS.     Introduction.     Gauss     removal	
		Numerical Methods   Course content:   1. ERRORS IN NUMERICAL METHODS.   Introduction. Truncation   Errors by rounding. LINING EQUIPMENT   SYSTEMS DIRECT METHODS.   Introduction. Gauss removal and	
		Numerical Methods   Course content:   1. ERRORS IN NUMERICAL METHODS.   Introduction. Truncation   Errors by rounding. LINING EQUIPMENT   SYSTEMS DIRECT METHODS.   Introduction. Gauss removal and   elimination Gauss-Jordan. Pitching and elimination	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.GaussremovalandeliminationGauss-Jordan.Gauss-standard.MatrixOperations.	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.GaussremovalandeliminationGauss-Jordan.PitchingGauss-standard.MatrixDiversionoperations.Inversionof a matrixDeterminantof a	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrors.Representing numbers in your computer.Errors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.GaussremovalandeliminationGauss-Jordan.PitchingGauss-standard.MatrixOperations.Inversion of a matrixDeterminant of amatrix.PrivateMatrices.ITERATIVE	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrors.Representing numbers in your computer.Errors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.GaussGauss-Jordan.Pitching and eliminationGauss-standard.Matrixoperations.Inversion of a matrixDeterminant of amatrix.PrivateMETHODS.Introduction.Vectorand	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrorsRepresenting numbers in your computer.Errors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.Gauss-Jordan.Pitching and eliminationGauss-standard.Matrix operations.Inversion of a matrixDeterminant of amatrix.PrivateMETHODS.Introduction.VectorandmatrixPrivateMETHODS.Introduction.Vectorandmatrix rules.The Jacobi method uses the	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrorsRepresenting numbers in your computer.Errors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.Gauss-Jordan.Pitching and eliminationGauss-standard.Matrix operations.Inversion of a matrix Determinant of amatrix.PrivateMETHODS.Introduction.Vectorandmatrix rules.The Jacobi method uses theGauss -SeidelGauss -Seidel	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrors.Representing numbers in your computer.Errors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.GaussGauss-Jordan.Pitching and eliminationGauss-standard.Matrix operations.Inversion of a matrix Determinant of amatrix.Private Matrices.ITERATIVEMETHODS.Introduction.Vector andmatrix rules.The Jacobi method uses theGauss - Seidel method.Relaxationmethods.NUMERICAL INTERPOLATION.	
		Numerical MethodsCourse content:1. ERRORS IN NUMERICAL METHODS.Introduction.TruncationErrors.Representing numbers in your computer.Errors by rounding.LINING EQUIPMENTSYSTEMSDIRECTMETHODS.Introduction.GaussremovalandeliminationGauss-Jordan.PitchingGauss-standard.MatrixInversion of a matrixDeterminant of amatrix.PrivateMETHODS.Introduction.Vectorandmatrix rules.The Jacobi method uses theGaussSeidelGauss- Seidelmethods.NUMERICAL INTERPOLATION.Introduction.Lagrangeinterpolation	

			aquidictant nodes. Analysis of polynomial	
			internalation Outrie online functions	
			Interpolation. Cubic spline functions.	
			NUMERICAL CUADRATURE. Introduction	
			Rule of rectangle and trapezoid rule.	
			Simpson's rules. Quantum Formulas	
			Newton - Cotes. Gauss quadrature.	
			The content of the seminar or practical	
			papers:	
			Review of programming knowledge in C	
			++ Errors in numerical methods	
			CONVERSIA FROM ZECIMAL IN BINAR	
			Gauss removal with pivoting. The reverse	
			of a matrix III decomposition	
			Upprovided M aveterna The Jacobi	
			Unspecified in systems. The Jacobi	
			method. Gauss-Seidel iterative method.	
			Lagrange interpolation. Cubic spline	
			interpolation. Numerical quadrature:	
			Rectangle method and trapezoid method.	
			Quantum formula Newton-Cotes.	
			VERIFICATION OF KNOWLEDGE.	
			Materials Strength	
			Course contents:	
			Chapter 1 Introduction: Definitions,	
			structural concepts (bars), requests,	
			approaches. Chapter 2 Cutting forces and	
			bending moments. Chapter 3 Behavior of	
			Materials Chapter 4 Expansion /	
			Compression of bars Chapter 5 Straight	
			section cross sections Chapter 6 Bending	
			of bars Chapter 7 Bars with circular or	
			on bars. Chapter 7 bars with circular of	
			annular section, torsion of rectangular	
			Verification Methodology of Dara	
			venincation methodology of Bars.	
			Seminar content or practical works:	
			Seminar	
			1. Efforts diagrams on plain beams and	
			console beams. Efforts diagrams at simple	
	2-nd Year	1	beams with consoles and inclined beams.	5

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			2. Efforts diagrams of Gerber beams and	
			plain frames. Effort diagrams for bar	
			systems. 3. Calculation of the main center	
			inertia moments of the composite sections	
			with a symmetry axis. Calculation of main	
			center inertia moments of sections without	
			axis of symmetry, 4. Straight bars required	
			for stretching or compression: verification.	
			sizing and resistance calculation.	
			Calculation of unstable static simple axial	
			load systems with temperature variations	
			and displacements due to errors	
			found during assembly 5 Verification	
			sizing and calculation of resistance	
			strength of bars required at bending 6	
			Calculation of the beams displacements	
			required at bending with the initial	
			parameter method 7 Verification sizing	
			and coloulation of the resistance strength	
			of the sircular (or ring) section here	
			of the circular (of ring) section bars	
			lequiled at field torsion.	
			Laboratory Learning to work with	
			programs for Straight Bar Resistance and	
			Flat and Bar Systems efforts).	
			Sports	
			The content of the seminar or practical	
			works:	
			1. Presentation of minimal theoretical	
			content regarding the activity of physical	
			education, training for labor protection,	
			presentation of the objectives and	
			requirements of the discipline, support of	
			the initial tests. 2. Repeat the main	
			methods of football - girls and volleyball	
			girls, known from previous cycles.	
			Positioning in attack and defense systems.	
			Bilateral games. Developing the rectifying	
	2-nd Year	2	rate to auditory and visual stimuli. Repeat	3

			kick start and launch from start,	
			development of the speed of movement	
			through accelerators on variable distances	
			20-60m. Educating dynamic strength in	
			upper, lower limbs, abdomen and trunk by	
			working in the circuit and by working on	
			workshops, 3. Evaluation with specific	
			scores, the level of movement speed	
			development and segmental muscle	
			strength 4 Presentation of the topic	
			approached in semester 2 Readiness to	
			effort Sports Games 5 Strengthen the	
			main elements and technical procedures	
			specific to sports games. Their repetition	
			in adversity in a bilateral game	
			Developing the elements of coordinating	
			capacity rhythm procision static and	
			dynamia balance anotic temporal	
			ariantation combination of movements	
			vinentation, combination of movements,	
			kinestnetic discrimination,	
			ambidextructure, agility. Education of	
			aerobic and mixed resistance by the	
			method of uniform and variable efforts. 6.	
			Evaluation with specific evidence, the level	
			of development of resistance and the	
			degree of mastery of a sports game.	
			Applied Informatics	
			Course content:	
			1. Introduction. Overview of the software	
			application. Opening the session. File	
			types and applications. Projects. Ribbon	
			appearance. Show panel. Tools.	
			Customize user commands. 3DModel	
			panel (Sketch, Create, Modify, Work	
			features, Pattern, Surfaces). Sketch panel	
			(Constraints, Insert, Format). Inspect	
			panel (Measure, Analysis). Tools panel	
	2-nd Year	2	(Materials, Options, Clipboard, Find).	3

	Manage panel (UpDate, Parameters,
	Styles, Layout, Author, iLogic, Content).
	View panel (Visibility, Appearance,
	Windows, Navigate). Environments panel
	(Begin, Convert, Manage). Get Started
	Panel (Launch, My Home, New Features,
	Videos & Tutorials). Vault panel. Autodesk
	360 Panel Application (3D Model and 2D
	Representation). 2. 3D modeling of
	molded parts. Work strategy. Effective
	application and use of work tools.
	Applications, 3, 3D modeling of the board
	elements. Table development strategy.
	Specific working tools, Application, 4, 3D
	modeling of assemblies. Working
	principles. Application, 5. Develop 3D
	models of welded parts. Procedures and
	tools. Application. 6. 3D design of the
	mechanical structures in the profiles. Tools
	and work strategy. Applications. 7.
	Specific procedures for 3D modeling of
	plastic parts. Dedicated tools and
	applications. 8. Assisted Design of
	Mechanical Transmission I. Trees.
	grooves, bearings, feathers, sealing
	elements, constructive-functional details,
	Applications, 9. Assisted design of
	mechanical transmissions II. Automatic
	calculation and design of cylindrical,
	conical and worm gears. 10. Assisted
	Design of Mechanical Transmissions III.
	Automatic calculation and design of belts
	and chains.
	The content of the seminar or practical
	works:
	1. 3D modeling of simple landmarks.
	1. 3D modeling of simple landmarks. Learning how to work. 2. Applications of

			Different. Applications for sheet metal parts. 4. Developing applications for assemblies of different difficulty parts.5. Elaboration of various applications of welded parts. 6. Applications for 3D design of the mechanical structures in the profiles 7. Solid medaling of plastic parts	
			8. Applications for automatic tree design.	
			grooves, feathers, seals). 9. Applications	
			and worm gears. 10. Applications to belt	
			and chain transmissions.	
			The content of the seminar or practical	
			Somester I Electrical Specialized	
			vocabulary and discourse situations	
			Grammar in focus: Scale of likelihood	
			Electronics. Specialized vocabulary and	
			discourse situations. Grammar in focus:	
			Subordinate clauses of result and	
			purpose. Civil Engineering. Specialized	
			vocabulary and discourse	
			Situations. Grammar in focus: Comparison	
			of adjectives. Assessment test. Semester	
			II - Energy. Specialized vocabulary and	
			discourse situations. Grammar in focus:	
			Countable and uncountable nouns.	
			Adjectives and adverbs. Petroleum.	
			Specialized vocabulary and discourse	
			situations. Grammar in focus: Prepositions	
			Distice Specialized vecabulary and	
			discourse situations Grammar in Focus	
			Quantifiers Writing in focus: Definition and	
			exemplification. Telecoms. Specialized	
	2-nd Year	2	vocabulary and discourse situations.	2

			Writing in Focus: Comparing and	
			Contrasting Ideas. Assessment test.	
			Fluid Mechanics	
			Course contents:	
			Chapter 1. Measurement units. Fluid	
			properties. The notion of continuous	
			environment. Chapter 2. Fluid statics:	
			Pressure and pressure measurement.	
			Hvdrostatic forces on flat surfaces.	
			Relative equilibrium of fluids with free	
			surface in	
			rectilinear motion or rotation. Forces that	
			act on immersed bodies - the principle of	
			Archimedes, Chapter 3, Basic equations of	
			fluid mechanics: Notions of fluid	
			kinematics. Total Derivative. The gearbox.	
			Acceleration field. Line current equation.	
			The infinitesimal fluid element method.	
			Bernoulli's equation. The laws	
			fundamental preservation of mass,	
			impulse and energy. Equation of	
			continuity. Chapter 4. Navier-Stokes	
			Equations: Deduction of the Navier-Stokes	
			equations. Applications in case of laminar	
			flow. Turbulent flow. Chapter 5.	
			Dimensional Analysis and Similarity	
			Theory. Fundamental and derived physical	
			quantities. The principle of dimensional	
			homogeneity. The Rayleigh method. Pi	
			Theorem. Definition of similarity. Analysis	
			of similarity criteria Re, Fr, Sh, Eu, Ma.	
			Model Law. Chapter 6 Limit layer theory.	
			Limit turbulent limit. Applications to flow	
			around bodies.Cap 7 Flow through pipes:	
			Laminar flow and turbulence. Effect of	
			viscosity. The motion equation. Friction	
			coefficient and pipe roughness. Local	
	2-nd Year	2	pressure losses. Hydraulic slope and	2

			energy slope. Pipelines - pipes connected			
			in series and parallel. Hit of a ram.			
			The content of the seminar or practical			
			papers:			
			Measurement of pressure. Measuring			
			viscosity. Measure the impulse.			
			Reynolds's experience. Flow through			
			pipes: Calculation of friction pressure			
			losses and calculation of local pressure			
			losses.			
			Flow through pipelines: Flow			
			measurement methods. Hit of a ram.			
			Mechanisms			
			Course content:			
			Introduction. Definitions. Structure and			
			configuration of planar mechanisms.			
			Kinematic element. The kinematic			
			coupling. Kinematic chain (definition,			
			classification, degree of freedom,			
			kinematic group). Mechanisms (definition,			
			classification, degree of mobility).			
			Configuration analysis and kinematics of			
			mechanisms. Vector connection equations			
			for configuration, speeds and			
			accelerations. Polygonal vector outline			
			method for solving. configuration and			
			kinematics of the mechanisms. Examples.			
			Spatial Mechanisms. The cardan coupling			
			mechanism. RRSC spatial patroller. RSSR			
			spatial patroller. White mechanism -			
			spatial crank. Force analysis of			
			mechanisms. Engine loads, resistant,			
			exterior, interior, variable, inertia.			
			Determination of the reactions of the			
			kinematic couplers of the mechanisms.			
			The dynamics of the mechanisms. The			
			phases of the movement. Motion			
 	 2-nd Year	2	equations. Energy Balance. Uniformize the	3		
angular speed with the flywheel. Calculation of the moment of inertia of the mass and weight of the steering wheel. Adjusting non-periodic variations of machine movement. The content of the seminar or practical works: Labor protection rules in the laboratory; Structural analysis of kinematic couplings. Structural analysis of fundamental planar mechanisms - bar method. Kinematic analysis of bar mechanisms - the method of projection of polygonal contour of vectors. Determination of reactions to bar mechanisms - Method of kinematic group isolation; Determination of Reactions to Bar Mechanisms - Method of kinematic group isolation; of kinematic group isolation; of kinematic group isolation; of kinematic group isolation; determination of Reactions to Bar Mechanisms - Method of isolating Kinematic elements (matrix method). Cinematic analysis of spatial mechanisms. Machine Parts General problems of machine building. Mechanical engineering calculation principles. Mechanical characteristics of materials used in machine building. Form and dimensional accuracy of car bodies. Calculation at simple and compound queries. Calculation at variable requests. Safety criteria for car bodies. Reliability of car bodies. Non-demountable joints. Threaded joints. Welded joints. Joint gby soldering. Joint joining. Removable assemblies. Threaded assemblies: thread classification; geometrical elements; screw and nut materials; the friction moment in the thread; auto-fatigue condition; the moment of friction between the nut and the bearing surface; thread calculation is the soldering. Joint joining. Augusta	-		-	-		
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mass and weight of the steering wheel.         Adjusting non-periodic variations of machine movement.         The content of the seminar or practical works:         Labor protection rules in the laboratory;         Structural analysis of kinematic couplings.         Structural analysis of kinematic couplings.         Structural analysis of bar method.         mechanisms.         Structural analysis of bar method.         mechanisms - bar method.         Kinematic         analysis of bar method.         projection of polygonal contour of vectors.         vectors.         Determination of reactions to bar method filtermeatic group isolation;         Bar Mechanisms - Method of isolating kinematic elements (matrix method).         Cinematic analysis of spatial mechanisms.         Machine Parts         General problems of machine building.         Mechanical engineering calculation principles.         Mechanical characteristics of materials used in machine building.         Galculation at simple and compound queries.         Calculation at simple requests.         Safety criteria for car bodies.         Calculation at simple requests.         Safety criteria for car bodies.         Safety criteria for car bodies.         Safety criteria for car bodies.         Safety crit					Calculation of the moment of inertia of the	
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2-nd Year 2 bearing surface; thread calculation; 3					moment of friction between the nut and the	
			2-nd Year	2	bearing surface; thread calculation;	3

			calculation of assemblies with bolts	
			without initial clamping; calculation of	
			assemblies with initial clamping screws;	
			fatigue calculation of assemblies with	
			initial clamping screws; calculation of	
			assemblies with eccentric eccentric	
			screws: calculating the screws required at	
			the shock. Joining of hubs and shafts:	
			feather assemblies: chisel assemblies:	
			pressed assemblies polygonal	
			assemblies Elastic assemblies Springs	
			with traction-compression voltages:	
			Springs with torsional voltages: Springs	
			with bonding stresses	
			Domain Bractical Training	
			Course content:	
			Concred training on occupational safety	
			Conoral nations about motal autting	
			Knowledge and interpretation of	
			Knowledge and interpretation of	
			technological documentation. Measuring	
			and control equipment. Operations, tools	
			and tools used in locksmiths. Lurning.	
			Milling. Floating and mooring. Correction.	
			Casting. The Cooperative Workshop.	
			Casting. Workshop. Turning. The	
			Workshop. Casting. Workshop for cleaning	
			molded parts. Casting. Technology for	
			obtaining cast iron with nodular graphite.	
			Turning. Centrifugal casting technology of	
			the cylinder shim. Casting. Coil Shooting	
			Machines. Hot plastic deformation sectors.	
			Thermal and thermo-chemical treatments.	
			Galvanic coatings. Welding. Practice	
	2-nd Year	2	colloquy	4
			Materials Strength	
			Course contents:	
			Chapter 1 Introduction: Definitions,	
	2-nd Year	2	structural concepts (bars), requests,	3

		approaches. Chapter 2 Cutting forces and	
		bending moments. Chapter 3 Behavior of	
		Materials. Chapter 4 Expansion /	
		Compression of bars. Chapter 5 Straight	
		section cross sections. Chapter 6 Bending	
		of bars Chapter 7 Bars with circular or	
		annular section torsion of rectangular	
		cross-section bars Chapter 8 Sizing /	
		Verification Methodology of Bars	
		Seminar content or practical works:	
		Seminar	
		1 Efforts diagrams on plain beams and	
		console beams Efforts diagrams at simple	
		beams with consoles and inclined beams	
		2 Efforts diagrams of Gerber beams and	
		plain frames Effort diagrams for bar	
		systems 3 Calculation of the main center	
		inertia moments of the composite sections	
		with a symmetry axis. Calculation of main	
		center inertia moments of sections without	
		axis of symmetry 4. Straight bars required	
		for stretching or compression: verification	
		sizing and resistance calculation	
		Calculation of unstable static simple axial	
		load systems with temperature variations	
		and displacements due to errors	
		found during assembly 5 Verification	
		sizing and calculation of resistance	
		strength of bars required at bending 6	
		Calculation of the beams displacements	
		required at bending with the initial	
		narameter method 7 Verification sizing	
		and calculation of the resistance strength	
		of the circular (or ring) section have	
		required at free torsion	
		Laboratory Learning to work with	
		programs for Straight Bar Resistance and	
		Flat and Bar Systems offerts)	
		$\Gamma$ i la anu da systemis enurs <i>j</i> .	

			Thermotechnics	
			Objectives: Presenting some general	
			aspects to establish minimal knowledge	
			about the thermal phenomena	
			encountered in the engineering,	
			fundamental notions regarding	
			thermodynamics of systems. Knowledge	
			of the fundamental thermodynamic notions	
			necessary for the understanding and	
			deepening of the knowledge at the	
			specialized courses of the later years.	
			Course Content. Fundamentals of	
			thermodynamics: energy, sources and	
			energy receptors. Energy systems,	
			thermodynamic systems.	
			Thermodynamics Postulates. Study of	
			closed, homogeneous, unitary	
			thermodynamic systems. Simple,	
			reversible, open gas transformations.	
			Study of thermodynamic system in	
			stabilized flow. Homogeneous and non-	
			uniform thermodynamic system (perfect	
			gas mixtures). Thermodynamics of thermal	
			agents: vapor thermodynamics; moisture	
			saturated vapor states; constant title	
			curves; relationships between vapor state	
			sizes; Capeyron-Clausius equation; vapor	
			state transformations (isochoric, isobar,	
			isotherm, reversible and irreversible	
			adiabatic). Wet air thermodynamics: the	
			physical properties of wet air; i-x wet air	
			diagram; graphical determination of wet air	
			status; Simple wet air conversions	
			(constant humidity content, constant	
			temperature, constant enthalpy and mixing	
			of two wet air flows with different states).	
			Thermodynamics of compressible fluids at	
	2-nd Year	2	high speeds. Thermodynamics of fuel	2

			combustion. Thermodynamics of thermal	
			machine cycles.	
			Dimensional Control and Tolerances	
			Course contents:	
			Introduction. Object and importance of	
			discipline. The principle of	
			interchangeability. Dimensional precision.	
			Dimensions, deviations, tolerances. Fits.	
			Adjustment systems. System of tolerances	
			and ISO adjustments. Microgeometric	
			precision. Surface corrugation and	
			roughness; causes of their occurrence,	
			characteristics, physical parameters and	
			roughness statistics; enrollment on their	
			drawing. Roughness evaluation	
			techniques. Precision of geometric shape.	
			Deviations of the macrogeometric form.	
			Definition of deviations, graphical	
			representations, marking tolerances of	
			form on drawings. Techniques for	
			assessing macroeconomic precision.	
			Precision of orientation and reciprocal	
			position. Deviations from orientation,	
			deviations from the relative position of	
			surfaces, radial beating and frontal	
			beating: definition, cases, representations,	
			drawing on the drawing. Techniques to	
			control them. Chains of dimensions.	
			Definition, classification and methods for	
			resolving size chains. Methods and means	
			of measurement and control. Classification	
			of dimensional control methods.	
			Metrological features. Measurement	
			errors. Universal dimensional control	
			means. Tolerances, adjustments and	
			control of smooth tapered assemblies,	
			bearings and feather assemblies.	
	2-nd Year	2	Tolerances, adjustments and control of	3

		threaded assemblies. Tolerances,	
		adjustments and control of gears and	
		gears.	
		The content of the seminar or practical	
		works:	
		1. Conducting work safety training, taking	
		students into account, presenting the	
		laboratory and laboratory work.	
		Presentation of the universal measuring	
		instruments used in laboratory work. 2.	
		External and internal dimension control	
		with vernier and micrometric tools. 3.	
		Control of dimensions and deviations from	
		the geometric shape by means of	
		comparators. 4. Measurement of surface	
		roughness. 5. Measure angles and	
		conicities. 6. Thread measurement. 7.	
		Toothed wheel control. 8. Using ISO	
		standards for calculations with tolerances	
		and adjustments. Identifying the elements	
		that define a tolerated dimension,	
		establishing limit deviations for a tree and	
		a bore, plotting the limit deviations and	
		tolerance fields for the shaft and bore,	
		calculating their tolerances. Identifying the	
		type of adjustment and the system of	
		adjustments in which it is formed,	
		graphical representation of the fitting,	
		determining the boundary characteristics	
		in an assembly, calculating the tolerance	
		of a fit. Enumeration of dimensional	
		tolerances on reference drawings and	
		fittings on the overall drawings. 9. Solving	
		the dimensional chains 10. Completing the	
		reports on the laboratory works performed.	
		Restoration of a laboratory work not	
		performed. Verification of the papers and	
		final mark of the students in the laboratory	

			activity.	
			Hydraulic and Pneumatic Drives	
			Course content:	
			General elements of structure of	
			bydroppoumatic systems Organism of	
			hydropheumalic systems. Organism of	
			nydrostatic systems. distribution	
			equipment. Pressure regulating	
			equipment. flow regulation equipment.	
			Auxiliary equipment for hydraulic	
			schemes. Hydraulic schemes for different	
			cycles. General notions about penetrating	
			actions. Compressed air leakage.	
			Pneumatic discharge components.	
			Pneumatic valves. compressed air	
			filtration. Lubrication of compressed air.	
			pneumatic schemes.	
			The content of the seminar or practical	
			works:	
			The apparatus that is part of the	
			hydrostatic drive systems and its	
			symbolization. Hydraulic pumps (with	
			gears pallet axial pistons) Construction-	
			functional analysis and calculation of	
			hydraulic cylinders. Functional analysis of	
			drawers with drawers Constructional	
			functional analysis of the prossure and	
			flow control aquinment Single acting	
			now control equipment. Single acting	
			pheumatic cylinder with direct control and	
	0.11/1.11		indirect control. Functional pneumatic	
	3-ra year	1	schemes.	4
			Elasticity	
			Course content:	
			Generalities on Elasticity Theory. The	
			theory of tensions. The theory deformed.	
			Relationships between stresses and	
			specific deformations. Mechanical work	
			and potential deformation energy.	
	3-rd Year	1	Particular cases of voltage state. Flat	5

			problems in clasticity theory	
			The content of the seminar or practical	
			papers:	
			Applications to the state of tension at a	
			point in a body. Main stresses and main	
			directions of the voltage state. Applications	
			to the deformation state at a point in a	
			body. Relationships between stresses and	
			specific deformations. Apply Hooke's	
			generalized law. Applications to the flat	
			state of stress and deformation.	
			Machine Parts II	
			Course content:	
			Mechanical transmission through gearing.	
			Classification of gears. Materials, thermal	
			treatments for gears and teeth	
			technologies. Causes of gear loss.	
			Cylindrical gears with straight teeth:	
			geometrical elements, calculation of the	
			cylindrical gear with straight teeth at	
			bending and contact. Cylindrical gears	
			with inclined teeth: geometrical elements.	
			equivalent gear, forks in cylindrical gear	
			with inclined teeth. calculation of	
			cylindrical gear with teeth inclined at	
			bending and contact: Conical gears: types	
			of conical teeth reference plane wheel	
			geometric elements of the conical gear	
			with straight teeth conical gears	
			calculation with straight teeth at bending	
			and contact: Cross-axle dears:	
			classification worm dears: deometric and	
			kinematic elements materials forces in	
			the worm dear worm dear calculation and	
			contact: Heat calculation of goars:	
			Mechanisms with gears Friction wheel	
			drive Classification: Calculation of	
		4	unve Classification, Calculation of	2
	3-ru rear	1	cylinuncal inction wheel transmissions;	2

Calculation of transmissions w	vith conical
friction wheels; Variators w	ith friction
wheels. Belt transmissions Cla	assification;
Traction capability, Forces	and main
stresses in a belt, Calculation of	of wide belt
transmissions. V-Belt tr	ansmission
calculation. Belt drives	. Chain
transmissions Classification.	Force in
chain transmission. Chain tr	ansmission
calculation. Axes and trees Cla	assification.
materials, tree pre-dimensioni	na, fatique
checking, rigidity check, crit	ical speed
check. Slip Bearings Co	onstruction.
materials, calculation of frictio	n bearings
U. L. M. calculation of hydrogeneration of hydrogen	drodvnamic
bearings, hydrostatic bearing	is. Rolling
bearings (bearings). Cla	assification.
Symbolisation, Calculation of c	Jurability of
rotating bearings, calculation	of non-
rotating bearings, lubrication o	of bearings.
Clutches. Fixed permanent	couplings,
Permanent compensating	couplings,
Intermittent couplings.	Automatic
intermittent couplings. Safety	couplings.
The organs of the white crank n	nechanism.
Force in the crank mechanisr	n, Pistons,
Biela: the calculus. Crankshafts	
The content of the seminar o	r practical
works:	•
Paper no. 1 - Generating teeth	in evolution
by the rolling method. Work	< no. 2 -
Restoration of the geometric ele	ements of a
straight gear with straight teeth	i. Work Nr.
3 - Determination of the	
cylindrical gear elements for	equivalent
	equivalent cylindrical
and conical gears. Work no.	equivalent cylindrical 4 - Elastic
and conical gears. Work no. sliding and traction characterist	equivalent cylindrical 4 - Elastic tic of belts.

			friction losses in bearings Work no. 6	
			Determination of the pressure distribution	
			Determination of the pressure distribution	
			In the lubricating film in the hydrodynamic	
			Iubrication sliding bearings. Work Nr. 7 -	
			Determination by calculation of the	
			operating characteristic of elastic	
			couplings.	
			Materials Strength III	
			Course content:	
			Chapter 1 Composite requests. Chapter 2	
			Stability of the elastic balance .Cap.3	
			Energy methods in the calculation of the	
			bar structures. 4 Static undetermined	
			systems. 5 Dynamic Requests	
			Seminar content or practical works:	
			Seminar: 1. Oblique bending of straight	
			bars: verification, sizing and calculation of	
			resistance capacity. 2. Problems of	
			checking and sizing of bending shafts +	
			torsion. 3. Bending with axial force of	
			straight bars: verification sizing and	
			calculation of resistance capacity	
			(eccentric stretching / compression) 5	
			Straight beam buckling (to be carried out	
			in the laboratory where it is determined	
			experimentally using the resistive electric	
			tensometry method the critical buckling	
			force) Colculation of punctual elastic	
			displacements with formula Maxwell Mohr	
			6 Solving upprosified static systems with	
			of solving unspecified static systems with	
			enont method. Systems with external	
			indeterminacy. Systems with internal	
			undetermination. 7. Problems of dynamic	
			stresses: through inertial and shock forces	
			(It will take place in the laboratory, where	
			the maximum dynamic shock voltage is	
			determined experimentally by the resistive	
	3-rd Year	1	electric tensometry method). Laboratory:	4

			1. Testing for traction and compression of	
			steels (at ambient temperature) .2.	
			Determining the stiffness of a helical	
			spring. 3. Resistive electrical tensometry	
			method. 4. Determination of the critical	
			buckling force by the resistive electric	
			tensometry method. 5. Verification of the	
			Navier formula using the resistive	
			electrical tensometry method 6 Measure	
			the stresses and deformations at the	
			torsion of the ring bars by the resistive	
			electric tensometry method 7	
			Experimental testing of stresses for	
			compound requests	
			Thermotechnics II	
			Thermodynamics of thermal agents: Peal	
			dases. The real das properties of the das	
			Van der Waals equation Other real das	
			vali dei waals equation. Other real gas	
			irreversible disintegration. The effect of	
			Ineversible disintegration. The effect of	
			Joule-Thomson. Thermodynamics of	
			vapor. Saturation vapor state vaporizes.	
			Constant title curves. Relationship	
			between vapor liquid state sizes. Vapor	
			tables and diagrams. Capeyron-Clausius	
			equation. Vapor state transformations: tr.	
			isochora, isobar, isotherm, reversible and	
			irreversible adiab, vapor lamination.	
			Thermodynamics of wet air. Physical	
			properties of wet air. Diagram i-x for wet	
			air. Graphical determination of wet air	
			status. Simple wet air transformations: tr.	
	3-rd Year	1	to constant moisture	5
			Tribology	
			Course content:	
			Tribology - introduction. Definitions, short	
			history. Objectives of tribology,	
	3-rd Year	1	interdisciplinarity of tribology. Tribology	2

		and global environment, requirements and	
		perspectives. Head. 1. Basic notions and	
		concepts in tribology. Tribosystems:	
		structure, functions, demands, systemic	
		analysis in tribology. Methods for	
		tribological testing: classification.	
		tribological test chain. Test systems.	
		Modeling and simulation of tribological	
		phenomena and processes Head 2	
		Interactions between triboelements.	
		Contact processes. The mechanic of	
		hertzian contact. Friction processes:	
		theories of friction and wear: friction	
		modes. slip-slip peculiarities (stick-slip	
		effect) and rolling friction. Wearing	
		processes: adhesion wear, abrasion wear,	
		superficial fatigue wear, corrosion wear	
		and fretting wear, cavitation wear,	
		particular or combined wear, wear and	
		tear. Head. 3. Triboelement properties.	
		Materials used in tribological applications.	
		The superficial laver and its tribological	
		parameters. Changing the superficial laver	
		properties. Head. 4. Lubricants.	
		Classifications. Physical and chemical	
		properties of oils: viscosity, additives.	
		Mineral oils. Synthetic oils.Unsori.	
		Vegetable and animal oils and greases.	
		Solid lubricants. Unconventional	
		lubricants. Self-lubricating composites.	
		Chapter 5. Lubrication regimes (limit,	
		mixed, fluid: hydrodynamic, hydrostatic,	
		gas-dynamic). The elastohydrodynamic	
		regimen (EHD). Chapter 6. Seals.	
		Technical and environmental requirements	
		imposed on seals. Materials for sealing.	
		Types of seals. Sealing systems. Chapter	
		7. Machine and machine lubrication,	

			· · · · · · ·	
			engine lubrication. Processes and	
			lubricating devices. Lubrication Schemes	
			and Installations. Organizing the	
			lubrication activity.	
			The content of the seminar or practical	
			works:	
			Laboratory: 1. Lubricants: recognition,	
			operation with product catalogs, national	
			and international, environmental legislation	
			on fresh and used lubricants. 2.	
			Determination of mineral oil properties:	
			measurement of kinematic viscosity with	
			capillary viscometers. 3. Study of the	
			influence of load, body materials in contact	
			and geometry on the characteristics of	
			hertitian contact. 4. Friction and wear tests	
			on the tribods of the pin / disc; determining	
			the coefficient of friction for different	
			materials. 5. Surface topography:	
			realization of 2D and 3D digital profiles for	
			new and used surfaces, interpretation of	
			roughness parameters. 6. Friction study in	
			threaded assemblies. 5. Identification and	
			characterization of wear damage. 7. Case	
			study: organizing the lubrication activity in	
			a mechanical section. Domestic Themes:	
			Identification. characterization and	
			equivalence of lubricating oils (10 oils).	
			Study of influence of load, body materials	
			in contact and geometry on the	
			characteristics of hertitian contact. The	
			studv	
			loading influences, body materials in	
			contact, and thread type on friction in	
			threaded assemblies.	
			Mechanical Vibrations	
			Course contents:	
	3-rd Year	1	Cap. 1 Mechanical vibrations - general	4

		considerations. Introductory notions.	
		Classification of vibrations. Characteristic	
		dimensions. Measurement units. Elements	
		of vibration kinematics. Representing	
		vibrations using rotating vectors.	
		Composition of harmonic vibrations. Head.	
		2 Vibrations of linear elastic systems with	
		a degree of freedom, 1. Free unborn	
		vibrations. Torsional vibrations. Elastic	
		constants. 2. Free damp vibrations in	
		viscous damping systems. Logarithmic	
		Decrement. 3. Forced vibrations in	
		systems with a degree of freedom. Forced	
		vibrations without damping, excited by	
		harmonic disturbing force. System	
		behavior in resonance. System behavior	
		near resonance. 4. Forced vibration	
		damping in systems with a degree of	
		freedom. Forced vibrations with damping,	
		excited by harmonic disturbing force.	
		Forced vibrations with damping, excited by	
		disturbing force produced by unbalanced	
		rotating mass. 5. Transmisibilitate. System	
		excitement through the base. Isolation	
		anti-vibration. Energy aspects of system	
		vibrations with a degree of	
		Freedom. Head. 3 Vibrations of linear	
		elastic systems with finite number of	
		degrees of Freedom. 1. Free vibrations of	
		systems with finite number of degrees of	
		freedom. Establishing motion equations	
		using the D'Alembert Principle. Influence	
		coefficient method. Using Lagrange	
		equations. Own modes of vibration. The	
		orthogonality of their own vibrational	
		forms. 2. Forced vibrations without	
		damping of systems with finite number of	
		degrees of freedom. Determination of	

Principle. The dynamic absorber. Use of influence coefficients for determination of differential equations. 3. Studious vibration study without damping using modal analysis. 4. Free damp vibration. Forced vibration damping. Study of vibration damped using the complex form of spinning vectors. Head. 4. Vibration of continuous systems. Longitudinal vibrations of straight bars. Turning vibrations of straight bars of circular cross section. Bending vibrations of straight bars of circular cross section. Bending vibrations of straight bars of circular cross section. Bending vibrations. The Holzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration measurement. Measured sizes. Components of a measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction.Recapitulation of the necessary notions from previously studied subjects.Protectia muncii. 2. Free vibrations without damping in systems with a degree of freedom. 3. Free damping vibrations without damping in systems with finite number of degrees of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 6. Free vibrations without damping in systems with finite number of degrees of freedom. 6. Free vibrations without damping in systems with	Differential Equations with the D'Alembert		
influence coefficients for determination of differential equations. 3.Studious vibration study without damping. Study of vibration damped using the complex form of spinning vectors. Head. 4 Vibration of continuous systems. Longitudinal vibrations of straight bars. Turning vibrations of straight bars. Therholzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration measurement Measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction. Recapitulation of the necessary notions from previously studied subjects.Protectia muncii. 2. Free vibrations without damping in systems with a degree of freedom. 3. Free damping vibrations without damping in systems with a degree of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 5. Free	Principle. The dynamic absorber. Use of		
differential equations. 3. Studious vibration study without damping using modal analysis. 4. Free damp vibration. Forced vibration damping. Study of vibration damped using the complex form of spinning vectors. Head. 4 Vibration of continuous systems. Longitudinal vibrations of straight bars of circular cross section. Bending vibrations of straight beams. Head. 5 A proximate methods in the study of vibrations. The Holzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration measurement. Measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction.Recapitulation of the necessary notions from previously studied subjects.Protectia muncii. 2. Free vibrations in systems with a degree of freedom. 3. Free damping vibrations in systems with a degree of freedom. 3. Free damping vibrations without damping in systems with finite number of degrees of freedom. 6. Forced vibrations without damping in systems with finite number of degrees of freedom. 6.	influence coefficients for determination of		
study without damping using modal analysis. 4. Free damp vibration. Forced vibration damping. Study of vibration damped using the complex form of spinning vectors. Head. 4 Vibration of continuous systems. Longitudinal vibrations of straight bars of circular cross section. Bending vibrations of straight beams. Head. 5 Approximate methods in the study of vibration s. The Holzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration caps. Measurement. Measured sizes. Components of a measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction. Recapitulation of the necessary notions from previously studied subjects.Protectia muncli. 2. Free vibrations without damping in systems with a degree of freedom. 3. Free damping vibrations in systems with a degree of freedom. 4. Forced vibrations systems with a degree of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 6. Forced vibrations without damping in systems with	differential equations. 3.Studious vibration		
analysis. 4. Free damp Vibration. Forced vibration damping. Study of vibration damped using the complex form of spinning vectors. Head. 4 Vibration of continuous systems. Longitudinal vibrations of straight bars. Turning vibrations of straight bars of circular cross section. Bending vibrations. The Holzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration measurement. Measured sizes. Components of a measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction.Recapitulation of the necessary notions from previously studied subjects.Protectia muncii. 2. Free vibrations without damping in systems with a degree of freedom. 3. Free damping vibrations in systems with a degree of freedom. 4. Forced vibrations in systems with a degree of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 6. Forced vibrations without damping in degree of vibrations without damping in degree of vibrations without damping in degree of freedom. 6.	study without damping using modal		
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damped using the complex form of spinning vectors. Head. 4 Vibration of continuous systems. Longitudinal vibrations of straight bars. Turning vibrations of straight bars. Turning vibrations of straight bars of circular cross section. Bending vibrations of straight beams. Head. 5 Approximate methods in the study of vibrations. The Holzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration measurement. Measured sizes. Components of a measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction.Recapitulation of the necessary notions from previously studied subjects.Protectia munci. 2. Free vibrations without damping in systems with a degree of freedom. 3. Free damping vibrations in systems with a degree of freedom. 4. Forced vibrations in systems with a degree of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 6. Forced vibrations without damping in systems of difference in the subject spectration is systems with the finite number of degrees of freedom. 7. Free vibrations without damping in systems with the subject spectrations in systems with a degree of freedom. 5. Free vibrations without damping in systems with the finite number of degrees of freedom. 6.	vibration damping. Study of vibration		
spinning vectors. Head. 4 Vibration of continuous systems. Longitudinal vibrations of straight bars. Turning vibrations of straight bars of circular cross section. Bending vibrations of straight beams. Head. 5 Approximate methods in the study of vibrations. The Holzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration measurement. Measured sizes. Components of a measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction.Recapitulation of the necessary notions from previously studied subjects.Protectia muncii. 2. Free vibrations without damping in systems with a degree of freedom. 3. Free damping vibrations in systems with a degree of freedom. 4. Forced vibrations in systems with finite number of degrees of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 6. Forced vibrations without damping in systems with	damped using the complex form of		
continuous systems. Longitudinal vibrations of straight bars. Turning vibrations of straight bars. Turning vibrations of straight beams. Head. 5 Approximate methods in the study of vibrations. The Holzer-Tolle method. Transfer matrix method. Matrix iteration method. The Rayleigh method. Head. 6 Vibration measurement. Measured sizes. Components of a measurement system. Vibration generators. Vibration caps. Measuring systems. The content of the seminar or practical works: 1. Introduction.Recapitulation of the necessary notions from previously studied subjects.Protectia muncii. 2. Free vibrations without damping in systems with a degree of freedom. 3. Free damping vibrations in systems with a degree of freedom. 4. Forced vibrations in systems with a degree of freedom. 5. Free vibrations without damping in systems with finite number of degrees of freedom. 6. Forced vibrations without damping in systems with	spinning vectors. Head, 4 Vibration of		
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systems with linite humber of degrees of	systems with finite number of degrees of		
freedom. Application work. 7. The dynamic	freedom. Application work. 7. The dynamic		
absorber. 8. Vibrations in continuous	absorber. 8. Vibrations in continuous		
systems. 9. Approximate methods in the	 systems. 9. Approximate methods in the		

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			study of vibrations.	
			Finite Element Analysis I	
			Course content:	
			1. Generalities on Finite Element Analysis.	
			2. Shift method used at bars. 3. Finite	
			element method, 4. Typical types of finite	
			elements 5 Applications in using the finite	
			element method	
			The content of the seminar or practical	
			works:	
			1. Initiation in the use of finished elements	
			software and the COSMOS finite element	
			package, 2. Study of bar-shaped	
			structures. 3. Study of plate-shaped	
			structures, 4. Study of molded structures	
	3-rd Year	2	with boards and bars.	5
	0.00.000		Biomechanics	
			Course content:	
			Introduction to Biomechanics object of	
			study terminology aspects	
			basic biomechanics: sadittal frontal and	
			transverse reference systems: kinematic	
			aspects of the moving anatomical	
			sogments: static and dynamic balance	
			Basic Aspects of Apatomy and Dhysiology:	
			Basic Aspects of Anatomy and Physiology,	
			the transformation of the accomply of CT	
			the transformation of the assembly of CT	
			sections into 3D surfaces that delimit	
			tissues according to their densities.	
			Biomechanics of the osteo-articular	
			system; bone; cartilage;	
			ligament, joint. Biomechanics of the	
			muscular system; locomotor movement;	
			types	
			bone lesions, muscle. Anthropometry; the	
			proportion of human body segments, mass	
			centers by percentages.	
	3-rd Year	2	Seminar or Practical Content:	3

			Using the lessons taught at the course and	
			3D scanning and finite element analysis.	
			the stress states of the bone and articular	
			system are analyzed. Making models with	
			3D finishes for bones and teeth The	
			calculation of strength and stability of long	
			hones (femur	
			humerus) with a custom load for each	
			student Calculation	
			Applied Electronics	
			Course content:	
			Somiconductor electrical conduction	
			concepts Electronic Components: Diodes	
			Bipolar transistors Unipolar transistors	
			Special transistors. Onipola transistors,	
			General properties and features of the	
			amplifiers AC Amplifiers (voltage	
			amplifiers nower amplifiers) DC nower	
			amplifiers Negative reaction to amplifiers	
			and its consequences Perational	
			Amplifiers Oscillators PEDPESSOPS	
			NOT MADE OF POW/EP Ope-phase	
			single-phase rectifiers Single-phase	
			single-phase rectifiers with resistive load	
			Single-phase rectiners with resistore with	
			resistive load Re-straining the filtered	
			voltage Three phase rectifiers	
			FLECTRONIC STABILIZERS Parameters	
			of stabilizers Parametric stabilizers	
			Reacting stabilizers Integrated voltage	
			stabilizers REDRESSES COMBINED BY	
			MICE POWER Vertical and Horizontal	
			Command Principle Specialized cascades	
			for thyristor arid control COMBINATION	
			AND SECVENTIAL LOGIC CIRCUITS	
	3-rd Year	2	Elementary logical functions Eurodamental	3
	3-rd Year	2	Elementary logical functions. Fundamental	3

			relationships in logic algebra. Logical	
			airquita Integrated logic aigebra. Logical	
			Circuits. Integrated logic circuits.	
			Combined Logic Circuits. Sequential	
			sequential logic circuits. APPLICATIONS	
			OF COMBINATION AND SECVENTIAL	
			LOGIC CIRCUITS. Encoders and	
			decoders. Electronic counters. Numeric-	
			Analog Converters. Analog-Numeric	
			Converters. Memory circuits. Structure of	
			a microprocessor and a microcomputer.	
			The content of the seminar or practical	
			works:	
			1. Measuring and control devices specific	
			to the electronics lab (cathodic	
			oscilloscope, electronic voltmeter, signal	
			generator, etc.). 2. Photoelectric elements	
			3. Bipolar and unipolar transistor. 4. AC	
			signal amplifiers for small signals.	
			Operational Amplifiers. Single-phase	
			single-phase rectifiers and filters	
			Rectifiers Ordered 6 Continuous voltage	
			stabilizers 7 Combined logic circuits	
			Lifting and Conveying Machines	
			Course content:	
			Course content.	
			General theory and specific organs of	
			anuing and transporting installations - Litting	
			equipment specific to various fields of	
			activity Ancillary equipment	
			Exploitation of transport equipment	
			Norms S.S.M.	
			Content of the seminar or practical	
			works:	
			Knowledge and assimilation of the specific	
			parts of the lifting and transport equipment	
			using documentation	
			Specific Technical Consultations and Use	
			of ISCIR Standards and Standards.	
	3-rd Year	2	Drawing up specific projects based on	1

			design themes specific to the course	
			theme.	
			Internal-combustion engines The course	
			hours and papers undertake a theoretical	
			and experimental study of the thermo-	
			dynamic-mechanical and mechanical	
			processes, in order to optimize them, the	
			mechanical functioning characteristics, a	
			study that allows the graduates to handle	
			the design, testing, exploitation of the ICE	
			with different destinations.	
			Course Content	
			Presentation, classification and	
			composition of ICE. Power plants with	
			ICE. Operation, actual operating patterns	
			and operating regimes of the ICE. Ideal	
			Thermodynamic Processes from ICE.	
			Ideal cycles of ICE. The fluids used for the	
			operation of ICE. The gas change	
			processes at ICE. The compression	
			process. Formation of fuel mixture and	
			combustion. The process of relaxation.	
			Characteristic parameters of ICE.	
			Overcharging ICE. Static operating	
			characteristics of ICE. Thermal balance	
			sheet of ICE. The power plant of ICE.	
			Ignition system of Spark ignition engine.	
			The supply system of Compression	
			ignition engine.	
			Application Content	
			Types of ICE and energy installations with	
			ICE. Operation ICE of cars. Construction	
			of mobile and fixed parts of the engine.	
			Dismantling and mounting, determining	
			the main dimensions of ICE. Construction	
			of mechanisms and auxiliary installations	
			of ICE (distribution, supply, ignition,	
	3-rd Year	2	lubrication, cooling, supercharging,	3

			starting). Experimental determination of	
			the functional characteristics of supply:	
			external characteristic, characteristic of	
			propulsion characteristic of mechanical	
			loss.	
			<b>Optimization in Mechanical Engineering</b>	
			Course content:	
			1. Introduction. Formulation of optimization	
			problems. Classification of optimization	
			issues. Matrix differential calculus	
			elements. Multiple convex. concave	
			functions and convex functions. Optimal	
			conditions, 2. Optimization algorithms for	
			unrestricted issues. Calculate the length of	
			the step Determining search directions	
			3 Transform optimization issues Sign	
			restrictions Simple Edge Restrictions	
			Linear restrictions 4 Problems with linear	
			restrictions Issues with equality	
			restrictions. Allowable directions. Optimal	
			conditions of order one General	
			procedure for colving Problems with	
			inequality restrictions. Optimal conditions	
			General precedure for solving Updating	
			the set of active restrictions. Criteria for	
			accessing convergence 5 Problems with	
			assessing convergence. 5. Froblems with	
			of order one low gradient methods	
			Constally reduced gradient methods.	
			Multipritorio optimization Problem	
			formulation Using outboold functions	
			Light Demote Eurotions Effective	
			Osing Remote Functions. Effective	
			solutions. Sorting criteria. Programming	
			purpose. 7. Optimizing structures.	
			Particularities of optimizing structures.	
			variables, objective functions and	
	0	0	restrictions 8. Reanalysis methods. Direct	
	3-rd Year	2	methods. Using the reverse matrix. The	3

			<ul> <li>substructure technique. Iterative methods.</li> <li>Approximate methods. Low Base Method.</li> <li>Serial development. 9. Methods for solving many variable problems. General presentation. Decomposition methods.</li> <li>Methods for optimizing structure reliability.</li> <li>The content of the seminar or practical works:</li> <li>1. Optimize bar-based structures using spreadsheet programs. 2. Optimization of</li> </ul>	
			bar-shaped structures using finite element method 3. Optimization of plate structures using finite element method.	
			Course content: 1. Introduction Elastoplastic deformations. Perspectives of Nonlinear Calculus. Material models. Numerical approach to elasto-plasticity problems. Elasto-plastic	
			constitutive equations. Generalized method of finite elements. Variational principles and integral forms. 2. Single- dimensional elastic-plastic request. Axial request. The elastic-perfect plastic pattern.	
			hardening. Elastoplastic model with isotropic hardening. Elastoplastic model with mixed hardening. Expression of hardening parameters by stress or deformation. The principle of maximum plastic dissipation.	
			Using convex optimization. Solving elastoplastic problems by finite element method. 3. Elasto-plastic request of bars The elementary approach of the plastic design of the bars.	
	3-rd Year	2	elastoplastic Timoshenko beam. Finished beam, cubic, Euler Bernoulli and Timoshenko. The RSBM bar element.	3

			Plastic node method (PNM). 4. Elasto-	
			plastic plate request. Bending of plates.	
			Finite elements of the board. Elastoplastic	
			calculation of plate systems. 5. Three-	
			dimensional plasticity. Notations.	
			Mechanics of Continuous Environments.	
			Elasto-plastic behavior. Plasticity J2.	
			Variant formulations used in elasticity and	
			plasticity. Potential thermodynamics and	
			plastic dissipation. Using the finite element	
			method	
			The content of the seminar or practical	
			works:	
			1 The elasto-plastic one-dimensional	
			application Analytical problem solving 2	
			Elasto-plastic request of bars Analytical	
			and numerical solving of problems 3	
			Elastic-plastic plaque request Numerical	
			problem solving 4 Three-dimensional	
			elastoplastic request Numerical problem	
			solving	
			Practical Training	
			The content of the seminar or practical	
			works	
			1 Models of complex structures and	
			substructures with the finite element	
			method using specialized programs (in	
			modeling are used all types of finite	
			elements studied at the disciplines	
			Analysis with finite elements I Resistance	
			of materials III Statics stability and	
			dynamics Structures Optimizations in	
			Mechanical Engineering) 2 Estimation of	
			stress state by the resistive electrical	
			tensometry method (students learn how to	
			choose the tensometric marks and	
			tensometric rosettes identify the areas	
	3-rd Year	2	where they can be glued, they effectively	3
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			add soldering technology, learn how to	
			handle the acquisition equipment). 3.	
			Practice Colloquium - Ending the Activity	
			and Granting the Qualification	
			Statics and structures stability	
			Course content:	
			Statics of structures Preliminary elements	
			The stiffness matrix for a structural	
			element Transforming loads from the	
			structure element into loads at the nodes	
			Matrix of rotation. The global axle system	
			Assembling matrices to obtain equilibrium	
			Assembling matrices to obtain equilibrium	
			Computational hypotheses Freedom	
			degree Critical force Loss of stability	
			modes Aspects of stability of elastically	
			ambedded bars in the extremities	
			Continuous Room Stability Analysis on	
			Digid Supports Robavior of comprossed	
			Rigid Supports. Benavior of compressed	
			stability in the plastic field. Scrand order	
			stability in the plastic field. Second order	
			calculation by inflite element method. The	
			sumess matrix of the innite element of the	
			The force disclosement relationship for	
			The force-displacement relationship for	
			structures. Methods for determining the	
			solution in the second order calculation.	
			Applications on the 2nd order calculation.	
			Bar System Stability Study Using Finite	
			Element Method. The stiffness matrix of	
			the bar element in the stability calculation.	
			Bars articulated at the ends for flat	
			structures. Embedded bar at the ends for	
			flat structures. The articulated bar at the	
			ends of the space structures. The	
			recessed bar at the ends for spatial	
			structures. Practical solving of the stability	
	3-rd Year	2	equation. Generally stiffness matrices	4

4-th Year       1         reduced. The symmetrical form of the stability equation. Applications for stability analysis of bar systems using ABAQUS / Comos finite element programs.         The content of the seminar or practical work:         Laboratory:       Introduction, presentation, basics of Mathicad program Analysis of the stability of a plane structure using the Mathicad program Static analysis of the stability of a plane structure using the Mathicad program Static analysis of the stability of a spatial structure using the program Applications for the 2 and order calculation Analysis of the stability of a spatial structure using the program ABAQUS / Cosmos program ABAQUS / Cosmos.         Finite Element Analysis II       Course content:         1. Review. 2. Assembling the system of finite element method equations. Element stiffness matrix and the global external forces vector. Determination of the forces on the element. Assembling the global stiffness matrix and the global external forces vector. Determination of the solution.         9. Non-linear geometric calculation. 4. Non-linear geometric calculation. 4. Non-linear geometric calculation. 5. Nonlinear physical calculation. 5. Nonlinear systems: implementation on the calculator. 7. Flat and spatial bar systems: implementation on the Calculator. 9. Implementing on the calculator. 9. Implementing on the calculator. 9. Implementation on the Calculator. 9. Implementation on the the calculator. 9. Implementation on the calculator. 10. The implementation on the calculator. 10. The implementation on the calculator. 10. The implementation on the calculator.					
stability equation. Applications for stability analysis of bar systems using ABAQUS / Cosmos finite element programs.         The content of the seminar or practical work:         Laboratory: Introduction, presentation, basics of Mathcad program Applications for the bar systems using the ABAQUS / Cosmos program Applications for the 2nd order calculation Analysis of the stability of a plane structure using the bar systems using the ABAQUS / Cosmos.         Finite Element Analysis of the stability of a spatial structure using the program Applications for the 2nd order calculation Analysis of the stability of a spatial structure using the program ABAQUS / Cosmos.         Finite Element Analysis of the stability of a spatial structure using the program ABAQUS / Cosmos.         Revew. 2. Assembling the program ABAQUS / Cosmos.         Revew. 2. Assembling the system of finite element method equation. Element stiffness matrix. The vectors of the forces on the element Assembling the global external forces vector. Determination of the solution. 3. Linear-relastic calculation. 4. Non-linear geometric calculation. 4. Non-linear geometric calculation. 4. Non-linear geometric calculation. 4. Non-linear and spatial bar systems: implementation on the Calculator. 9. Implementation on the calculated morks:         1. The implementation on the computer of the finite element method of the artioutated atrian difference sy				reduced. The symmetrical form of the	
analysis of bar systems using ABAQUS / Cosmos finite element programs. The content of the seminar or practical work: Laboratory: Introduction, presentation, basics of Mathcad program Analysis of the stability of a plane structure using the Mathcad program Static analysis of the bar systems using the ABAQUS / Cosmos program Applications for the 2nd order calculation Analysis of the stability of a spatial structure using the ABAQUS / Cosmos Program Applications for the 2nd order calculation Analysis of the stability of a spatial structure using the program ABAQUS / Cosmos. Finite Element Analysis II Course content: 1. Review. 2. Assembling the system of finite element method equations. Element stiffness matrix. The vectors of the forces on the element. Assembling the global stiffness matrix and the global external forces vector. Determination of the solution. 3. Linear-elastic calculation. 4. Non-linear geometric calculation. 5. Nonlinear physical calculation. 6. Oynamic calculator. 7. Flat and spatial bar systems: implementation on the Calculator. Planar and spatial plate systems: implementation on the calculator. Planar and spatial plate systems: implementation on the calculator. 9. Implementing on the calculator. 9. Impl				stability equation. Applications for stability	
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4-th Year       1         The content of the seminar or practical work:       Laboratory: Introduction, presentation, basics of Mathcad program Analysis of the stability of a plane structure using the Mathcad program Applications for the 2nd order calculation Analysis of the stability of a spatial structure using the PACUS / Cosmos program Applications for the 2nd order calculation Analysis of the stability of a spatial structure using the PACUS / Cosmos program Applications for the 2nd order calculation Analysis of the stability of a spatial structure using the PACUS / Cosmos         Finite Element Analysis II       Course content:         1. Review. 2. Assembling the system of finite element method equations. Element stiffness matrix. The vectors of the forces on the element. Assembling the global stiffness matrix and the global external forces vector. Determination of the solution. 3. Linear-elastic calculation. 4. Non-linear geometric calculation. 6. Nynamic calculation. 7. Flat and spatial plate systems: implementation on the Calculator. 9. Implementing on the Calculator. 9. Implementing on the Calculator. 9. Implementation on the Calculator. 10. Implementation on the Calculator. 9. Implementation on the Calculator. 9. Implementation on the Calculator. 4. Northine elements. 2. Implementation on the 4.				Cosmos finite element programs.	
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			computer of the finite element method of	
			flat bar systems. 3. The practice of	
			calculating the structures made of bars. 4.	
			The practice of calculating the structures	
			made of boards. 5. Nonlinear geometry	
			calculation practice. 6. Physical Nonlinear	
			Practice. 7. Dynamic computing practice.	
			Management and Marketing	
			Course Content:	
			1. Introductory Elements. 2. Presentation	
			of the conceptual framework of project	
			management. 3. Persons engaged in	
			project management. 3.1. Categories of	
			people involved in projects. 3.2. Selection	
			of the project manager. Skills and abilities	
			3.3. Managing and managing the project	
			team. 3.4. Methods of organizing project-	
			oriented activities. 4. Pragmatic approach	
			to project plans 4.1. Establishing the	
			methods and tools required by the project.	
			4.2. Structure of decomposition work 4.3.	
			Structured approach to project	
			management. 5. Cost control and	
			budgeting of projects 6. Methods of	
			evaluation and analysis of investment	
			projects. 6.1. The problem and the	
			specificity of the investment project	
			evaluation methods. 6.2. Specificity and	
			role of financial assessment 6.3. The	
			specificity and role of economic	
			assessment. 7. Monitoring and control of	
			projects. 7.1. Planning - monitoring -	
			control cycle 7.2. Data collection and	
			reporting. 8. Contracting and Acquisition	
			8.1. Purchasing system cycles 8.2.	
			Specific, national and European	
			legislation. 9. Project management in the	
	4-th Year	1	information age. 9.1. Project management	3

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available       to project managers. 10.         Techniques of internal and external communication.       Content of seminar or practical works:         Laboratory: Critical road method and PERT diagrams. 2. Pay-back method 3.         Method based on the rate of return (internal rate of return). 4. Tools used in project management: Work Breakdown Structures (WBS). 5. Tools used in project management: Work Breakdown Structures (WBS). 5. Tools used in project with specialized software (MS Project Management, Primavera Project Planner, MS Excel)         Contact Mechanics       Course content:         1. The normal contact of the elastic bodies as the problem of spatial elasticity. Resolving space elasticity issues with potential travel functions. 2. Problem of the elastic semisposition driven by a task normally concentrated. The problem of the slift punch pressed on a resilient semapholic with a normal force. 3. The theory of contact of solid bodies with simple geometry. 4. The contact state of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general contact of solid bodies with simple				information system 9.2. Internet tools	
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distributed load. The problem of the stiff punch pressed on a resilient semaphotic with a normal force. 3. The theory of contact of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 4. The contact state of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				elastic semisposition caused by a normal	
4-th Year 1 punch pressed on a resilient semaphotic with a normal force. 3. The theory of contact of solid bodies with simple geometry. 4. The contact state of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				distributed load. The problem of the stiff	
with a normal force. 3. The theory of contact of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 4. The contact state of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				punch pressed on a resilient semaphotic	
4-th Year 1 contact of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 4. The contact state of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				with a normal force. 3. The theory of	
4-th Year 1 theory. Computational relations for the geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				contact of two elastic bodies - Hertz	
4-th Year       1       hertzian contact of solid bodies with simple geometry. 4. The contact state of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface.				theory. Computational relations for the	
4-th Year 1 geometry. 4. The contact state of two elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general				hertzian contact of solid bodies with simple	
4-th Year 1 elastic bodies - Hertz theory. elastic bodies - Hertz theory. Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				geometry. 4. The contact state of two	
4-th Year 1 Computational relations for the hertzian contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				elastic bodies - Hertz theory.	
4-th Year 1 contact of solid bodies with simple contact of solid bodies with simple geometry. 5. Voltage state in the general case of the elliptical contact surface. 4				Computational relations for the hertzian	
4-th Year 1 geometry. 5. Voltage state in the general				contact of solid bodies with simple	
4-th Year 1 case of the elliptical contact surface. 4				geometry. 5. Voltage state in the general	
		4-th Year	1	case of the elliptical contact surface.	4

		Voltage status in case of initial contact on	
		a line. Influence of tangential forces on the	
		voltage state. 6. Numerical development in	
		contact analysis using the finite element	
		method: Lagrange multipliers method,	
		penalty methods, combined methods,	
		direct methods, mortar methods. 7.	
		Numerical development in the analysis of	
		the contact using the finite element	
		method: comparisons between methods	
		on simple systems. 8. Solving contact	
		problems with company programs that	
		have implemented the contact element. 9.	
		Consider friction between bodies in	
		contact. 10. Adherent contact. Influence of	
		surface roughness in contact. 11. Contact	
		Algorithms, 12. Difficulties in shaping the	
		contact between the bodies: specific	
		problems in the case of unilateral contact,	
		problems in determining the shape and	
		dimensions of the contact area, uneven	
		contact (combined contact areas -	
		adherent and slip), parts of the same body	
		that come in contact, of "polygon" -	
		numerical interpenetration of the bodies.	
		13. Elastoplastic contact problems. 14.	
		Non-linear behavioral contact bodies.	
		The content of the seminar or practical	
		works:	
		1. Verification of the analytical expressions	
		of stresses within the elastic semisposition	
		driven by a normal concentrated load	
		using the finite element method. 2. Bars in	
		unilateral contact conditions (beams on	
		discontinuous elastic medium and beams	
		on offset supports). 3. Friction contact	
		between plates (2D modeling). 4. Study of	
	 	 arched sheets with finite elements (2D	

			modeling), 5. Dynamic analysis of a	
			Coulombian damping system 6 Hertzian	
			contact between a cylinder and a rigid	
			plane Contact hertzian between two	
			spheres 7 Rubber cylinder pressed	
			between two plates Project Themes: 1	
			The contact stress voltages in polygonal	
			connections (PC3 PC4) based on the	
			transmitted torque and the type of joint 2	
			The contact stress curve in the friction	
			inite based on the transmitted torque and	
			joints based on the transmitted torque and	
			the imposed geometry	
			Mechanics, Construction and Design of	
			Content of the course:	
			1. General principles regarding the	
			introduction of structures. Introduction.	
			Design Methodologies. Modern design	
			methods. Specific design methods. Design	
			systems (design software). 2. Mechanics	
			of spaceframe engineering structures. 2.1	
			Modeling of structural elements: bars,	
			frames, grids, slabs, planes, the additional	
			slab used in the design of metallic	
			structures composed of planes. Modeling	
			links. 2.2 Design engineering based on	
			assumed risk. 2.3 Probabilistic approach	
			to tasks. 3. Construction, design and	
			calculation of engineering frames of spatial	
			frames (Marine drilling units). 3.1	
			Construction of marine structures.	
			General. Classification of marine	
			structures. Hvdrocarbon extraction	
			technologies. Fixed marine structures	
			Mobile marine structures:	
			semisubmersible. submersible UFM	
			class 3.2 Calculation of marine structures	
	4-th Year	1	Methods of calculation: static calculation	1
			Mobile marine structures: semisubmersible, submersible, UFM class. 3.2 Calculation of marine structures.	
	4-th Year	1	Methods of calculation: static calculation,	1

			dynamic calculation (vibrations). Task	
			modeling: waves, wind, sea currents, ice,	
			earthquakes. 4. Specific rules and	
			regulations for ISSC design (International	
			Ship and Offshore Structures Congress)	
			Organization and purpose of ISSC.	
			Specific to ISSC's IV-Design Methods.	
			ISSC Recommendations on Marine	
			Structures Design, Use of Eurocodes,	
			Romanian SR-EN standards and	
			international rules and regulations 5	
			Project management	
			Content of the seminar or practical	
			worke:	
			Laboratory: 1 Determination of the	
			dimensions of the marine structure	
			apparding to the design theme 2	
			Determination of coloulation tasks 2	
			Medaling the marine structure with finite	
			Modeling the marine structure with linite	
			elements. 4. Static and dynamic	
			calculation of marine structure. 5.	
			Interpretation of structure response. 6.	
			Support the project.	
			Modeling and Simulation of Mechanical	
			Systems Dynamics	
			Course content:	
			General theorems in mechanical systems	
			dynamics: Theorems	
			impulse and kinetic momentum (torsion	
			theorem), kinetic energy theorem,	
			preservation of mechanical energy.	
			Particular movements of mechanical	
			systems: Moving rigid with fixed axis. rigid	
			point rigid and rigid in parallel plan motion	
			Application of Differential Principles in the	
			Dynamics of Mechanical Systems	
			Dynamics: D'Alembert Principle Virtual	
	4-th Year	1	Mechanical Work Principle and Virtual	4
			moonamoa work i moipic and virtual	1 -

percussions: Elastic and plastic clashes, restitution coefficient, Carnot theorem. Gyroscope and gyroscopic effect. Dynamics of variable mechanical mechanical systems Vibration of systems with a finite number and infinite degrees of freedom: Free vibrations; Damaged vibrations; Forced vibration, resonance;
restitution coefficient, Carnot theorem. Gyroscope and gyroscopic effect. Dynamics of variable mechanical mechanical systems Vibration of systems with a finite number and infinite degrees of freedom: Free vibrations; Damaged vibrations; Forced vibration, resonance;
Gyroscope and gyroscopic effect. Dynamics of variable mechanical mechanical systems Vibration of systems with a finite number and infinite degrees of freedom: Free vibrations; Damaged vibrations; Forced vibration, resonance;
Dynamics of variable mechanical mechanical systems Vibration of systems with a finite number and infinite degrees of freedom: Free vibrations; Damaged vibrations; Forced vibration, resonance;
mechanical systems Vibration of systems with a finite number and infinite degrees of freedom: Free vibrations; Damaged vibrations; Forced vibration, resonance;
with a finite number and infinite degrees of freedom: Free vibrations; Damaged vibrations; Forced vibration, resonance;
freedom: Free vibrations; Damaged vibrations; Forced vibration, resonance;
vibrations; Forced vibration, resonance;
I Parametric and nonlinear vibrations.
vibrating machines: Narrow bandwidth and
bandwidth processes, dynamic response
to forces
non-harmonic excitation: Dynamics of
vibratory machines support linear elastic
elements: Vibratory machines support rigid
ioints. Modeling of torsional vibrations of
mechanical systems for rotation
movement.
Content of the seminar or practical
works:
Recapitulation of fundamental notions in
the dynamics of mechanical systems).
Introduction to the Octave or Matlab
programming language. Applications.
Instructions and control functions.
Numerical calculation. Functions for data
analysis. Common mathematical
functions. Applications. Graphics in
Matlab, 2D and 3D elementary and special
charts. Interactive graphical interfaces.
Applications. Solving mechanical
engineering problems using Octave or
Matlab (low complexity). Applications.
Solving mechanical engineering problems
using Octave or Matlab (medium
complexity). Applications. Mechanical
engineering problems solved using Octave

			or Matlab. Individual themes. Applications.	
			Modeling system vibrations with a finite	
			number of degrees of freedom, rigid	
			systems: Applications. The project	
			includes:	
			- Numerical implementation in Octave or	
			Matlab of some Mechanical problems	
			solved in the Mechanics course: - Applied	
			work Nr. 1 - Applicative work Nr. 2 (variant	
			1, 2, 3) - Numerical solving and	
			implementation of a material point	
			dynamics problem	
			Static and Dynamic Stability of	
			Structures II	
			Course content:	
			Introduction to building dynamics.	
			Introductory notions. Object of Structure	
			Dynamics. Dynamic action. Vibrations of	
			elastic structures. Vibration damping. The	
			opportunity of dynamic structure	
			calculation. The dynamic response of a	
			structure. The dynamic response of	
			systems with a degree of freedom.	
			Schematic of the structure. Determining	
			the inertial and elastic characteristics of	
			the calculation scheme. Mechanical	
			model. The vibration equation produced by	
			any disruptive force. Unstimulated free	
			vibrations. Forced vibrations unabsorbed.	
			Dynamic response of the structure to the	
			action of a finite impulse. H. Dynamic	
			response to the action of a disturbing force	
			P (t). The dynamic response to the action	
			of a harmonic force applied to the mass.	
			The dynamic response to the action of	
			forces that are not applied to the mass.	
			The dynamic response to the action of a	
	 4-th Year	1	mobile force. The dynamic response to the	4

		shock. The influence of damping on the	
		dynamic response of structures.	
		Recapitulative observations. Dynamic	
		response of systems with finite number of	
		degrees of freedom	
		Schematic of the structure. Determining	
		the inertial and elastic characteristics of	
		the calculation scheme. Matrix differential	
		equation of elastic vibrations Free	
		unabsorbed vibrations. Normal modes of	
		vibration Determining normal vibration	
		modes Method of model analysis	
		Determination of the dynamic response	
		caused by the displacements and initial	
		speeds Determining the dynamic	
		response produced by disturbing forces	
		some The influence of damping on the	
		dynamic response produced by some	
		forces Dynamic response of systems with	
		"n" degrees of freedom produced by	
		periodic forces Dynamic response of	
		distributed mass systems Structure	
		diagram Dynamic response of the straight	
		bar Differential equation of the transverse	
		vibrations of a distributed beam bar Free	
		vibrations of the bar with Distributed mass	
		Differential equation of normal vibration	
		modes and its integration Determination of	
		normal vibration modes Transfer matrix	
		Determination of the dynamic response	
		caused by the initial displacements and	
		velocities Determination of the dynamic	
		response caused by the action of the	
		disturbing forces The finite element	
		method applied in the calculation dynamic	
		method applied in the calculation dynamic structure of the structures Structure	
		method applied in the calculation dynamic structure of the structures Structure discretization Static case Dynamic case	

Transformation relations from element to structure Compatibility relations Structure rigidity matrix Structure inertial matrix Differential matrix equation of the structurii. Succession of computational operations. The content of the seminar or the practical work: Laboratory: Dynamic analysis of bars	
structure Compatibility relations Structure rigidity matrix Structure inertial matrix Differential matrix equation of the structurii. Succession of computational operations. <b>The content of the seminar or the</b> <b>practical work:</b> Laboratory: Dynamic analysis of bars	
rigidity matrix Structure inertial matrix Differential matrix equation of the structurii. Succession of computational operations. The content of the seminar or the practical work: Laboratory: Dynamic analysis of bars	
Differential matrix equation of the structurii. Succession of computational operations. The content of the seminar or the practical work: Laboratory: Dynamic analysis of bars	
structurii. Succession of computational operations. The content of the seminar or the practical work: Laboratory: Dynamic analysis of bars	
operations. <b>The content of the seminar or the</b> <b>practical work:</b> Laboratory: Dynamic analysis of bars	
The content of the seminar or the practical work: Laboratory: Dynamic analysis of bars	
practical work: Laboratory: Dynamic analysis of bars	
Laboratory: Dynamic analysis of bars	
using the ABAOUS / SolidWorks / Cosmos	
program Dynamic plane analysis using the	
ABAOLIS / SolidWorks / Cosmos program	
Dynamic spatial analysis using the	
ABAOLIS / SolidWorks / Cosmos program	
Dynamic plate analysis using the program	
ABAOLIS / SolidWorks / Cosmos	
ADAQUS / SUIUVUIKS / CUSIIIUS.	
Composite Structures	
Course content:	
General information on composite	
materials. Definitions, advantages and	
disadvantages of composite materials,	
classifications, fields of use, raw materials	
used, fibrous composite materials, particle	
reinforced composite materials, composite	
layered materials, properties of	
composites according to the matrix. Levels	
of analysis, topological coding,	
engineering dimensions, general	
relationships between stresses and	
deformations. Analysis levels,	
determination of engineering constants by	
microstructural analysis, evaluation of	
physical and elastic properties of the	
lamine with the rule of the mixture,	
lamine with the rule of the mixture, topological coding, relationships between	
lamine with the rule of the mixture, topological coding, relationships between stresses and deformations, Hooke's	
lamine with the rule of the mixture, topological coding, relationships between stresses and deformations, Hooke's generalized law, variation of	

			notions of breaking mechanics and	
			theories on the boundary states of	
			composite materials. Study of deterioration	
			of composite materials macromecanic	
			resistance parameters additional	
			parameters of resistance macromecanic	
			breaking criteria micro-mechanical	
			breaking criteria, filoto-filecitatical	
			orthetropic lemine with continuous fibera	
			Unidirectional Computational equations in	
			onionectional. Computational equations in	
			plane state of tension, Onotropic lame	
			resistance. General Theory of Layers.	
			Elements from the theory of elasticity of	
			the layers, specificities of the rogity matrix	
			for several types of laminates. Methods of	
			analysis of composite materials. Analytical	
			methods, numerical methods,	
			experimental methods	
			Content of the seminar or practical	
			works:	
			Project - Levels of analysis, topological	
			coding and determination of engineering	
			sizes for different structures made of	
			composite materials. Finite element	
			analysis of a slab made of composite	
			layered material. Numerical analysis of the	
			static behavior of a complex structure	
			made of composite materials. Presentation	
			and evaluation	
			Collapse of Mechanical Structures	
			Course content:	
			Compressed bar buckling. Ultimate	
			strength of compressed bars. Placing the	
			flat plates. Ultimate Resistance of Flat	
			Plates Enhanced unidirectional rigid	
			flooring, Last resistance. Enhancement of	
			two orthogonal rigidized sheets. Last	
	4-th Year	2	resistance.	2
	4-th Year	2	resistance.	2

			The content of the seminar or practical	
			works:	
			Compressed bar buckling - analytical	
			calculation. Modeling and finite element	
			analysis of the buckling phenomenon of a	
			compressed bar. Analytical calculation for	
			the hinging of a board, simply supported,	
			uniaxially requested.	
			Modeling and finite element analysis in the	
			case of plate plating, simply supported,	
			uniaxial. Analytical calculation for the	
			unilaxial rigidity of a rigid single-sided slab.	
			Modeling and finite element analysis in the	
			case of uniaxial rigid uniaxial rigging,	
			uniaxial. Analytical calculation for the	
			floating of a reinforced slab on two	
			orthogonal directions, uniaxially requested.	
			Modeling and finite element analysis in the	
			case of the rigging of the reinforced slab in	
			two orthogonal directions, uniaxially	
			requested. The project includes: - Stability	
			analysis of a spatial structure using the	
			ABAQUS program Analyze possible	
			measures to increase the stability of	
			structures and to avoid specific failure	
			phenomena Methods of solving, using	
			the finite element method.	
			Graduation project elaboration	
			Content of the seminar or practical	
			papers:	
			Bibliographic documentation. Identification	
			and description of the materials and	
			methods used for the license work.	
			Experimental researches in the field of	
			proposed topic Visits to industrial units for	
			the purpose of collecting data and	
			harmonizing them with the theme of the	
	4-th Year	2	chosen research. Interpretation of results	2

	and their reporting to other results from the			
	literature. Modeling / optimization of the			
	technological process. Making a synthetic			
	presentation of the results			
	Quality Management			
	Quality concept Definitions The concept			
	of quality Characteristics of the quality			
	The new signification of the quality.			
	Evolution of the quality concent			
	Prodution of the human			
	Breakinoughs in evolution of the human			
	society and the quality. Total Quality. The			
	Structure of the industrial organizations.			
	Customers. Suppliers. Staff of the			
	organization. Fundamental processes in			
	Quality Management. Management by			
	policies. Continuous improvement.			
	Intensive training. The management of the			
	processes. Activity in participatory groups.			
	Management of the product / service.			
	Diagnosis of the quality system.			
	Leadership. Quality Instruments. The			
	seven statistic instruments. ISO 9000:			
	2015 norms. General description of ISO			
	9000. The requirements of ISO 9001:			
	2015 for quality management. ISO 9004:			
	2010 Leading an organization to			
	sustainable success. An approach based			
	on quality management. OHSAS 18001:			
	2008 for Occupational Health and Safety			
	Management. OHSAS 18001 norm.			
	General description. Requirements of the			
	health and safety standard at the			
	workplace. Guidelines for integrated			
	management system. Audit and			
	certification of the quality management			
	system. Quality Audit. ISO 19011: 2011.			
	Quality Certification. Certification			
			model.	
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			Experimental Modeling in Mechanical	
			Engineering	
			1. Basic concepts on experimental	
			methods. Terminology - The	
			characteristics of measuring instruments.	
			Calibration. Standards. The general	
			structure of a measurement system. Basic	
			basics for dynamic measurements.	
			Systems Response. 2. Methods of	
			pressure measurement Mechanical	
			methods. Methods based on mechanical -	
			size conversion. Methods based on	
			thermal conductivity of gases. 3.	
			Measurement of displacements and	
			positions. Measuring displacements and	
			positions. Analog transducers. Numeric	
			transducers. 4. Methods of flow	
			measurement Positive displacement	
			method. Flow obstruction method. Method	
			of "resistance to advance" measurement.	
			Electrical methods for variable flow	
			measurement. Optical methods. 5.	
			Methods of temperature measurement	
			Measuring of temperature by mechanical	
			and electrical effects and by measurement	
			of thermal radiation. Temperature	
			measurement in high-velocity gas	
			streams. 6. Methods of measuring	
			movement and vibration. Speed,	
			acceleration, displacement measurement.	
			Measuring the vibration amplitude. Sound	
			measurement. 7. Measurement of forces.	
			General notions. Instrument for measuring	
			of forces. 8. Thermal and nuclear radiation	
			measurement methods. Thermal Radiation	
			Detection. Measurement of emissivity,	
	4-th Year	2	reflectivity and transmissivity of surfaces.	5

	1			
			Measuring solar radiation. Methods of	
			detection and measurement of nuclear	
			radiation. 9. Methods of measuring	
			pollution. Standards on air pollution.	
			Sampling techniques. Measurement of	
			sulfur dioxide. Measurement of	
			combustion products.	
			The content of the seminar or practical	
			works:	
			1 Planning the experiments. The role of	
			uncertainty in experimental	
			measurements Drafting a report Graphic	
			presentation.	
			Oral presentation. 2. Pressure measuring	
			instruments / devices. Applications on	
			calculation of dynamic response and	
			pressure-measuring instrument specific	
			parameters 3 Flowmeters / instruments	
			Calculation of measurement uncertainty of	
			flowmeters and Venturi tube 4. The effect	
			of heat transfer on temperature	
			measurement Determination and	
			and a correction of temperature reading errors	
			Contection of temperature reading enors 5.	
			Seismic tools. Calculating the uncertainty	
			or measuring seismic instruments. 6.	
			Statistical methods for the evaluation of	
			parameters specific to the measurement of	
			nuclear radiation. 7. Calculation of	
			parameters specific to the degree of	
			measurement	
			combustion gases.	
			Modeling and Simulation of Mechanical	
			Systems Dynamics II	
			Course content:	
			Integral principles and their use in the	
			dynamics of material systems: Variational	
			calculus elements; Hamilton principle and	
	4-th Year	2	notions of Hamiltonian mechanics,	2

		canonical transformations; Lagrange	
		space and phase space; Equation of	
		movement in Appel and Routh forms	
		Elements of continuous medium	
		mechanics: Study of stresses and	
		deformations in Cartesian and curvilinear	
		coordinates. Voltage vector, voltage tensor	
		at one point, variance of voltage tensor	
		components in the vicinity of a point,	
		voltage ellipsoid and octahedral voltages.	
		The fundamental equation of elastostatics;	
		the fundamental equation of	
		elastodynamics. Linear elastic medium in	
		non-isothermal conditions: generalities;	
		the effect of temperature variation; the	
		effect of heat propagation. Modeling,	
		simulation in the dynamics of nonlinear	
		systems. The mathematical model in the	
		kinematics of the free rigid. Dimensions	
		that characterize the mass distribution of a	
		rigid solid. Rigid systems, kinematic	
		constraints. Modeling kinematics and	
		dynamics of 2D mechanical systems -	
		introducing kinematic constraints,	
		modeling of cymetics, dynamics modeling	
		- 2D motion rigid motion equations.	
		Introduction to modeling, simulation in	
		robot mechanics, 3D mechanical systems.	
		The content of the seminar or practical	
		works:	
		Analysis of the methods that can be used	
		in solving a complex problem of system	
		dynamics, Convergence of methods from	
		Hamiltonian mechanics to those in	
		mechanics clássica; assessing the	
		advantages and disadvantages of each	
		method; Applications. Solving mechanical	
		engineering problems using Octave sal	

			Matlab (high complexity). Applications. The use of software for modeling and simulation in the dynamics of mechanical systems The project includes: Solving a dynamics problem of rigid systems through the methods of classical dynamics and analytical mechanics - Studying the dynamics of a complex mechanical system - Using several methods in parallel and checking the convergence of methods - Implementation of an individual numerical modeling program of the dynamics problem - Graphical view of the results -	
			NumericalModelingforFluidsMechanicsCourse content:IFundamentals of Numerical Modeling ofI Fundamentals of Numerical ModelingTechniques. Fluid Properties, LagrangeMethod and Euler Method, FundamentalFluidMovement Equations, PotentialMovement,ContinuityDifferentialequations with partialderivatives and their application in fluidmechanics:classification, examples ofclassical equations frommathphysics, initial value issues, andfrontier values.Numerical Fluid Dynamics):numerical meshproblem, mesh meshing,numerical schemes, numerical diffusion,borderconditions, initialconditions,Fluid theory with free surface.DifferentialFormulasandHamiltonian	
	4-th Year	2	Forms in the Study free surface fluid movement: Basic	5

		equations of the classical differential	
		formulation of fluid with free surface.	
		Hamiltonian formulation and decoupling of	
		fluid problem with free surface. Differential	
		functional equations describing fluid	
		movement with the free surface and	
		methods for their numerical meshing.	
		Linear and nonlinear theories of free	
		surface fluid: Airy linear fluid theory with	
		free surface, computational hypothesis,	
		dispersion types. Nonlinear Theories	
		Stokes of the second order and higher	
		order Stokes speed Choidal fluid theory	
		with free surface. The wave and	
		dissipation in fluids (refraction diffraction	
		reflection and	
		fluid dissipation). Spectral Theory of Fluid	
		with Free Surface: Spectral Theory and	
		Fourier analysis, spectrum derived	
		parameters, common theoretical spectra.	
		Rayleigh distribution and statistics in fluid	
		mechanics. Equation of transport	
		advection of a scalar size in a vector field	
		and its application in spectral theory of	
		fluid with the free surface, the Hasselmann	
		equation. III Numerical models for fluids	
		used in the technique. Numerical models	
		for fluid flow modeling: FLUENT, CFX,	
		WAMIT. Numerical models for surface-free	
		fluids: Average phase models (WAM,	
		SWAN), phase calculating models (REF /	
		DIF, FUNWAVE) and circulation patterns	
		(POM, SHORECIRC).	
		Content of the seminar or practical	
		papers:	
		Recapitulation of fundamental notions of	
		fluid mechanics. Interpolation and	
		approximation of data. Integration and	

			derivation of functions Applications	
			Numerical integration of differential	
			equations Applications Time integration	
			of ordinary differential equations	
			Applications Solving differential equations.	
			Applications. Solving unerential equations	
			with partial derivatives. Two-dimensional	
			equation with advection and diffusion.	
			Applications. Application of Finite	
			Difference, Finite Element and Borderline	
			Methods in Fluid Mechanics. Applications.	
			Linear theory of fluid with free surface,	
			fundamental notions, dispersion equation,	
			simplifications. Applications. Simulations	
			with the SWAN model. Evaluation of	
			results. Elements of statistics in fluid	
			mechanics (Rayleigh and Gauss	
			probability distributions). Applications.	
			Spectral theory and Fourier analysis,	
			parameters derived from the spectrum.	
			Applications. Basics of using models in	
			CFDs. Applications with FLUENT / WAMIT	
			models.	
			Welded Structures	
			Course content:	
			Chapter 1 Introduction to metal	
			constructions Fields of use of metallic	
			structures Head 2 Joining and clamping	
			devices according to Eurocode 3 - Head 3	
			Wolded joints, Components, Classification	
			of welded joints. Components. Classification	
			of weided joints. Weiding joints and their	
			choice. Chapter 4. The basic metal. The	
			main factors influencing the properties of	
			metals; Choosing the quality of steel for	
			metal structures; Adding materials for	
			weiding Cap 5. Computational elements:	
			static application calculation of welded	
			joints in the head, in the corner by	
	4-th Year	2	overlapping and in T statically required;	4

		calculus of nodes in constructions from	
		laminated profiles and pipes; calculation of	
		point welded joints; calculation to variable	
		requests. Chapter 6. Effort distribution in	
		welded joints. Chapter 7. Origins of	
		residual stresses in welded structures:	
		methods of determination: residual	
		deformation-classification: methods of	
		determination Heart 8 Full Heart Beam	
		Composition Sizing Exhibit	
		Stiffening Head 9 Grab bar: shaning	
		sizing arinning methods in knots	
		solidarization supporting devices Head	
		10 Metal posts: dimensioning verification	
		colidarity: p frames for industrial balls:	
		frames for cars	
		The content of the seminar or practical	
		works:	
		1 Laboratory presentation Labor	
		protection 2 Choosing materials for a	
		metallic structure, 3. Composition of the	
		full length beam section with variable	
		length dimensions, 4. Check the	
		deformations on the full-beam beam 5	
		Check for deformations at the cheson	
		beam. 6. Establishment of the constructive	
		solution for the girder beams. 7. Check	
		tensions and deformations in the beam	
		bars. 8. Rigidization of metal building	
		elements. 9. Check tensions and	
		deformations in pole structures. 10. Check	
		tensions and deformations in frames. 11.	
		Construction and calculation of welded	
		construction bearings. 12. Study of the	
		behavior of welded joints at simple traction	
		applications. 13. Study of the behavior of	
		welded joints at Bending requests. 14.	
		Study of the behavior of welded welded	

					joints to shear stress	
			_	_	-	_
Mechanical	bachelor, level 6	Heating Systems and			Mathematical Analysis	5
Engineering	from NQF, EQF	Equipment			Course content:	
					Chapter I. Strings and series of real	
					numbers. Convergence of strings and real	
					number series. Convergence criteria.	
					Head. II. Differential calculus. Real	
					variability of real variable function. Taylor's	
					form. Series of powers. Functions of	
					several variables. Limit, continuity,	
					derivability, and differentiability for multi-	
					variable functions Partial derivatives of	
					superior order Extremes free and with	
					links Elements of field theory (gradient	
					divergence rotor) Head III Full	
					calculation Primitive Methods for	
					determining primitives. Integrala definita	
					Incorrect integrations Integral curves of	
					spheres I and II Integrates the curves	
					independent of the road Multiple	
					integrations (double triple surface)	
					Integrations (double, thple, surface).	
					Equations Differential equations of order I:	
					differential equations with separable	
					homogonoous lineer verichles Bernoulli	
					Picceti Lagrange Clairaut Problem of	
					Cauchy Higher linear differential	
					cauchy. Figher inear differential	
					The content of the cominer or prectical	
					The content of the seminar or practical	
			1	4	papers:	
			1-st Year	1	Applications to the coursework topics.	
			i-st rear	1	Course content:	S
					1 The History of Chemistry Development	
					The History of Chemistry Development.	
					Fundamental notions. Classification of	
					chemicals. Aggregation states of matter.	
					Status Transformations. 2. Fundamental	

		Laws of Chemistry. Elements of structure	
		of atoms. 3. Atomic models. Orbital atomic.	
		Quantum numbers. Electronic layers.	
		Electronic substrates. Periodic system of	
		elements. 4. Law of periodicity and	
		properties of elements. Rules for setting	
		oxidation numbers. Electronic	
		configurations of atoms. Chemical	
		connections. The ionic bond. 5. Chemical	
		bonds. The covalent bond. Coordinative	
		link. Metal bond. Intermolecular links. 6.	
		Disperse systems. Classification of	
		solutions. Modes of expression of solution	
		concentrations. Solutions Laws.	
		Suspensions. Colloidal systems. Acid-base	
		reactions (neutralization reactions). PH	
		indicators. Balances in salt solutions. 7.	
		Redox reactions. Types of redox reactions.	
		Series of redox activity. Galvanic cells.	
		Electrolysis. The laws of electrolysis.	
		Applications of electrolysis. Precipitation	
		reactions. Complexity reactions. 8.	
		HYDROGEN. Natural state. Obtaining.	
		Physical and chemical properties. Use.	
		METALS. Natural state. General methods	
		of obtaining and purifying metals. General	
		physical properties of metals. General	
		chemical properties of metals. Alloys. 9.	
		Group 1 of the Periodic System. General	
		characterization of the element and	
		combinations of Group IA elements.	
		Natural state. Obtaining. Physical and	
		chemical properties. Main combinations.	
		Uses. Group 2 of the regular system.	
		General characterization of elements and	
		combinations of Group IIA elements.	
		Natural state. Obtaining. Physical and	
		chemical properties. Main combinations.	

		Uses. 10. GROUP 13 of the Periodic	
		System. General characterization of	
		elements and combinations of elements in	
		Group IVA. ALUMINUM: Natural condition.	
		Obtaining. Physical and chemical	
		properties. Main combinations. Uses.	
		Group 14a (IVA) of the Periodic System.	
		General characterization of elements and	
		combinations of elements in Group IVA.	
		Carbon and Silicon: Natural state.	
		Allotropic forms. Obtaining. Physical and	
		chemical properties. Main combinations.	
		Uses. 11. GROUP 15 of the Periodic	
		System. General characterization of	
		elements and combinations of elements in	
		group VA. Nitrogen and Phosphorus:	
		Natural state. Allotropic forms. Obtaining.	
		Physical and chemical properties. Main	
		combinations. Uses. Group 16 of the	
		regular system. General characterization of	
		elements and combinations of Group VI	
		elements A. Oxygen and Sulfur: Natural	
		state. Allotropic forms. Obtaining. Physical	
		and chemical properties. Main	
		combinations. Uses. 12. GROUP 17 of the	
		Periodic System. General characterization	
		of elements and combinations of elements	
		of group VII A. CLOR: Natural state.	
		Obtaining. Physical and chemical	
		properties. Main combinations. Uses.	
		GROUP 18th. Rare gases (noble) .Style	
		natural. Obtaining. Physical and chemical	
		properties. Main combinations. Uses. 13.	
		Transitional metals: Groups III B - VII B.	
		General characterization. Important	
		combinations. Uses. Group VIIIB (groups	
		8, 9, 10). Fe, Co, Ni: General	
		characterization. Natural state. Methods of	

			obtaining. Physical and chemical	
			properties. Uses 14. GROUP I B. General	
			characterization. Natural state. Methods of	
			obtaining. Physical and chemical	
			properties. Group II uses B. General	
			characterization. Natural state. Methods of	
			obtaining. Physical and chemical	
			properties, uses	
			The content of the seminar or practical	
			works:	
			1. Labor protection in the chemistry lab.	
			Presentation of laboratory work. 2. Modes	
			of expression of solution concentrations	
			(c%, n, m, t, f). Troubleshooting modes. 3.	
			Ways to solve chemistry problems.	
			Applications. 4. Introductory notions in	
			quantitative analytical chemistry. PH	
			measurement. Titration 5. Alkalimetry:	
			Determination of titre, factor and normality	
			of NaOH solution ~ 0.1N. 6. Acidimetry:	
			Preparation of 0.1N HCI solution.	
			Determination of titre, factor and normality	
			of HCI solution ~ 0.1N. 7.Determination of	
			water hardness 8.Gravimetry. Fe Fe in	
			oxide form. 9. Measures to solve chemistry	
			problems. Applications. 10. Introductory	
			notions in qualitative analytical chemistry.	
			Analytical classification of cations and	
			anions. Preliminary analysis of cation	
			dosing. 11. Recognition of Group V	
			cations. 12. Recognition of Group Anions.	
			I. Recognition of Group II Anions.	
			Recognition of Group III anions.	
			13.Measures to solve chemistry problems.	
			Applications. 14. Laboratory colloquium	
	1-st Year	1	Communication	5
			Communication, principles, units and	
			characteristics of communication; the	

			effects of communication, the intelligibility	
			of the message; levels of human	
			communication. The principles of effective	
			communication: clear, complete, concise,	
			concrete, fair, receptive, courteous	
			message. Nonverbal communication.	
			Communication networks. Communication	
			in conflict management. Communication	
			and listening. Presentation of techniques	
			for making oral and written scientific	
			presentations. Formats for presentations.	
			Organization of the presentation. Data	
			integration. Media elements. Structure of	
			technical-scientific works: papers, studies	
			completion, papers and scientific papers,	
			projects. Human-to-human interaction	
			mediated by web and audio-video	
			technologies.	
	1-st Year	1	Sports	2
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	i ot i oui	•	The content of the seminar or practical	2
			The content of the seminar or practical works:	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical	L
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection,	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and	2
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of	2
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles.	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems.	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems. Bilateral games. Developing the rectifying	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems. Bilateral games. Developing the rectifying rate to auditory and visual stimuli. Repeat	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems. Bilateral games. Developing the rectifying rate to auditory and visual stimuli. Repeat kick start and launch from start,	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems. Bilateral games. Developing the rectifying rate to auditory and visual stimuli. Repeat kick start and launch from start, development of the speed of movement	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems. Bilateral games. Developing the rectifying rate to auditory and visual stimuli. Repeat kick start and launch from start, development of the speed of movement through accelerators on variable distances	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems. Bilateral games. Developing the rectifying rate to auditory and visual stimuli. Repeat kick start and launch from start, development of the speed of movement through accelerators on variable distances 20-60m. Educating dynamic strength in	
			The content of the seminar or practical works: 1. Presentation of minimal theoretical content regarding the activity of physical education, training for labor protection, presentation of the objectives and requirements of the discipline, support of the initial tests. 2. Repeat the main methods of football - girls and volleyball girls, known from previous cycles. Positioning in attack and defense systems. Bilateral games. Developing the rectifying rate to auditory and visual stimuli. Repeat kick start and launch from start, development of the speed of movement through accelerators on variable distances 20-60m. Educating dynamic strength in upper, lower limbs, abdomen and trunk by	

			workshops. 3. Evaluation with specific	
			scores, the level of movement speed	
			development and segmental muscle	
			strength. 4. Presentation of the topic	
			approached in semester 2. Readiness to	
			effort. Sports Games, 5. Strengthen the	
			main elements and technical procedures	
			specific to sports games Their repetition in	
			adversity in a bilateral game Developing	
			the elements of coordinating capacity -	
			rhythm precision static and dynamic	
			halance spatio-temporal orientation	
			combination of movements kinesthetic	
			discrimination ambidextructure agility	
			Education of acrobic and mixed resistance	
			by the method of uniform and variable	
			offorts 6 Evaluation with specific	
			evidence the level of development of	
			resistance and the degree of mastery of a	
			resistance and the degree of mastery of a	
			sports game	
	1-st Voor	1	sports game.	1
	1-st Year	1	sports game. Physics Course content:	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Station	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and closetic worker.	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physical mechanics of molecular	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of guartum machanics etamin	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and publics physics	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and nuclear physics.	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and nuclear physics. Content of seminar or practical works: Description	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and nuclear physics. Content of seminar or practical works: Processing of experimental data. Electrical	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and nuclear physics. Content of seminar or practical works: Processing of experimental data. Electrical and magnetic methods. Methods for	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and nuclear physics. Content of seminar or practical works: Processing of experimental data. Electrical and magnetic methods. Methods for determination of the propagation velocity of	1
	1-st Year	1	sports game. Physics Course content: Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and nuclear physics. Content of seminar or practical works: Processing of experimental data. Electrical and magnetic methods. Methods for determination of the propagation velocity of waves. Methods of temperature	1
	1-st Year	1	<ul> <li>sports game.</li> <li>Physics</li> <li>Course content:</li> <li>Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements. Elements of quantum mechanics, atomic and nuclear physics.</li> <li>Content of seminar or practical works:</li> <li>Processing of experimental data. Electrical and magnetic methods. Methods for determination of the propagation velocity of waves. Methods of temperature determination. Determination of liquid</li> </ul>	1
	1-st Year	1	<ul> <li>sports game.</li> <li>Physics</li> <li>Course content:</li> <li>Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements.</li> <li>Elements of quantum mechanics, atomic and nuclear physics.</li> <li>Content of seminar or practical works:</li> <li>Processing of experimental data. Electrical and magnetic methods. Methods for determination of the propagation velocity of waves. Methods of temperature determination. Determination of liquid viscosity. Determination of density and</li> </ul>	1
	1-st Year	1	<ul> <li>sports game.</li> <li>Physics</li> <li>Course content:</li> <li>Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements.</li> <li>Elements of quantum mechanics, atomic and nuclear physics.</li> <li>Content of seminar or practical works:</li> <li>Processing of experimental data. Electrical and magnetic methods. Methods for determination of the propagation velocity of waves. Methods of temperature determination. Determination of liquid viscosity. Determination of density and superficial tension. Experiments in atomic</li> </ul>	1
	1-st Year	1	<ul> <li>sports game.</li> <li>Physics</li> <li>Course content:</li> <li>Elements of physical mechanics Statics and dynamics of fluids. Oscillations and elastic waves. Elements of molecular physics. Thermodynamic elements.</li> <li>Elements of quantum mechanics, atomic and nuclear physics.</li> <li>Content of seminar or practical works:</li> <li>Processing of experimental data. Electrical and magnetic methods. Methods for determination of the propagation velocity of waves. Methods of temperature determination. Determination of liquid viscosity. Determination of density and superficial tension. Experiments in atomic physics. Problems related to the chapters</li> </ul>	1

		1-st Year	1	Descriptive Geometry	5
				Course content:	
				Chapter 1. Projection systems: Conical	
				projection, cylindrical projection, quoted	
				projection. Chapter 2. Representation of	
				the point the straight and the plane. The	
				representation of the point in space and in	
				the purge in the double and triple	
				orthogonal projection Representation of	
				the straight into space and purge simple	
				straight and double particular relative	
				positions of the two straight. The	
				representation of the plane in apage and in	
				the pure the right and the point contained	
				in the plane, the particular straight lines	
				in the plane, the particular straight lines	
				contained in the plan, the simple and	
				double particular plane, the relative	
				position of the two planes, the relative	
				positions of a straight to a plane, the	
				straight and the plane perpendicular,	
				purge. Head. 3. Polyhedra: Definition,	
				classification, representation of polyhedra.	
				Polyline flat sections. Intersection of	
				polyhedra with right. Deploying polyhedra.	
				Head. 4. Cylinder and cone: Definition,	
				classification, representation of cylindrical-	
				conical bodies. Flat sections with cylindrical	
				conical bodies. Intersection of cylindrical-	
				conical with right. Deploying the cylinder	
				and cone. Head. 5. Sphere: Sphere	
				representation, points on the sphere, plane	
				tangent to the sphere, plane spheres	
				through the sphere, intersection of a	
				straight with a sphere, unfolded to the	
				sphere Head 6 Intersections of	
				geometrical bodies Polybedral	
				intersections intersections of cylindrical-	
				conical bodies cone and cone	
1		1	1	conical boules, cone and cone	1

intersections with co	ne and cylinder	
The content of the	seminar or practical	
works:	-	
1.Applications to the	e representation of the	
point, the right a	and the plane: The	
representation of the	e point in space and in	
the purge, in the d	ouble and in the triple	
orthogonal projectiv	on: representation of	
straight and double	private straight lines.	
determination of t	races and crossings	
crossed by the right	intersections of planes	
and plates visibili	ity in the purge 2	
Applications in the F	Polyhedra chanter: The	
intersection of some	particular planes with	
nucleotion of some	straight intersections	
with prism and pyram	, straight intersections	
doplovmonte 2 Apr	lications in the chapter	
evlinder and cone:	The intersection of any	
cylinder and cone.	The intersection of any	
planes and particula	the interpretions of	
and the cylinder,	the intersections of	
straight with the cyli	nder and the cone, the	
rollers of the cylind	der and the cone. 4.	
Sphere applications	s: Sphere intersection	
with particular plane	e and planar plane, the	
intersection of the	straight line with the	
sphere, unfolded	to the sphere. 5.	
Applications in	the intersection of	
geometric bodies	: Intersections of	
polyhedres, interse	ections of cylindrical-	
conical bodies, inter	sections of sphere with	
cone and prism.		
1-st Year 1 English		5
Course content:		
Communication, p	rinciples, units and	
characteristics of	communication; the	
effects of communit	cation, the intelligibility	
of the message:	levels of human	

1-st Year       1       Materials Contents, 1 monophase of the structure, control of the structure, contren of the structure, conthestor of the structu		1			1
1-st Year       1       Materials Science and Engineering Course contentials. The link between chemical composition. Transformations of solid       2/5				communication: clear, complete, concise,	
1-st Year       1       Materials Science and Engineering Course contents: Networks: Computing studies for making or spaces and scientific papers, projects.       2/5         1-st Year       1       Materials Science and Engineering Course contents: Networks: Diagram of phase equilibrium, presentations. The sum of solid       2/5				concrete, fair, receptive, courteous	
1-st Year       1       Communication networks. Communication in conflict management. Communication and listening. Presentations. Formats for presentations. Formats for presentations. Formats for presentations. Structure of technical-scientific works: papers, studies completion, papers and scientific papers, projects. Human-to-human interaction mediated by web and audio-video technologies.         The content of the seminar or practical works:       Technical and business correspondence. Design and drafting CV (European format). Letter of intent. Interview selection, employment, promotion on the job. Oral and written presentations. Technical and scientific papers, projects.         1-st Year       1       Materials Science and Engineering Course composition-processing conditions-property structure. Atomic architecture, crystalline imperfections. The amorphous structure, Reveal to metails. Alloy systems. Diagram of phase equilibrium. Fe-C alloy systems. Diagram of phase equilibrium.				message. Nonverbal communication.	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition. Types dimension of solid       2/5         1-st Year       1       Materials Science and Engineering Conditions-processing conditions-property structure. Atomic architecture. Crystalline structure. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				Communication networks. Communication	
1-st Year       1       Materials Science and Engineering Course contents: The amongous of the presentation. The amongous of the presentation.       2/5         1-st Year       1       Materials Science and Engineering Courses in the structure. Crystalline imperfaction. The amongous of the system. The amongous of the presentation.       2/5				in conflict management. Communication	
1-st Year       1       Materials Science and Engineering Completion. The amorphous structure. Crystalline imperfections. The amorphous structure. Crystalline imperfections. The amorphous structure. Diffusion laws. Solid/fication of mestale duy system. Transformations of solid				and listening. Presentation of techniques	
1-st Year       1       Materials Science and Engineering Completion, papers and scientific papers, projects.       2/5         1-st Year       1       Materials Science and Engineering Completion, papers and scientific papers, projects.       2/5         1-st Year       1       Materials Science and Engineering Completion, papers and scientific papers, projects.       2/5         1-st Year       1       Materials Science and Engineering Constition, papers and scientific papers, projects.       2/5				for making oral and written scientific	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				presentations Formats for presentations	
Image: Structure of technical-scientific works: papers, studies completion, papers and scientific papers, projects. Human-to-human interaction mediated by web and audio-video technologies.       The content of the seminar or practical works:         The content of the seminar or practical works:       The content of the seminar or practical works:         Technical and business correspondence.       Design and drafting CV (European format).         Letter of intent. Interview selection, employment, promotion on the job. Oral and written presentations. Technical and scientific works: papers, studies completion, papers and scientific papers, projects.         1-st Year       1         Materials Science and Engineering conditions-property structure. Atomic architecture. Crystalline structure, atomic architecture. Crystalline structure, atomic architecture. Crystalline structure, atomic architecture. Crystalline structure, atomic architecture. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy system. Transformations of solid				Organization of the presentation Data	
1-st Year       1       Materials Science and Engineering Course contents: Networks: papers, studies completion, papers and scientific papers, projects. Human-to-human interaction mediated by web and audio-video technologies.         The content of the seminar or practical works:       Technical and business correspondence. Design and drafting CV (European format). Letter of intent. Interview selection, employment, promotion on the job. Oral and written presentations. Technical and scientific works: papers, studies completion, papers and scientific papers, projects.         1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium.       2/5				integration Media elements Structure of	
1-st Year       1       Materials Science and Engineering Completion, papers and scientific papers, projects. Human-to-human interaction mediated by web and audio-video tecchnologies. The content of the seminar or practical works: Technical and business correspondence. Design and drafting CV (European format). Letter of intent. Interview selection, employment, promotion on the job. Oral and written presentations. Technical and scientific works: papers, studies completion, papers and scientific papers, projects.       2/5         1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				technical-scientific works: papers studies	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Diffusion. Diffusion laws. Solidification of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				completion papers and scientific papers	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure, Atomic architecture. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				projects Human-to-human interaction	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure, Atomic architecture. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				mediated by web and audio-video	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Diffusion. Diffusion laws. Solidification of metallic materials. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. The solid solidification of metallic materials. The solid structure. Diffusion laws. Solidification of metallic materials. Alloy       2/5				technologies	
1-st Year       1       Metrials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline imperfections. The amorphous structure, crystalline imperfections. The amorphous structure, Diffusion laws. Solidification of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				The content of the seminar or practical	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				works:	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion laws. Solidification of materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				Technical and business correspondence	
1-st Year       1       Design and drating CV (Eulopean formal). Letter of intent. Interview selection, employment, promotion on the job. Oral and written presentations. Technical and scientific works: papers, studies completion, papers and scientific papers, projects.       2/5         1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Ibifusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				Design and drafting CV (European format)	
1-st Year       1       Materials Science and Engineering Course contents:       2/5         1-st Year       1       Materials Science and Engineering Course contents:       2/5         Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				Letter of intent Intension coloritor	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				Letter of intent. Interview selection,	
1-st Year       1       Materials Science and Engineering Course contents:       2/5         Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				employment, promotion on the job. Oral	
Scientific       Works:       papers,       studies         completion, papers and scientific papers,       projects.       projects.       2/5         1-st Year       1       Materials Science and Engineering       2/5         Course contents:       Introduction. Types of materials. The link       between chemical composition-processing       2/5         conditions-property       structure.       Atomic       architecture.       Crystalline       structure,       atomic         structure.       Diffusion.       Diffusion.       Diffusion       laws.       Solidification of metallic materials. Alloy         systems.       Diagram of phase equilibrium.       Fe-C alloy system. Transformations of solid       Fe-C alloy system.       Solidification of solid				and written presentations. Lechnical and	
1-st Year       1       Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid       2/5				scientific works: papers, studies	
1-st Year       1       Materials Science and Engineering Course contents:       2/5         Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				completion, papers and scientific papers,	
1-st Year1Materials Science and Engineering Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid2/5				projects.	
Course contents: Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid		1-st Year	1	Materials Science and Engineering	2/5
Introduction. Types of materials. The link between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				Course contents:	
between chemical composition-processing conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				Introduction. Types of materials. The link	
conditions-property structure. Atomic architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				between chemical composition-processing	
architecture. Crystalline structure, crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				conditions-property structure. Atomic	
crystalline imperfections. The amorphous structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				architecture. Crystalline structure,	
structure. Diffusion. Diffusion laws. Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				crystalline imperfections. The amorphous	
Solidification of metallic materials. Alloy systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				structure. Diffusion. Diffusion laws.	
systems. Diagram of phase equilibrium. Fe-C alloy system. Transformations of solid				Solidification of metallic materials. Alloy	
Fe-C alloy system. Transformations of solid				systems. Diagram of phase equilibrium.	
				Fe-C alloy system. Transformations of solid	
state phases. Thermal treatments: Non-				state phases. Thermal treatments: Non-	
ferrous alloys. Aluminum and copper;				ferrous alloys. Aluminum and copper;	

1-st Year       2       Ceramic materials. Plastic materials. Composite materials         1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents. Solving systems of linear equations. Head, II. Vector systems of antix, Solving systems of antight antispastericontex Solving systems of antispastericontex Sol					1
1-st Year       2       Composite materials The content of the seminar or practical works: Metalographic Microscope. Research on the structure of materials, by optical microscopy. Sample preparation for exaggeration. to the optical microscope. Macroscopic analysis of metallic materials; Determination of non-metallic inclusions in steels. Quantitative structural determinations. Structural constituents in metallic materials; The Fe-Fe3C system. Carbon and white steel steels. Fe-graphite system. Gray fonts; Structure of plastic deformed steels. Structure of plastic deformed steels. Structure of thermally treated steels. Structure of thermally treated steels. Structure of non-ferrous alloys. Plastics, structure and properties. Structure of ceramic and composite materials.       5         1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head, I. Vector spaces. Space and vector subspace. Linear variety. Addiction and size       5				Ceramic materials. Plastic materials.	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course of Imaterials.       5         1st Year       2       Linear Algebra, Analytic Geometry and Systems of Imaterials.       5				Composite materials	
1-st Year       2       Linear Algebra, Analytic Geometry and Differentials.       5         1-st Year       2       Linear Algebra, Analytic Geometry and Differentials.       5				The content of the seminar or practical	
1-st Year       2       Linear Algebra, Analytic Geometry and properties. Structure of nativi, inverse of a matrix, solving systems of linear equations. Systems of linear equations. Systems of linear equations. Structure of plastic determinant of nor-ferrous and white steels. Structure of thermally treated steels. Structure of thermally treated steels. Structure of thermally treated steels. Structure of an attriation of nor-ferrous and white steels. Structure of an attriation of nor-ferrous and properties. Structure				works:	
1-st Year       2       Linear Algebra, Analytic Geometry and properties. Structure of ceramic and composite materials.       5         0       Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear inference Rase and size				Metalographic Microscope. Research on	
1-st Year       2       Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, investor spaces. Space and vector subspace. Linear variety. Addiction and linear independence Bases and size       5				the structure of materials, by optical	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents: Carbon Analytic gestermination of a matrix, inverse of a matrix, Solving systems of linear equations. Head, II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear indendence materials.				microscopy Sample preparation for	
Macroscopic analysis of metallic materials;         Determination of non-metallic inclusions in steels.         Quantitative structural determinations. Structural constituents in metallic materials;         The test of the test. Structure of the test of the test of the test of the test. Structure of the test of the test of the test of the test. Structure of the test of the test of the test. Structure of the test of the test of the test. Structure of the test of the test. Structure of the test of the test. Structure of the test of test of the test. Structure of the of test of test of test of test of test of test. Structure of test of test of test of test of test of test. Structure of test of test of test of test of test of test of test. Structure of test of				exaggeration to the optical microscope	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Courses of matrix. Solving system sof linear equations. Assembling and multiplying two matrices, calculating the determinants. Systems of linear equations. Head, II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence materials.       5				Macroscopic analysis of metallic materials:	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents: Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, Solving systems of a matrix, Solving and multiplying two matrices, calculating the determinant of a matrix, Addiction and linear equations. Head, II. Vector spaces. Space and vector subspace. Linear variety, Addiction and linear equations.				Determination of non-metallic inclusions in	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents: Carbon ard white steels. Structure of thermally treated steels. Structure of Allied Steels. Structure of Allied Steels. Structure of an artix, inverse of a matrix. Solving systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head, II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence Base and size				steels Quantitative structural	
1-st Year       2       Linear Algebra, Analytic Geometry and properties. Structure of non-ferrous alloys. Plastics, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and binear independence Base and size				determinations Structural constituents in	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence materials.				motallia materiale: The Ee Eo2C system	
1-st Year       2       Calour and winte steels. Pre-graphite system. Gray fonts; Structure of plastic deformed steels. Structure of thermo- chemically treated steels. Structure and properties of welded joints. Structure of Allied Steels. Structure of non-ferrous alloys. Plastics, structure and properties. Structure of ceramic and composite materials.         1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence Base and size				Corbon and white steel steels. Fo graphite	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         Solving systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix. Solving systems of linear equations. Head.       1. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence Base and size				Carbon and while steel steels. Fe-graphile	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents: Cap. I. Matrices, calculating the determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence materials       5				deformed steels. Structure of thermally	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence Base and size				deformed steels. Structure of thermally	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				treated steels. Structure of thermo-	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				chemically treated steels. Structure and	
Allied Steels. Structure of non-terrous alloys. Plastics, structure and properties. Structure of ceramic and composite materials.         1-st Year       2         1-st Year       2         Linear Algebra, Analytic Geometry and Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence Base and size				properties of weided joints. Structure of	
alloys. Plastics, structure and properties. Structure of ceramic and composite materials.         1-st Year       2         Linear Algebra, Analytic Geometry and Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				Allied Steels. Structure of non-ferrous	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				alloys. Plastics, structure and properties.	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head.       1. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				Structure of ceramic and composite	
1-st Year       2       Linear Algebra, Analytic Geometry and Differential Course contents:       5         Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				materials.	
Differential Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size		1-st Year	2	Linear Algebra, Analytic Geometry and	5
Course contents: Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				Differential	
Cap. I. Matrices, determinants. Systems of linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				Course contents:	
linear equations. Assembling and multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				Cap. I. Matrices, determinants. Systems of	
multiplying two matrices, calculating the determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				linear equations. Assembling and	
determinant of a matrix, inverse of a matrix. Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				multiplying two matrices, calculating the	
Solving systems of linear equations. Head. II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				determinant of a matrix, inverse of a matrix.	
II. Vector spaces. Space and vector subspace. Linear variety. Addiction and linear independence. Base and size				Solving systems of linear equations. Head.	
subspace. Linear variety. Addiction and				II. Vector spaces. Space and vector	
linear independence Base and size				subspace. Linear variety. Addiction and	
				linear independence. Base and size.	
Changing the coordinates of a vector when				Changing the coordinates of a vector when	
changing the base. Head. III. Linear				changing the base. Head. III. Linear	
Applications. Definition of a linear				Applications. Definition of a linear	
application, examples, properties, image				application, examples, properties, image	

		and kernel, associated matrix.	
		Isomorphism of vector spaces. Own	
		vectors and own values. Diagonalization of	
		a matrix. Head. IV. Functional linear.	
		bilinear, square. Definition, matrix attached.	
		canonical expression of a square	
		functional. Head. V. Euclidean vector	
		spaces. Scalar product. norm. angle.	
		projections. Ortonormate bases.	
		Orthorhombic procedures, Head, VI, Free	
		vectors. The notion of free vector and	
		bound vector. Vector space of free vectors	
		Scalar product, vector product, mixed	
		product, double vector vector of free	
		vectors. Head. ARE YOU COMING. Plan	
		and right in E3. Cartesian landmark,	
		coordinate systems in space and plan.	
		Changing the landmark. Equations of the	
		plan. Distance from one point to a plane.	
		Relative positions of two planes, planar	
		beam. Types of equations of a straight line	
		in E3. Relative positions of two straight	
		lines; competition and common	
		perpendicular; point of intersection. The	
		distance between two straight lines.	
		Relative positions of the plane and the	
		straight. Orthogonal projections. The	
		symmetry of a point towards a plan,	
		respectively face o right. Head. VIII.	
		Cuadra. Sphere: sphere definition, sphere	
		determination by given conditions.	
		Intersection of the sphere with a plane.	
		Intersection of the sphere with a right.	
		Tangent, plane tangent to a sphere.	
		Cuadrices on reduced equations: ellipsoid,	
		hyperboloid, paraboloid, cylinder, con.	
		Head. IX Elements of Differential Curve	
		Theory. Analytical representation of plane	

				curves and space. Parameterization by arc	
				length. Calculate the length of a curve arc.	
				Frenet's formulas, curvature and torsion of	
				a curve Frenet's class Geometric	
				interpretation of curvature and torsion	
				Con X Elemente of ourfood differential	
				Cap.A. Elements of surface differential	
				theory. Analytical representation of	
				surfaces; plane tangent and normal to a	
				surface; calculating arc lengths of the curve	
				and angles between two curves located on	
				a surface. The first and second	
				fundamental form of a surface; surface	
				orientation. Cylindrical conical surfaces.	
				Rotating surfaces.	
				The content of the seminar or practical	
				papers:	
				Applications to the coursework topics	
				(students will learn to use the lessons	
				studied at the source to solve problems	
				studied at the course to solve problems	
		4	•	related to course topics.)	
		1-st Year	2	Drawings and Infographics I	4
				Course content:	
				C1- Rules for drawing STAS 6134-84; C2 -	
				Inscription of the precision elements of the	
				execution; dimensional tolerances STAS	
				ISO406-91, adjustments; geometric	
				tolerances SR EN ISO 7083-2002; STAS	
				7385 / 1.2-1985: STAS 7391 / 1.2.3.4.5-	
				76: C3 - Representation and quotation of	
				STAS 5013 / 1 2 3 4-82 toothed wheels	
				C/- Representation of gears SP EN ISO	
				2203-2002: C5- Demountable accompliance	
				threaded accompliant factor accompliant	
				Clat assembling OD EN 100 0440 4007	
				SIDE ASSEMBLIES SK EN ISO 6413-1997;	
	1	1		Labelic titlings SR EN IS() $2162 / 1.2 - 1007$	1
				C6 - tree representation; drawing the	
				C6 - tree representation; drawing the execution drawing for a tree; C7 -	

		rolling bearings STAS 8953-85; SR EN ISO	
		8826 / 1.2-2002; C8- Representation of	
		elements and sealing devices SR ISO	
		9222 / 1,2-1994; C9-C10-Representation of	
		non-demountable assemblies: welded	
		assemblies SR EN 22553-1995 and	
		riveting assemblies; C11- Rules for the	
		drawing of metal constructions STAS	
		11634-83; C12- Drawing rules for civil	
		construction SR EN ISO7518-2002; C13 -	
		Drawings of installation drawings; Symbols	
		SR EN ISO 6412 / 1,2,3-2002; C14-	
		Representation of kinematic schemes;	
		symbology.	
		Content of seminar or practical works:	
		L1 - 4 hours Representation of flanges and	
		threads. Threaded threads and threads SR	
		ISO6410 / 1,2,3-1995. (Teaching +	
		planing) - / LP1L2 - 4 hours - Drawings of	
		some parts by means of revealing (cap,	
		gear pump body); tolerances and	
		roughness SR RN ISO 1302-2002 / LP2 /	
		1,2, L3 - 4ore - finishing LP2 L4 -4 hours-	
		Execution drawings for sprockets in a	
		toothed wheel assembly (cylindrical gear	
		pump) representation of centering holes	
		SR EN ISO 6411: 2001. Applications to	
		STAS 5013 / 1,2, -82, SR EN ISO 2203-	
		2002. LP3 / 1.2 L5, 6 - 8 hours Gear	
		shapes: cylindrical, conical, worm	
		gears.LP4 / 1,2,3; L7-4 hours Compact	
		gear pump design; LP5; L8-4 hours Overall	
		design for a conical gearbox; the design	
		drawing of a conical wheel STAS 5013 / 3-	
		82 and the marking of heat treatment stas	
		7650-89. LP6 / 1.2; L9-4 hours Readings:	
		Overall drawing for a cylindrical, worm gear	
		reducer; Extraction of details and	

			representation of: assembled assemblies -	
			threaded assemblies, feathers STAS 1004-	
			81, 1007-81, 1012-77, grooves and elastic,	
			SR EN ISO 6413-1997; SR EN ISO 2162 /	
			1,2-1997 - LP7;	
	1-st Year	2	Sports	5
			The content of the seminar or practical	
			works:	
			1. Presentation of minimal theoretical	
			content regarding the activity of physical	
			education, training for labor protection,	
			presentation of the objectives and	
			requirements of the discipline, support of	
			the initial tests. 2. Repeat the main	
			methods of football - girls and vollevball	
			girls, known from previous cycles,	
			Positioning in attack and defense systems.	
			Bilateral games Developing the rectifying	
			rate to auditory and visual stimuli Repeat	
			kick start and launch from start	
			development of the speed of movement	
			through accelerators on variable distances	
			20-60m Educating dynamic strength in	
			upper lower limbs abdomen and trunk by	
			working in the sircuit and by working on	
			workshops 2 Evaluation with specific	
			sources the level of movement specific	
			development and cogmontal muscle	
			strength 4 Presentation of the topic	
			approached in competer 2 Readiness to	
			approached in semester 2. Readiness to	
			main elements and technical procedures	
			chain elements and technical procedures	
			advorsity in a bilatoral game Developing	
			the elemente of ecordinating econosity	
			the elements of coordinating capacity -	
			halanaa anatia tamparal ariantatian	
			balance, spatio-temporal orientation,	
			combination of movements, kinestnetic	

			discrimination, ambidextructure, agility. Education of aerobic and mixed resistance by the method of uniform and variable efforts. 6. Evaluation with specific evidence, the level of development of resistance and the degree of mastery of a sports game.	
	1-st Year	2	<b>Electrotechnics</b> <b>Course content:</b> 1. General Electrotechnics: DC Electric Circuits: Printed Electrical Fields. Electricity. The Law of Electric Driving. Law of energy transformation into conductors. Kirchhoff's theorems. Resolving DC circuits. The balance of powers. Maximum power transfer. Theorem of power conservation in DC. Electromagnetism: The magnetic field. Magnetic induction. Magnetic Field Intensity. The magnetic flux. Magnetisation of bodies. The hysteresis phenomenon. The fundamental law of the magnetic circuit. The phenomenon of electromagnetic induction. Autoinducer. Mutual induction. Eddy currents (Foucault). The magnetic field energy. Electromagnets. Single-phase alternating current generation. Characteristic dimensions of the single-phase alternating current. Symbolic representation of sinusoidal sizes. Laws and theorems in c.a. AC Circuit Elements. Series circuits and alternating current. Power in c.a. phase. Improving the power factor. Resonance in electrical circuits. Three-phase electric circuits: Polyphase systems. Three-phase systems. Star connection. Triangle connection. Electrical powers in three-	1

		phase circuits. Connecting the receivers in	
		three-phase electrical networks. Connect in	
		star. connecting in the triangle. Electrical	
		Measurement: Classification of Electrical	
		Measurement Devices. General notions of	
		metrology. Constructive Principles of	
		Measuring Devices. Analogue measuring	
		instruments. Measurement of current	
		intensity. Measurement of voltages.	
		Resistance measurement. Measurement of	
		active and reactive DC and single-phase	
		and three-phase powers. Measurement of	
		active and reactive DC and single-phase	
		and three-phase energies. Measurement of	
		impedances (inductances and capacities).	
		Measurement of power factor. Frequency	
		measurement. 2. Electric Machines:	
		Electric Transformers: Single-Phase	
		Transformer. Constructive elements.	
		Principle of operation. Operation of the	
		single-phase transformer. Functioning in	
		pregnancy. Single-phase transformer yield.	
		Three-phase transformers.	
		Autotransformer. Welding transformers.	
		Transformers for electric arc furnaces.	
		Asynchronous machines: Construction	
		elements of the three-phase asynchronous	
		machine. Motor operation of the	
		asynchronous machine. Electromagnetic	
		torque of the asynchronous machine.	
		Characteristics of three-phase	
		asynchronous motor. Starting the three-	
		phase asynchronous motor. Adjusting the	
		speed and reversing the rotation direction.	
		Single-phase asynchronous motor.	
		Synchronous machine: Construction	
		principles of the three-phase synchronous	
		machine. Operation of the synchronous	

			machine as a generator. Characteristics of	
			the symphony and senerator. Develop	
			the synchronous generator. Paraller	
			operation of synchronous generators.	
			Synchronous engine operation and	
			characteristics. Starting the three-phase	
			synchronous motor. DC machine:	
			Construction of the c.c. Operation of the	
			c.c. in generator mode. Characteristics of	
			the c.c. with independent excitement and	
			derivation Characteristics of the c.c. with	
			derivation. Characteristics of the	
			senal excitement. Characteristics of the	
			c.c. with mixed excitement. Operation of	
			the c.c. in engine mode. Speed and torque	
			of the engine torque. Engine features of	
			c.c. with separate excitation and derivation.	
			Engine features of c.c. with serial	
			excitement. Engine features of c.c. with	
			mixed excitement. The losses and the	
			efficiency of the c c	
			Content of the seminar or practical	
			content of the seminal of practical	
			Papers.	
			Strength and power in DC.	
			2. Own inductivities, mutualities and	
			capabilities. 3. Series circuits and current	
			derivation Alternative. 4. Power in AC	
			circuits. Improving power factor. 5. Single-	
			phase transformer. Trace the transformer	
			characteristics. 6. Asynchronous engine	
			study. 7. Diesel engine study	
	1-st Year	2	English	5
			The content of the seminar or practical	
			works:	
			Semester I - Production Specialized	
			vocabulary and discourse situations	
			Grammar in focus: Present tanses (present	
			simple present continuous present	
			simple, present continuous, present	
			perfect, Research and Development,	
			Specialized vocabulary and discourse	

			situations.) Grammar in focus: Past tenses (past simple, past continuous, past perfect). Grammar in focus: Future forms, Logistics, Specialized vocabulary and discourse situations, Grammar in focus:	
			vocabulary and discourse situations, Grammar in focus: Verb phrases. Focus: Verb phrases - Assessment test - Semester II - Engineering - Specialized vocabulary and discourse situations - Grammar in focus: Active versus Passive - Relative clauses - Automotive - Specialized	
			vocabulary and discourse situations. discourse situations. Grammar in focus: Obligation and requirements vocabulary and discourse situations. Grammar in focus: Cause and effect. Construction. Specialized vocabulary and discourse situations. Grammar in focus: Ability and inability. Assessment test.	
	1-st Year	2	Mechanics I Course content: Recapitulative notions about vector operations, principles and the axioms of mechanics. Moments theory: Moment of force in relation to a point and an axis; Central Axis Reduction Cases; Reducing particular systems of forces; Center of Parallel Forces. Static moments and centers of gravity, Guldin's theorems. Equilibrium of rigid subject to ideal bonds, types of bonds. Methods and theorems in statics of material systems: Element isolation method; Method of solidification; Method of isolating parts. Beam beams. Rubbing in the technique: Rubbing; Rolling friction; Pivoting rubbing; Rubbing in joints	2/5

			and bearings. Static of yarns: General equation of yarns; Wire rubbing. Applications in static technique: Parga and inclined plane; Scrapers and pulley systems; Even the screw; Brake band brake and sabot brake. Point Cinematic: Coordinate Systems; Speed and acceleration; Particular moves of the point. <b>The content of the seminar or practical works:</b> S1 - Introduction - vector operations. Applications. S2 - Moment of force relative to a point and an axis. Applications. S3 - Reduction of force systems, center axis, reduction cases. Applications. S4 - Table Centers. Applications. S5 - Equilibrium of the rigid subject to ideal bonds. Applications. S6 - Statics of material systems. Applications. S7 - Friction systems. Applications.	
	1-st Year	2	ComputersProgrammingandProgramming LanguagesObjectives:Understanding the basic concepts of structure programming and building the skills needed to design advanced applications. Knowing the facilities of a modern programming environment. • Developing and testing some C language applications.Course ContentRepresentation of information in numerical computers, numbering systems, alphanumeric codes, numeric codes. Algorithms and logic schemes, pseudocode language. Fundamental algorithms. Language C, introduction.	5

			Instructions. Types Input / Output	
			Functions. Operators and phrases.	
			Panels.	
			Application Content	
			Numerical systems: binary, octal,	
			hexadecimal. Convert numbers from	
			one counting system to another.	
			Numeric codes. Representation of	
			numbers in complement to 2. Sorting	
			and intercalating algorithms. Fast	
			search algorithms. Application for	
			displaying integer values with words.	
			Application for graphic representation	
			of trigonometric functions over a certain	
			range. Representing surfaces in space.	
			Application for adding and subtracting	
			numbers as large as possible. Show	
			contents of whole variables in binary	
			format. Duplicate elimination	
			application in a text. Define some	
			exceptions. Remove a specific word	
			from a text. Sorting and fast search	
			applications.	
	1-st Year	2	Materials Technology	4
			Course contents:	
			Structure of materials. Crystalline	
			structures. Types of metal-specific	
			crystalline structures. Crystal imperfections	
			Deformation in metallic	
			crystals.Deformation of polycrystalline	
			aggregates. Amorphous structures.	
			Nechanical properties of materials.	
			conventional voltage R with specific	
			deformation e Voltage variation s with	
			deformation degree e. Rational curve.	
I		1		1

		Elongation at break. Tackle at break.
		Hardness. Determination of Brinell
		hardness. Determination of hardness by
		Vickers method. Rockwell Hardness
		Determination. Resilience. Influence of
		temperature on material properties. Fluid
		properties. Visco-elastic behavior of
		polymers. Physical Properties of Materials.
		Density. Thermal expansion. Melting
		properties. Specific heat and thermal
		conductivity. Diffusion. Resistivity and
		conductivity. Electrochemical processes.
		Processing of metallic materials. Obtaining
		metallic nanostructures through Several
		Deformation Processing. Processing
		sheets and bands. Welding of metallic
		materials. Overview of welding technology.
		Physics of welding. Structure of welded
		joints. Solderability of metallic materials.
		Arc welding. Arc welding arc. The arc
		welding technology. Welding under flow
		layer. Welding in the protective gas
		environment. Welding in a slag bath.
		Aluminotermic welding. Welding by
		pressing and heating by contact electrical
		resistance. Plasma welding. Coating and
		deposition processes. Electrodeposition.
		Physical and chemical deposits. Organic
		coatings. Ceramic coatings. Coatings by
		thermal and mechanical processes.
		Bottling of bottles. Raw materials used in
		the manufacture of bottles. The process of
		manufacturing glass. Processing of
		ceramic materials and ceramics.
		Processing of plastics. Rubber processing.
		Processed Integrated Circuits. Silicon
		processing. Lithography. Thermal
		oxidation. Chemical deposition in the vapor

				state. Integrated circuits encapsulation.	
				Content of the seminar or practical	
				works:	
				Presentation of the laboratory, SSM and	
				specific SU; The hardness attempt.	
				Traction test. Bending on shock. The	
				properties of the formation mixtures	
				Formation in two frames with classic	
				mixture and gravitational casting Forging	
				forging operations forging in molds	
				molding of liquid metal Polling lamination	
				rolling friction coefficient veriction of	
				Ioming inclion coefficients with deformation	
				dagraa Extrucion	
				Dragonaina hu covere plactic defermention	
				Processing by severe plastic deformation	
				in order to obtain materials with ultratine	
				structure. Welding with manual and	
				automatic arc under flow layer. Welding by	
				pressure and heating by its own strength.	
				Welding with oxyacetylene flame. Flame	
				cutting.	
		2-nd Year	1	Drawings and Infographics II	3
				Course content:	
				AutoCAD - Overview. Basics for Drawing.	
				Enter text into graphic files. Orders for	
				multiplying objects. Tentative notions.	
				Polylines. Editing commands Advanced	
				Drawing commands. 3D drawing	
				commands: nonprimitive. 3D drawing	
				commands: primitive. 3D editing	
				commands Preparation of product	
				technical documentation	
				The content of the seminar or practical	
				works	
				Lising basic drawing commande in	
				AutoCAD and aditing completed drawings	
				Autocab and editing completed drawings.	
				AutoCAD Llos adversed drawing	
	1			AUTOCAD. Use advanced drawing	1

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				commands in AutoCAD. 3D modeling:	
				drawing, editing. Preparation of product	
				technical documentation.	
		2-nd Year	1	Sports	3
				The content of the seminar or practical	
				works:	
				1. Presentation of minimal theoretical	
				content regarding the activity of physical	
				education, training for labor protection,	
				presentation of the objectives and	
				requirements of the discipline, support of	
				the initial tests. 2. Repeat the main	
				methods of football - girls and volleyball	
				girls, known from previous cycles.	
				Positioning in attack and defense systems.	
				Bilateral games. Developing the rectifying	
				rate to auditory and visual stimuli. Repeat	
				kick start and launch from start,	
				development of the speed of movement	
				through accelerators on variable distances	
				20-60m. Educating dynamic strength in	
				upper, lower limbs, abdomen and trunk by	
				working in the circuit and by working on	
				workshops. 3. Evaluation with specific	
				scores, the level of movement speed	
				development and segmental muscle	
				strength. 4. Presentation of the topic	
				approached in semester 2. Readiness to	
				effort. Sports Games. 5. Strengthen the	
				main elements and technical procedures	
				specific to sports games. Their repetition in	
				adversity, in a bilateral game. Developing	
				the elements of coordinating capacity -	
				rhythm, precision, static and dynamic	
				balance, spatio-temporal orientation,	
				combination of movements, kinesthetic	
				discrimination, ambidextructure, agility.	
				Education of aerobic and mixed resistance	

			by the method of uniform and variable	
			efforts. 6. Evaluation with specific	
			evidence, the level of development of	
			resistance and the degree of mastery of a	
			sports game.	
	2-nd Year	1	English	2
			The content of the seminar or practical	
			works:	
			Semester I - Production. Specialized	
			vocabulary and discourse situations.	
			Grammar in focus: Present tenses (present	
			simple, present continuous, present	
			perfect, Research and Development,	
			Specialized vocabulary and discourse	
			situations.) Grammar in focus: Past tenses	
			(past simple, past continuous, past	
			perfect). Grammar in focus: Future forms,	
			Logistics, Specialized vocabulary and	
			discourse situations, Grammar in focus:	
			Conditionals, Quality, Specialized	
			vocabulary and discourse situations,	
			Grammar in focus: Verb phrases. Focus:	
			Verb phrases - Assessment test -	
			Semester II - Engineering - Specialized	
			vocabulary and discourse situations -	
			Grammar in focus: Active versus Passive -	
			Relative clauses - Automotive - Specialized	
			vocabulary and discourse situations.	
			discourse situations. Grammar in focus:	
			Obligation and requirements vocabulary	
			and discourse situations. Grammar in	
			focus: Cause and effect. Construction.	
			Specialized vocabulary and discourse	
			situations. Grammar in focus: Ability and	
			inability. Assessment test.	
	2-nd Year	1	Machine-Tools and Cutting Processing	3
			Course content:	
			Elementary notions about surface	

		generation on machine tools. General	
		considerations. The kinematics of	
		generation. Generating curve: definition,	
		materialized generators, kinematic	
		generators resulting as a trajectory of a	
		point or as a winding of a curved family,	
		programmed generators. Directional curve:	
		definition, materialized directories and	
		kinematic directories. Basic notions of the	
		theory of cutting and cutting tools.	
		Construction of cutting tools. Geometry of	
		cutting tools. Sharpening. Cutting forces.	
		Heat sources and heat balance of the	
		cutting process. Wear cutting tools; wear	
		criteria. Durability of cutting tools. Cutting	
		parameter parameters: speed, feed, depth	
		of cut. The kinematic chain theory.	
		Mechanism: definition, transfer ratio, linking	
		the series. Kinematic chain: definition,	
		classification, structure. Adjustment of	
		kinematic chains. Links between kinematic	
		chains. Closed kinematic chains. The main	
		kinematic chain. Defining. Specific	
		structures. The theory of speed.	
		Mechanisms for speed adjustment of	
		gears: ballad block mechanisms, with	
		articulated, mixed wheels, with simple or	
		complex intermediate. Mechanisms for	
		continuously adjusting the speed:	
		definition, structure, characteristics;	
		constructive solutions of mechanical	
		variators. The kinematic feed chain.	
		Defining. Specific structures. Overlapped	
		breasts. Specific regulation mechanisms.	
		Kinematic chains and intermittent feeders.	
		Kinematic threading chains, threading	
		boxes. Special purpose mechanisms.	
		Mechanisms for reversing the rotation	

direction: generalities, classification,
constructive solutions. Mechanisms for
transformation of movement: generalities,
classification. Transformation mechanisms
with self-reversing: bell-crank, oscillating
sliding, rotating sliding, Transforming
mechanisms without auto-reversal: screw-
nut, pinion-rack, Cutting schemes, Fields of
use. Classification. The normal lathe.
Revolver lathe (horizontal and vertical).
The vertical lathe. Milling machines.
Cutting schemes Fields of use
Classification. Milling machine with
console. Planar milling machine.
Longitudinal milling machine Drilling
machines. Cutting schemes. Fields of use.
Classification. Banio drilling machine.
Column Drilling Machine. Drilling machine
with pillar. Radial drilling machine. Planing
machines. Boring and milling machine.
Planing machines: cutting schemes, fields
of use, classification, Shaper, Slotting
machine. Boring and milling machine: fields
of use, classification, construction, Pickups,
Grinding machines. Spinning machine:
use, classification, construction, Grinding
machines: areas of use. classification.
cutting schemes, abrasive bodies, External
grinding machine. Inner grinding machine.
The content of the seminar or practical
works:
1. Introductory work; the general
presentation of the laboratory, the
machine-tool room, the scope and content
of the practical works. 2. Kinematic
analysis of the normal lathe. 3. Kinematic
analysis of the milling machine - 2 hours. 4.
Kinematic analysis of the drilling machine.

5. Kinematic analysis of sept	oticemia. 6.
Kinematic analysis of the grindin	ng machine.
7. Machine control systems.	-
2-nd Year 1 Mechanics	5
Course content:	
Recapitulative notions about	out vector
operations, principles and	
the axioms of mechanics. Mome	ents theory:
Moment of force in relation to a	a point and
an axis; Central Axis Reducti	ion Cases;
Reducing particular systems	of forces;
Center of Parallel Forces. Stati	ic moments
and centers of gravity, Guldin's	s theorems.
Equilibrium of rigid subject to id	deal bonds,
types of bonds. Methods and the	heorems in
statics of material systems	: Element
isolation method; Method of so	olidification;
Method of isolating parts. Bea	am beams.
Rubbing in the technique: Rubb	ing; Rolling
friction; Pivoting rubbing; Rubbi	ing in joints
and bearings. Static of varies	s: General
equation of yarns; Wire	rubbing.
Applications in static technique:	Parga and
inclined plane; Scrapers a	and pulley
systems; Even the screw; B	Brake band
brake and sabot brake. Point	Cinematic:
Coordinate Systems; Spe	eed and
acceleration; Particular moves of	of the point.
The content of the seminar o	or practical
works:	-
S1 - Introduction - vector	operations.
Applications. S2 - Moment of fo	orce relative
to a point and an axis. Applica	tions CO
Reduction of force systems, c	ations. 53 -
reduction access Applications	center axis,
	center axis, S4 - Table
Centers. Applications. S5 - Equ	center axis, S4 - Table Juilibrium of
Centers. Applications. S5 - Equation the rigid subject to idea	center axis, S4 - Table juilibrium of al bonds.

			systems. Applications. S7 - Friction	
			systems. Applications.	
	2-nd Year	1	Mechanisms	4
			Course content:	
			Introduction. Definitions. Structure and	
			configuration of planar mechanisms.	
			Kinematic element. The kinematic	
			coupling. Kinematic chain (definition,	
			classification, degree of freedom, kinematic	
			group). Mechanisms (definition,	
			classification, degree of mobility).	
			Configuration analysis and kinematics of	
			mechanisms. Vector connection equations	
			for configuration, speeds and	
			accelerations. Polygonal vector outline	
			method for solving. configuration and	
			kinematics of the mechanisms. Examples.	
			Spatial Mechanisms. The cardan coupling	
			mechanism. RRSC spatial patroller. RSSR	
			spatial patroller. White mechanism - spatial	
			crank. Force analysis of mechanisms.	
			Engine loads, resistant, exterior, interior,	
			variable, inertia. Determination of the	
			reactions of the kinematic couplers of the	
			mechanisms. The dynamics of the	
			mechanisms. The phases of the	
			Balance Uniformize the angular speed	
			with the flywheel Calculation of the	
			moment of inertia of the mass and weight	
			of the steering wheel Adjusting non-	
			periodic variations of machine movement	
			The content of the seminar or practical	
			works:	
			Labor protection rules in the laboratory:	
			Structural analysis of kinematic couplings.	
			Structural analysis of fundamental planar	
			mechanisms. Kinematic analysis of bar	

			mechanisms - bar method Kinematic	
			analysis of bar mechanisms - the method	
			of projection of polygonal contour of	
			vectors Determination of reactions to bar	
			machanisme mothed of kinematic group	
			inections - method of kinematic group	
			Nochanismo Method of isolating	
			Wechanisms - Wethod of Isolating	
			kinematic elements (matrix method).	
			Cinematic analysis of spatial mechanisms	_
	2-nd Year	1	Numerical Methods	5
			Course content:	
			1. ERRORS IN NUMERICAL METHODS.	
			Introduction. Truncation Errors.	
			Representing numbers in your computer.	
			Errors by rounding. LINING EQUIPMENT	
			SYSTEMS DIRECT METHODS.	
			Introduction. Gauss removal and	
			elimination	
			Gauss-Jordan. Pitching and elimination	
			Gauss-standard. Matrix operations.	
			Inversion of a matrix Determinant of a	
			matrix. Private Matrices. ITERATIVE	
			METHODS, Introduction, Vector and matrix	
			rules. The Jacobi method uses the Gauss -	
			Seidel method Relaxation methods	
			Introduction Lagrange interpolation	
			formula Newton interpolation formulas by	
			equidistant nodes. Analysis of polynomial	
			interpolation Cubic spling functions	
			NUMERICAL CUADRATURE Introduction	
			Rule of restande and transzoid rule	
			Simpson's rules Quantum Formulas	
			Simpson's rules. Quantum Formulas	
			The content of the cominer or prectice!	
			The content of the seminar or practical	
			papers:	
			Review of programming knowledge in C ++	
			Errors in numerical methods:	
			CONVERSIA FROM ZECIMAL IN BINAR.	
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			Gauss removal with pivoting. The reverse	
			of a matrix. LU decomposition. Unspecified	
			M systems. The Jacobi method. Gauss-	
			Seidel iterative method. Lagrange	
			interpolation. Cubic spline interpolation.	
			Numerical guadrature: Rectangle method	
			and trapezoid method. Quantum formula	
			Newton-Cotes. VERIFICATION OF	
			KNOWLEDGE.	
	2-nd Year	1	Materials Strength	5
			Course contents:	
			Chapter 1 Introduction: Definitions,	
			structural concepts (bars), requests,	
			approaches. Chapter 2 Cutting forces and	
			bending moments. Chapter 3 Behavior of	
			Materials. Chapter 4 Expansion /	
			Compression of bars. Chapter 5 Straight	
			section cross sections. Chapter 6 Bending	
			of bars. Chapter 7 Bars with circular or	
			annular section; torsion of rectangular	
			cross-section bars. Chapter 8 Sizing /	
			Verification Methodology of Bars.	
			Seminar content or practical works:	
			Seminar	
			1. Efforts diagrams on plain beams and	
			console beams. Efforts diagrams at simple	
			beams with consoles and inclined beams.	
			2. Efforts diagrams of Gerber beams and	
			plain frames. Effort diagrams for bar	
			systems. 3. Calculation of the main center	
			inertia moments of the composite sections	
			with a symmetry axis. Calculation of main	
			center inertia moments of sections without	
			axis of symmetry. 4. Straight bars required	
			for stretching or compression: verification,	
			sizing and resistance calculation.	
			Calculation of unstable static simple axial	

		load systems with temperature variations and displacements due to errors found during assembly. 5. Verification, sizing and calculation of resistance strength of bars required at bending. 6. Calculation of the beams displacements required at bending with the initial parameter method. 7. Verification, sizing and calculation of the resistance strength of the circular (or ring) section bars required at free torsion. Laboratory Learning to work with programs for Straight Bar Resistance and Flat and Bar Systems efforts).	
2-nd Ye	ear 2	Sports	3
		The content of the seminar or practical	Ĭ
		worke	
		1 Procentation of minimal theoretical	
		i. Fresentation of minimal theoretical	
		content regarding the activity of physical	
		education, training for labor protection,	
		presentation of the objectives and	
		requirements of the discipline, support of	
		the initial tests. 2. Repeat the main	
		methods of football - girls and volleyball	
		girls, known from previous cycles.	
		Positioning in attack and defense systems.	
		Bilateral games. Developing the rectifying	
		rate to auditory and visual stimuli. Repeat	
		kick start and launch from start,	
		development of the speed of movement	
		through accelerators on variable distances	
		20-60m. Educating dynamic strength in	
		upper, lower limbs, abdomen and trunk by	
		working in the circuit and by working on	
		workshops. 3. Evaluation with specific	
		scores, the level of movement speed	
		scores, the level of movement speed development and segmental muscle	

approached in semester 2	. Readiness to
effort. Sports Games. 5.	Strengthen the
main elements and techni	ical procedures
specific to sports games. The	neir repetition in
adversity, in a bilateral gar	me. Developing
the elements of coordinat	ting capacity -
rhythm, precision, static	and dynamic
balance. spatio-temporal	I orientation.
combination of movemen	nts, kinesthetic
discrimination, ambidextru	ucture, agility.
Education of aerobic and m	nixed resistance
by the method of uniform	n and variable
efforts 6 Evaluation	with specific
evidence the level of d	levelopment of
resistance and the degree	of mastery of a
sports game	or mastery or a
2 nd Veer 2 Applied Information	3
2-itu real 2 Applied informatics	3
1 Introduction Overview	of the coffware
1. Introduction. Overview (	
application. Opening the	Session. File
types and applications. Pl	rojects. Ribbon
appearance. Show p	anei. Iools.
Customize user commai	nds. 3DModel
panel (Sketch, Create,	Modify, Work
features, Pattern, Surfaces	). Sketch panel
(Constraints, Insert, Format	). Inspect panel
(Measure, Analysis).	Tools panel
(Materials, Options, Clip	oboard, Find).
Manage panel (UpDate	
Styles, Layout, Author, iL	, Parameters,
View panel (Visibility,	, Parameters, .ogic, Content).
Mindows Novigeta) Equir	, Parameters, .ogic, Content). Appearance,
vindows, Navigate). Envir	, Parameters, .ogic, Content). Appearance, ronments panel
(Begin, Convert, Manage)	, Parameters, .ogic, Content). Appearance, ronments panel ). Get Started
(Begin, Convert, Manage) Panel (Launch, My Home,	, Parameters, ogic, Content). Appearance, ronments panel ). Get Started New Features,
(Begin, Convert, Manage) Panel (Launch, My Home, Videos & Tutorials). Vault p	, Parameters, ogic, Content). Appearance, ronments panel ). Get Started New Features, panel. Autodesk
(Begin, Convert, Manage) Panel (Launch, My Home, Videos & Tutorials). Vault p 360 Panel Application (3D	, Parameters, logic, Content). Appearance, ronments panel ). Get Started New Features, banel. Autodesk Model and 2D
(Begin, Convert, Manage) Panel (Launch, My Home, Videos & Tutorials). Vault p 360 Panel Application (3D Representation). 2. 3D mod	, Parameters, logic, Content). Appearance, ronments panel ). Get Started New Features, banel. Autodesk Model and 2D leling of molded

		and use of work tools. Applications. 3. 3D	
		modeling of the board elements. Table	
		development strategy. Specific working	
		tools. Application. 4. 3D modeling of	
		assemblies. Working principles.	
		Application, 5, Develop 3D models of	
		welded parts. Procedures and tools.	
		Application 6 3D design of the mechanical	
		structures in the profiles. Tools and work	
		strategy Applications 7 Specific	
		procedures for 3D modeling of plastic	
		parts Dedicated tools and applications 8	
		Assisted Design of Mechanical	
		Transmission I Trees grooves bearings	
		feathers sealing elements constructive-	
		functional details Applications 9 Assisted	
		design of mechanical transmissions II	
		Automatic calculation and design of	
		cylindrical conical and worm dears 10	
		Assisted Design of Mechanical	
		Transmissions III Automatic calculation	
		and design of belts and chains	
		The content of the seminar or practical	
		works	
		1 3D modeling of simple landmarks	
		Learning how to work 2 Applications of	
		molded parts of complexity	
		Different Applications for sheet metal	
		parts 4 Developing applications for	
		assemblies of different difficulty parts 5	
		Elaboration of various applications of	
		welded parts 6 Applications for 3D design	
		of the mechanical structures in the profiles	
		7 Solid modeling of plastic parts 8	
		Applications for automatic tree design	
		Modeling of auxiliary elements (bearings)	
		arooves feathers seals) 9 Applications	
		for automatic design of cylindrical conical	
		Tor automatic design or cylinalical, corlical	

			and worm gears. 10. Applications to belt	
			and chain transmissions.	
	2-nd Year	2	English	2
			The content of the seminar or practical	
			works:	
			Semester I - Electrical. Specialized	
			vocabulary and discourse situations.	
			Grammar in focus: Scale of likelihood.	
			Electronics. Specialized vocabulary and	
			discourse situations. Grammar in focus:	
			Subordinate clauses of result and purpose.	
			Civil Engineering. Specialized vocabulary	
			and discourse	
			Situations. Grammar in focus: Comparison	
			of adjectives. Assessment test. Semester II	
			- Energy. Specialized vocabulary and	
			discourse situations. Grammar in focus:	
			Countable and uncountable nouns.	
			Adjectives and adverbs. Petroleum.	
			Specialized vocabulary and discourse	
			situations. Grammar in focus: Prepositions	
			of place. Writing in focus: Description.	
			Plastics. Specialized vocabulary and	
			discourse situations. Grammar in Focus:	
			Quantifiers. Writing in focus: Definition and	
			exemplification. Telecoms. Specialized	
			vocabulary and discourse situations.	
			Writing in Focus: Comparing and	
			Contrasting Ideas. Assessment test.	
	2-nd Year	2	Fluid Mechanics	2
			Course contents:	
			Chapter 1. Measurement units. Fluid	
			properties. The notion of continuous	
			environment. Chapter 2. Fluid statics:	
			Pressure and pressure measurement.	
			Hydrostatic forces on flat surfaces. Relative	
			equilibrium of fluids with free surface in	
			rectilinear motion or rotation. Forces that	

 			act on immersed bodies - the principle of	
			Archimedes. Chapter 3. Basic equations of	
			fluid mechanics: Notions of fluid	
			kinematics. Total Derivative. The gearbox.	
			Acceleration field. Line current equation.	
			The infinitesimal fluid element method.	
			Bernoulli's equation. The laws	
			fundamental preservation of mass, impulse	
			and energy. Equation of continuity. Chapter	
			4. Navier-Stokes Equations: Deduction of	
			the Navier-Stokes equations. Applications	
			in case of laminar flow. Turbulent flow.	
			Chapter 5. Dimensional Analysis and	
			Similarity Theory. Fundamental and	
			derived physical quantities. The principle of	
			dimensional homogeneity. The Rayleigh	
			method. Pi Theorem. Definition of	
			similarity. Analysis of similarity criteria Re,	
			Fr, Sh, Eu, Ma. Model Law. Chapter 6 Limit	
			layer theory. Limit turbulent limit.	
			Applications to flow around bodies.Cap 7	
			Flow through pipes: Laminar flow and	
			turbulence. Effect of viscosity. The motion	
			equation. Friction coefficient and pipe	
			roughness. Local pressure losses.	
			Hydraulic slope and energy slope.	
			Pipelines - pipes connected in series and	
			parallel. Hit of a ram.	
			The content of the seminar or practical	
			papers:	
			Measurement of pressure. Measuring	
			viscosity. Measure the impulse. Reynolds's	
			experience. Flow through pipes:	
			Calculation of friction pressure losses and	
			calculation of local pressure losses.	
			Flow through pipelines: Flow measurement	
			methods. Hit of a ram.	
	 2-nd Year	2	Mechanisms	3

		1. Balancing mechanisms and machines:	
		Course content:	
		Introduction. Definitions. Structure and	
		configuration of planar mechanisms.	
		Kinematic element. The kinematic	
		coupling. Kinematic chain (definition,	
		classification, degree of freedom, kinematic	
		group). Mechanisms (definition,	
		classification, degree of mobility).	
		Configuration analysis and kinematics of	
		mechanisms. Vector connection equations	
		for configuration, speeds and	
		accelerations. Polygonal vector outline	
		method for solving. configuration and	
		kinematics of the mechanisms. Examples.	
		Spatial Mechanisms. The cardan coupling	
		mechanism. RRSC spatial patroller. RSSR	
		spatial patroller. White mechanism - spatial	
		crank. Force analysis of mechanisms.	
		Engine loads, resistant, exterior, interior,	
		variable, inertia. Determination of the	
		reactions of the kinematic couplers of the	
		mechanisms. The dynamics of the	
		mechanisms. The phases of the	
		movement. Motion equations. Energy	
		Balance. Uniformize the angular speed	
		with the flywheel. Calculation of the	
		moment of inertia of the mass and weight	
		of the steering wheel. Adjusting non-	
		periodic variations of machine movement.	
		The content of the seminar or practical	
		works:	
		Labor protection rules in the laboratory;	
		Structural analysis of kinematic couplings.	
		Structural analysis of fundamental planar	
		mechanisms. Kinematic analysis of bar	
		mechanisms - bar method. Kinematic	
		analysis of bar mechanisms - the method	

			of projection of polygonal contour of vectors. Determination of reactions to bar mechanisms - method of kinematic group	
			isolation; Determination of Reactions to Bar	
			Mechanisms - Method of isolating	
			kinematic elements (matrix method).	
			Cinematic analysis of spatial mechanisms.	
	2-nd Year	2	Machine Parts	3
			General problems of machine building.	
			Mechanical engineering calculation	
			principles. Mechanical characteristics of	
			materials used in machine building. Form	
			and dimensional accuracy of car bodies.	
			Calculation at simple and compound	
			queries. Calculation at variable requests.	
			Salety chiena for car boules. Reliability of	
			Threaded joints Welded joints Joining by	
			soldering loint joining Removable	
			assemblies Threaded assemblies thread	
			classification: geometrical elements: screw	
			and nut materials: the friction moment in	
			the thread: auto-fatigue condition: the	
			moment of friction between the nut and the	
			bearing surface: thread calculation:	
			calculation of assemblies with bolts without	
			initial clamping; calculation of assemblies	
			with initial clamping screws; fatigue	
			calculation of assemblies with initial	
			clamping screws; calculation of assemblies	
			with eccentric eccentric screws; calculating	
			the screws required at the shock. Joining of	
			hubs and shafts: feather assemblies; chisel	
			assemblies; pressed assemblies, polygonal	
			assemblies. Elastic assemblies. Springs	
			with traction-compression voltages;	
			Springs with torsional voltages; Springs	
			with bending stresses.	

	2-nd Year	2	Machine Parts	1
		-	Course contents:	.
			Chapter 1 General problems of machine	
			building Chapter 2 Mechanical	
			engineering calculation principles	
			Machanical characteristics of materials	
			used in mechine building Form and	
			dimensional assurage of sor bodies	
			Coloulation at simple and compound	
			Calculation at simple and compound	
			queries. Calculation at variable requests.	
			Safety criteria for car bodies. Reliability of	
			car bodies. Chapter 3. Non-demountable	
			joints. I nreaded joints. Welded joints.	
			Joining by soldering. Joint joining. Chapter	
			4. Removable assemblies. Threaded	
			assemblies: thread classification;	
			geometrical elements; screw and nut	
			materials; the friction moment in the thread;	
			auto-fatigue condition; the moment of	
			friction between the nut and the bearing	
			surface; thread calculation; calculation of	
			assemblies with bolts without initial	
			clamping; calculation of assemblies with	
			initial clamping screws; fatigue calculation	
			of assemblies with initial clamping screws;	
			calculation of assemblies with eccentric	
			eccentric screws; calculating the screws	
			required at the shock. Joining of hubs and	
			shafts: feather assemblies; chisel	
			assemblies; pressed assemblies, polygonal	
			assemblies. Chapter 5. Elastic assemblies	
			Springs with traction-compression	
			voltages; Springs with torsional voltages;	
			Springs with bending stresses.	
			The content of the seminar or practical	
			works:	
			Paper no. 1 - Experimental determination	
			of fatigue resistance. Calculation of fatigue	

1				
			strength of machine parts; Work no. 2 -	
			Experimental determination of the	
			coefficient of friction in screw assemblies;	
			Work no. 3 - Experimental determination of	
			the load bearing capacity of a screwed-in	
			assembled load with transverse forces.	
			Work no 4 - Determination of the stiffness	
			of the elements of an assembly with holts	
			with initial clamping: Work no 5	
			Determination of the carrying capacity of	
			Determination of the carrying capacity of	
			an elastic blacelet assembly, work no. 6 -	
			Experimental determination of load	
			distribution along a joint through bilateral	
			corner welding; Work no. 7 - Experimental	
			determination of the elastic characteristic of	
			helical springs.	
	2-nd Year	2	Domain Practical Training	4
			Course content:	
			General training on occupational safety.	
			General notions about metal cutting.	
			Knowledge and interpretation of	
			technological documentation. Measuring	
			and control equipment. Operations, tools	
			and tools used in locksmiths. Turning,	
			Milling Floating and mooring Correction	
			Casting The Cooperative Workshop	
			Casting Workshop Turning The	
			Workshop Costing Workshop for clopping	
			molded parts Casting Technology for	
			abtaining aget iron with nodular graphite	
			Turning Cast from with nodular graphile.	
			the sulider chine. Cesting technology of	
			the cylinder shim. Casting. Coll Shooting	
			iviacnines. Hot plastic deformation sectors.	
			Thermal and thermo-chemical treatments.	
			Galvanic coatings. Welding. Practice	
			colloquy	
	2-nd Year	2	Materials Strength	3
			Course contents:	

		Chapter 1 Introduction: Definitions,	
		structural concepts (bars), requests,	
		approaches. Chapter 2 Cutting forces and	
		bending moments. Chapter 3 Behavior of	
		Materials. Chapter 4 Expansion /	
		Compression of bars. Chapter 5 Straight	
		section cross sections. Chapter 6 Bending	
		of bars. Chapter 7 Bars with circular or	
		annular section; torsion of rectangular	
		cross-section bars. Chapter 8 Sizing /	
		Verification Methodology of Bars.	
		Seminar content or practical works:	
		Seminar	
		1. Efforts diagrams on plain beams and	
		console beams. Efforts diagrams at simple	
		beams with consoles and inclined beams.	
		2. Efforts diagrams of Gerber beams and	
		plain frames. Effort diagrams for bar	
		systems. 3. Calculation of the main center	
		inertia moments of the composite sections	
		with a symmetry axis. Calculation of main	
		center inertia moments of sections without	
		axis of symmetry. 4. Straight bars required	
		for stretching or compression: verification,	
		sizing and resistance calculation.	
		Calculation of unstable static simple axial	
		load systems with temperature variations	
		and displacements due to errors	
		found during assembly. 5. Verification,	
		sizing and calculation of resistance	
		strength of bars required at bending. 6.	
		Calculation of the beams displacements	
		required at bending with the initial	
		parameter method. 7. Verification, sizing	
		and calculation of the resistance strength	
		of the circular (or ring) section bars	
		required at free torsion.	
		Laboratory Learning to work with programs	

			for Straight Bar Resistance and Flat and	
			Bar Systems efforts).	
	2-nd Year	2	Thermotechnics	2
			Objectives: Presenting some general	
			aspects to establish minimal knowledge	
			about the thermal phenomena encountered	
			in the engineering, fundamental notions	
			regarding thermodynamics of systems.	
			Knowledge of the fundamental	
			thermodynamic notions necessary for the	
			understanding and deepening of the	
			knowledge at the specialized courses of	
			the later years.	
			Course Content. Fundamentals of	
			thermodynamics: energy, sources and	
			energy receptors. Energy systems,	
			thermodynamic systems. Thermodynamics	
			Postulates. Study of closed, homogeneous,	
			unitary thermodynamic systems. Simple,	
			reversible, open gas transformations.	
			Study of thermodynamic system in	
			stabilized flow. Homogeneous and non-	
			uniform thermodynamic system (perfect	
			gas mixtures). Thermodynamics of thermal	
			agents: vapor thermodynamics; moisture	
			saturated vapor states; constant title	
			curves, relationships between vapor state	
			sizes; Capeyron-Clausius equation; vapor	
			state transformations (isochoric, isobar,	
			solicitation, reversible and ineversible	
			adiabatic). Wet all thermodynamics, the	
			diagram: graphical determination of wet air	
			status: Simple wet air conversione	
			constant humidity content constant	
			temperature constant enthality and mixing	
			of two wet air flows with different states)	
			Thermodynamics of compressible fluids at	
			Thermodynamics of compressible hulds at	

			high speeds. Thermodynamics of fuel	
			combustion. Thermodynamics of thermal	
			machine cycles.	
	2-nd Year	2	Dimensional Control and Tolerances	3
			Course contents:	
			Introduction. Object and importance of	
			discipline. The principle of	
			interchangeability. Dimensional precision.	
			Dimensions, deviations, tolerances. Fits.	
			Adjustment systems. System of tolerances	
			and ISO adjustments. Microgeometric	
			precision. Surface corrugation and	
			roughness; causes of their occurrence,	
			characteristics, physical parameters and	
			roughness statistics; enrollment on their	
			drawing. Roughness evaluation	
			techniques. Precision of geometric shape.	
			Deviations of the macrogeometric form.	
			Definition of deviations, graphical	
			representations, marking tolerances of	
			form on drawings. Techniques for	
			assessing macroeconomic precision.	
			Precision of orientation and reciprocal	
			position. Deviations from orientation,	
			deviations from the relative position of	
			surfaces, radial beating and frontal beating:	
			definition, cases, representations, drawing	
			on the drawing. Techniques to control	
			them. Chains of dimensions. Definition,	
			classification and methods for resolving	
			size chains. Methods and means of	
			measurement and control. Classification of	
			dimensional control methods. Metrological	
			features. Measurement errors. Universal	
			dimensional control means. Tolerances,	
			adjustments and control of smooth tapered	
			assemblies, bearings and feather	
			assemblies. Tolerances, adjustments and	

		control of threaded assemblies.	
		Tolerances, adjustments and control of	
		gears and gears.	
		The content of the seminar or practical	
		works:	
		1. Conducting work safety training, taking	
		students into account, presenting the	
		laboratory and laboratory work.	
		Presentation of the universal measuring	
		instruments used in laboratory work. 2.	
		External and internal dimension control	
		with vernier and micrometric tools. 3.	
		Control of dimensions and deviations from	
		the geometric shape by means of	
		comparators. 4. Measurement of surface	
		roughness. 5. Measure angles and	
		conicities. 6. Thread measurement. 7.	
		Toothed wheel control. 8. Using ISO	
		standards for calculations with tolerances	
		and adjustments. Identifying the elements	
		that define a tolerated dimension,	
		establishing limit deviations for a tree and a	
		bore, plotting the limit deviations and	
		tolerance fields for the shaft and bore,	
		calculating their tolerances. Identifying the	
		type of adjustment and the system of	
		adjustments in which it is formed, graphical	
		representation of the fitting, determining	
		the boundary characteristics in an	
		assembly, calculating the tolerance of a fit.	
		Enumeration of dimensional tolerances on	
		reference drawings and fittings on the	
		overall drawings. 9. Solving the	
		dimensional chains 10. Completing the	
		reports on the laboratory works performed.	
		Restoration of a laboratory work not	
		performed. Verification of the papers and	
		final mark of the students in the laboratory	

			activity.	
			Dimensional Control and Tolerances	
			Course contents:	
			Introduction. Object and importance of	
			discipline. The principle of	
			interchangeability. Dimensional precision.	
			Dimensions, deviations, tolerances, Fits,	
			Adjustment systems. System of tolerances	
			and ISO adjustments. Microgeometric	
			precision. Surface corrugation and	
			roughness: causes of their occurrence.	
			characteristics, physical parameters and	
			roughness statistics: enrollment on their	
			drawing. Roughness evaluation	
			techniques. Precision of geometric shape.	
			Deviations of the macrogeometric form.	
			Definition of deviations, graphical	
			representations, marking tolerances of	
			form on drawings. Techniques for	
			assessing macroeconomic precision.	
			Precision of orientation and reciprocal	
			position. Deviations from orientation,	
			deviations from the relative position of	
			surfaces, radial beating and frontal beating:	
			definition, cases, representations, drawing	
			on the drawing. Techniques to control	
			them. Chains of dimensions. Definition,	
			classification and methods for resolving	
			size chains. Methods and means of	
			measurement and control. Classification of	
			dimensional control methods. Metrological	
			features. Measurement errors. Universal	
			dimensional control means. Tolerances,	
			adjustments and control of smooth tapered	
			assemblies, bearings and feather	
			assemblies. Tolerances, adjustments and	
			control of threaded assemblies.	
	2-nd Year	2	Tolerances, adjustments and control of	3

				gears and gears.	
				The content of the seminar or practical	
				works:	
				1. Conducting work safety training, taking	
				students into account, presenting the	
				laboratory and laboratory work.	
				Presentation of the universal measuring	
				instruments used in laboratory work, 2,	
				External and internal dimension control	
				with vernier and micrometric tools, 3.	
				Control of dimensions and deviations from	
				the geometric shape by means of	
				comparators 4 Measurement of surface	
				roughness 5 Measure angles and	
				conjcities 6 Thread measurement 7	
				Toothed wheel control 8 Using ISO	
				standards for calculations with tolerances	
				and adjustments. Identifying the elements	
				that define a tolerated dimension	
				establishing limit deviations for a tree and a	
				bore plotting the limit deviations and	
				tolerance fields for the shaft and hore	
				calculating their tolerances. Identifying the	
				type of adjustment and the system of	
				adjustments in which it is formed graphical	
				representation of the fitting determining	
				the boundary characteristics in an	
				assembly calculating the tolerance of a fit	
				Enumeration of dimensional tolerances on	
				reference drawings and fittings on the	
				overall drawings and numps on the	
				dimensional chains 10 Completing the	
				reports on the loboratory works performed	
				Postoration of a loboratory works performed.	
				Residuation of a laboratory WORK NOT	
				final mark of the students in the laboratory	
				activity	
			4	activity.	4
		3-ra year		Hydraulic and Pheumatic Drives	4

Course content: General elements of structure of hydropneumatic systems. Organism of hydropneumatic systems. Organism of hydrogneumatic systems. distribution equipment. Pressure regulating equipment. flow regulation equipment. Auxiliary equipment for hydraulic schemes. Hydraulic schemes for different cycles. General notions about penetrating actions. Compressed air leakage. Pneumatic discharge components. Pneumatic valves. compressed air filtration. Lubrication of compressed air filtration. Lubrication of compressed air filtration. Lubrication of hydrostatic drive systems and its symbolization. Hydraulic pumps (with gears, pallet, axial pistons) Construction- functional analysis of drawers with drawers Construction- functional analysis of the pressure and flow control equipment. Single acting pneumatic cylinder with direct control and indirect control. Functional pneumatic schemes. Elasticity Course content: Generalities on Elasticity Theory. The theory of tensions. The theory deformed. Relationships between stresses and specific deformations. Mechanical work and potential deformation energy. Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:		-	-		
General elements of structure of hydrostatic systems. Grogenism of hydrostatic systems. distribution equipment. Pressure regulating equipment. flow regulation equipment. Auxiliary equipment for hydraulic schemes. Hydraulic schemes for different cycles. General notions about penetrating actions. Compressed air leakage. Pneumatic discharge components. Pneumatic valves. compressed air filtration. Lubrication of compressed air filtration. Lubrication of the seminar or practical works: The content of the seminar or practical works: The apparatus that is part of the hydrostatic drive systems and its symbolization. Hydraulic pumps (with gears, pallet, axial pistons) Construction- functional analysis and calculation of hydraulic cylinders. Functional analysis of drawers with drawers Constructional- functional analysis of the pressure and flow control equipment. Single acting pneumatic cylinder with direct control and indirect control. Functional pneumatic schemes. Elasticity Course content: Generalities on Elasticity Theory. The theory of tensions. The theory deformed. Relationships between stresses and specific deformations. Mechanical work and potential deformation energy. Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:				Course content:	
hydropneumatic systems. Organism of hydropneumatic systems. Organism of hydrostatic systems. Otisthution equipment. Pressure regulating equipment. flow regulation equipment. Auxiliary equipment for hydraulic schemes. Hydraulic schemes for different cycles. General notions about penetrating actions. Compressed air leakage. Pneumatic discharge components. Pneumatic valves. Compressed air, neumatic schemes. The content of the seminar or practical works: The content of the seminar or practical works: The apparatus that is part of the hydrostatic drive systems and its symbolization. Hydraulic pumps (with gears, pallet, axia pistons) Construction- functional analysis and calculation of hydraulic cylinders. Functional analysis of drawers with drawers Constructional- functional analysis of the pressure and flow control equipment. Single acting pneumatic cylinder with direct control and indirect control. Functional pneumatic schemes. Elasticity Course ontent: Generalities on Elasticity Theory. The theory of tensions. The theory deformed. Relationships between stresses and specific deformations. Mechanical work and potential deformation energy. Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:				General elements of structure of	
hydrostatic systems. distribution equipment, Fressure regulating equipment, flow regulation equipment. Auxiliary equipment for hydraulic schemes. Hydraulic schemes for different cycles. General notions about penetrating actions. Compressed air leakage. Pneumatic discharge components. Pneumatic valves, compressed air filtration. Lubrication of compressed air filtration. Lubrication of compressed air leakage. Pneumatic works: The content of the seminar or practical works: The apparatus that is part of the hydrostatic drive systems and its symbolization. Hydraulic pumps (with gears, pailet, axial pistons) Construction- functional analysis of aclaulation of hydraulic cylinders. Functional analysis of drawers with drawers Constructional- functional analysis of the pressure and flow control equipment. Single acting pneumatic cylinder with direct control and indirect control. Functional pneumatic schemes. Elasticity Course content: Generalities on Elasticity Theory. The theory of tensions. The theory deformed. Relationships between stresses and specific deformations. Mechanical work and potential deformation energy, Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:				hydropneumatic systems. Organism of	
equipment. Pressure regulating equipment.   flow regulation equipment. Auxiliary   equipment for hydraulic schemes.   Hydraulic schemes for different cycles.   General notions about penetrating actions.   Compressed air leakage.   Compressed air pneumatic valves.   compressed air.   Compressed air.   The content of the seminar or practical works:   The apparatus that is part of the hydrostatic drive systems and its symbolization.   Hydraulic cylinders.   Functional analysis and calculation of functional analysis of drawers with drawers Constructional functional analysis of the pressure and flow control equipment.   Sinder with direct control and indirect control and indirect control equipment.   cylinder with direct control and indirect control equipment.   Course content:   Generalities on Elasticity Theory.   Relationships between stresses and specific deformations.   Relationships between stresses and specific deformations.   Relationships between stresses and specific deformation energy.   Particular cases of voltage state.   Papers:				hydrostatic systems. distribution	
flow regulation equipment. Auxiliary equipment for hydraulic schemes. Hydraulic schemes for different cycles. General notions about penetrating actions. Compressed air leakage. Pneumatic discharge components. Pneumatic valves. compressed air, neumatic schemes. The content of the seminar or practical works: The apparatus that is part of the hydrostatic drive systems and its symbolization. Hydraulic pumps (with gears, pallet, axial pistons) Construction- functional analysis and calculation of hydraulic cylinders. Functional analysis of drawers with drawers Constructional- functional analysis of the pressure and flow control equipment. Single acting pneumatic cylinder with direct control and indirect control. Functional pneumatic schemes. Elasticity Course content: Generalities on Elasticity Theory. The theory of tensions. The theory deformed. Relationships between stresses and specific deformations. Mechanical work and potential deformation energy. Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:				equipment. Pressure regulating equipment.	
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control equipment. Single acting pneumatic cylinder with direct control and indirect control. Functional pneumatic schemes.   Elasticity   Course content:   Generalities on Elasticity Theory. The theory of tensions. The theory deformed. Relationships between stresses and specific deformations. Mechanical work and potential deformation energy. Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:				functional analysis of the pressure and flow	
cylinder with direct control and indirect control. Functional pneumatic schemes.   Elasticity   Course content:   Generalities on Elasticity Theory. The theory of tensions. The theory deformed.   Relationships between stresses and specific deformations. Mechanical work and potential deformation energy.   Particular cases of voltage state. Flat problems in elasticity theory.   The content of the seminar or practical papers:				control equipment. Single acting pneumatic	
control. Functional pneumatic schemes.   Elasticity   Course content:   Generalities on Elasticity Theory. The   theory of tensions. The theory deformed.   Relationships between stresses and   specific deformations. Mechanical work   and potential deformation energy.   Particular cases of voltage state. Flat   problems in elasticity theory.   The content of the seminar or practical   papers:				cylinder with direct control and indirect	
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and potential deformation energy. Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:				specific deformations. Mechanical work	
Particular cases of voltage state. Flat problems in elasticity theory. The content of the seminar or practical papers:				and potential deformation energy.	
problems in elasticity theory. The content of the seminar or practical papers:				Particular cases of voltage state. Flat	
The content of the seminar or practical papers:				problems in elasticity theory.	
papers:				The content of the seminar or practical	
				papers:	
3-rd Year 1 Applications to the state of tension at a 5		3-rd Year	1	Applications to the state of tension at a	5

			point in a body. Main stresses and main	
			directions of the voltage state Applications	
			directions of the voltage state. Applications	
			to the deformation state at a point in a	
			body. Relationships between stresses and	
			specific deformations. Apply Hooke's	
			generalized law. Applications to the flat	
			state of stress and deformation.	
			Machine Parts II	
			Course content:	
			Mechanical transmission through gearing.	
			Classification of gears. Materials, thermal	
			treatments for gears and teeth	
			technologies. Causes of gear loss.	
			Cylindrical gears with straight teeth:	
			geometrical elements, calculation of the	
			cylindrical gear with straight teeth at	
			bending and contact. Cylindrical gears with	
			inclined teeth geometrical elements	
			equivalent gear forks in cylindrical gear	
			with inclined teeth calculation of cylindrical	
			gear with teeth inclined at bending and	
			geal with teeth inclined at bending and	
			tooth reference plane wheel geometric	
			leeth, reference plane wheel, geometric	
			elements of the conical gear with straight	
			teeth, conical gears calculation with	
			straight teeth at bending and contact;	
			Cross-axle gears: classification, worm	
			gears: geometric and kinematic elements,	
			materials, forces in the worm gear, worm	
			gear calculation and contact; Heat	
			calculation of gears; Mechanisms with	
			gears. Friction wheel drive Classification;	
			Calculation of cylindrical friction wheel	
			transmissions; Calculation of transmissions	
			with conical friction wheels; Variators with	
			friction wheels. Belt transmissions	
			Classification; Traction capability. Forces	
	3-rd Year	1	and main stresses in a belt, Calculation of	2

		wide belt transmissions, V-Belt
		transmission calculation, Belt drives. Chain
		transmissions Classification. Force in chain
		transmission. Chain transmission
		calculation. Axes and trees Classification.
		materials tree pre-dimensioning fatigue
		checking rigidity check critical speed
		check Slip Bearings Construction
		materials calculation of friction bearings I
		M calculation of hydrodynamic bearings 0,
		hydrostatic bearings Rolling bearings
		(bearings) Classification Symbolisation
		Calculation of durability of rotating
		bearings calculation of non-rotating
		bearings, calculation of hearings Clutches
		Fixed permanent couplings Permanent
		compensating couplings, I crimation
		couplings Automatic intermittent couplings
		Safety couplings. The organs of the white
		crank mechanism Force in the crank
		mechanism Distons Biola: the calculus
		Crankshafts
		The content of the seminar or practical
		works:
		Paper no. 1 - Generating teeth in evolution
		by the rolling method. Work no. 2 -
		Restoration of the geometric elements of a
		straight gear with straight teeth. Work Nr. 3
		- Determination of the equivalent cylindrical
		gear elements for cylindrical and conical
		gears. Work no. 4 - Elastic sliding and
		traction characteristic of belts. Work no. 5 -
		Theoretical determination of friction losses
		in bearings. Work no. 6 - Determination of
		the pressure distribution in the lubricating
		film in the hydrodynamic lubrication sliding
		bearings. Work Nr. 7 - Determination by
	 	calculation of the operating characteristic of

			elastic couplings.	
			Materials Strength III	
			Course content:	
			Calculation of helical spring resistance;	
			stiffness of the helical spring. Bars of equal	
			resistance to bending; calculating the	
			resistance of the arch arch. Overview of	
			the finite element method. Thin wall	
			rotating containers. Tubes with thick walls;	
			tube milling; discs in rotation motion. Flat	
			plate plates equations. Plate in flat voltage	
			state. Flat plates with small arrows.	
			The content of the seminar or practical	
			works:	
			1. Use of elastic elements in supporting the	
			bar systems. 2. Dimensioning of a	
			cylindrical tank and a spherical tank	
			(analytical and using the finite element	
			method). 3. Calculation of voltage boards.	
			4. Calculate rectangular plates with small	
			arrows. 5.Dimensioning of pipelines	
			(analytical - thick wall tubes and finite-axis	
			modeling). 6. Applying hydrostatic pressure	
	3-rd Year	1	to a plate.	4
			Thermotechnics II	
			Course Content	
			Fundamentals of thermotechnics:	
			energy, sources and energy receptors.	
			Energy systems, thermodynamic	
			systems. Thermodynamics Postulates.	
			Study of closed, homogeneous, unitary	
			thermodynamic system Simple	
			reversible open das transformations	
			Poriodic open thermodynamic study	
			Ctudy of thermodynamic study.	
			Study of thermodynamic system in	
			stabilized flow. Homogeneous and	
	 3-rd Year	1	non-uniform thermodynamic system	5

		(perfect gas mixtures). Potential	
		thermodynamics: thermodynamics	
		methods; the exergy of a fluid in	
		continuous flow and permanent	
		regime; the exergy of a fluid in a closed	
		volume; chemical exergy.	
		Thermodynamics of thermal agents:	
		vapor thermodynamics; moisture	
		saturated vapor states; constant title	
		curves; relationships between vapor	
		state sizes; Capeyron-Clausius	
		equation; vapor state transformations	
		(isocratic, isobar, isothermal, reversible	
		and irreversible adiabatic). Wet air	
		thermodynamics: the physical	
		properties of wet air; i-x wet air	
		diagram; graphical determination of	
		wet air status; Simple wet air	
		conversions (constant humidity	
		content, constant temperature,	
		constant enthalpy and mixing of two	
		wet air flows with different states).	
		Thermodynamics of compressible	
		fluids at high speeds. Thermodynamics	
		of combustion of fuels.	
		Thermodynamics of thermal machine	
		cycles.	
		Application Content	
		Methods of temperature measurement.	
		Measurement of gas pressure, velocity	
		and flow. Determination of the	
		pressure-vapor pressure dependence.	
		Determination of wet air parameters.	
		Determination of flow rate with	

Tribology	
Course content:	
Tribology - introduction. Definitions, short	
history. Objectives of tribology,	
interdisciplinarity of tribology. Tribology and	
global environment, requirements and	
perspectives. Head. 1. Basic notions and	
concepts in tribology. Tribosystems:	
structure, functions, demands, systemic	
analysis in tribology. Methods for	
tribological testing: classification.	
tribological test chain. Test systems.	
Modeling and simulation of tribological	
phenomena and processes. Head, 2	
Interactions between triboelements.	
Contact processes. The mechanic of	
hertzian contact. Friction processes:	
theories of friction and wear; friction	
modes, slip-slip peculiarities (stick-slip	
effect) and rolling friction. Wearing	
processes: adhesion wear, abrasion wear,	
superficial fatigue wear, corrosion wear	
and fretting wear, cavitation wear,	
particular or combined wear, wear and	
tear. Head. 3. Triboelement properties.	
Materials used in tribological applications.	
The superficial layer and its tribological	
parameters. Changing the superficial layer	
properties. Head. 4. Lubricants.	
Classifications. Physical and chemical	
properties of oils; viscosity, additives.	
Mineral oils. Synthetic oils.Unsori.	
Vegetable and animal oils and greases.	
Solid lubricants. Unconventional lubricants.	
Self-lubricating composites. Chapter 5.	
Lubrication regimes (limit, mixed, fluid:	
hydrodynamic, hydrostatic, gas-dynamic).	
3-rd Year 1 The elastohydrodynamic regimen (EHD).	2

		Chapter 6. Seals. Technical and	
		environmental requirements imposed on	
		seals. Materials for sealing. Types of seals.	
		Sealing systems. Chapter 7. Machine and	
		machine lubrication, engine lubrication.	
		Processes and Jubricating devices.	
		Lubrication Schemes and Installations.	
		Organizing the lubrication activity.	
		The content of the seminar or practical	
		works:	
		Laboratory: 1. Lubricants: recognition,	
		operation with product catalogs, national	
		and international, environmental legislation	
		on fresh and used lubricants. 2.	
		Determination of mineral oil properties:	
		measurement of kinematic viscosity with	
		capillary viscometers. 3. Study of the	
		influence of load, body materials in contact	
		and geometry on the characteristics of	
		hertitian contact. 4. Friction and wear tests	
		on the tribods of the pin / disc; determining	
		the coefficient of friction for different	
		materials. 5. Surface topography:	
		realization of 2D and 3D digital profiles for	
		new and used surfaces, interpretation of	
		roughness parameters. 6. Friction study in	
		threaded assemblies. 5. Identification and	
		characterization of wear damage. 7. Case	
		study: organizing the lubrication activity in	
		a mechanical section. Domestic Themes:	
		Identification, characterization and	
		equivalence of lubricating oils (10 oils).	
		Study of influence of load, body materials	
		in contact and geometry on the	
		characteristics of hertitian contact. The	
		study	
		loading influences, body materials in	
		contact, and thread type on friction in	

			threaded assemblies.	
			Mechanical Vibrations	
			Course contents:	
			Cap. 1 Mechanical vibrations - general	
			considerations. Introductory notions.	
			Classification of vibrations Characteristic	
			dimensions Measurement units Elements	
			of vibration kinematics Representing	
			vibrations using rotating vectors	
			Composition of harmonic vibrations Head	
			2 Vibrations of linear elastic systems with a	
			degree of freedom 1 Free unborn	
			vibrations Torsional vibrations Elastic	
			constants 2 Free damp vibrations in	
			viscous damping systems Logarithmic	
			Decrement 2 Forced vibrations in evotame	
			with a degree of freedom Foreed	
			with a degree of freedom. Forced	
			bermania disturbing force. System behavior	
			narmonic disturbing force. System behavior	
			in resonance. System behavior near	
			resonance. 4. Forced vibration damping in	
			systems with a degree of freedom. Forced	
			vibrations with damping, excited by	
			harmonic disturbing force. Forced	
			vibrations with damping, excited by	
			disturbing force produced by unbalanced	
			rotating mass. 5. I ransmisibilitate. System	
			excitement through the base. Isolation anti-	
			vibration. Energy aspects of system	
			vibrations with a degree of	
			Freedom. Head. 3 Vibrations of linear	
			elastic systems with finite number of	
			degrees of Freedom. 1. Free vibrations of	
			systems with finite number of degrees of	
			freedom. Establishing motion equations	
			using the D'Alembert Principle. Influence	
			coefficient method. Using Lagrange	
	3-rd Year	1	equations. Own modes of vibration. The	4

		orthogonality of their own vibrational forms.	
		2. Forced vibrations without damping of	
		systems with finite number of degrees of	
		freedom. Determination of Differential	
		Equations with the D'Alembert Principle.	
		The dynamic absorber. Use of influence	
		coefficients for determination of differential	
		equations. 3. Studious vibration study	
		without damping using modal analysis. 4.	
		Free damp vibration. Forced vibration	
		damping. Study of vibration damped using	
		the complex form of spinning vectors.	
		Head. 4 Vibration of continuous systems.	
		Longitudinal vibrations of straight bars.	
		Turning vibrations of straight bars of	
		circular cross section. Bending vibrations of	
		straight beams. Head. 5 Approximate	
		methods in the study of vibrations. The	
		Holzer-Tolle method. Transfer matrix	
		method. Matrix iteration method. The	
		Rayleigh method. Head. 6 Vibration	
		measurement. Measured sizes.	
		Components of a measurement system.	
		Vibration generators. Vibration caps.	
		Measuring systems.	
		The content of the seminar or practical	
		works: 1. Introduction.Recapitulation of the	
		necessary notions from previously studied	
		subjects.Protectia muncii. 2. Free	
		vibrations without damping in systems with	
		a degree of freedom. 3. Free damping	
		vibrations in systems with a degree of	
		freedom. 4. Forced vibrations in systems	
		with a degree of freedom. 5. Free	
		vibrations without damping in systems with	
		finite number of degrees of freedom. 6.	
		Forced vibrations without damping in	
		systems with finite number of degrees of	

			freedom. Application work. 7. The dynamic	
			absorber. 8. Vibrations in continuous	
			systems. 9. Approximate methods in the	
			study of vibrations.	
			Finite Element Analysis I	
			Course content:	
			1. Generalities on Finite Element Analysis.	
			2. Shift method used at bars. 3. Finite	
			element method. 4. Typical types of finite	
			elements. 5. Applications in using the finite	
			element method.	
			The content of the seminar or practical works:	
			1. Initiation in the use of finished elements	
			software and the COSMOS finite element	
			package, 2. Study of bar-shaped	
			structures. 3. Study of plate-shaped	
			structures. 4. Study of molded structures	
	3-rd Year	2	with boards and bars.	5
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		_	Biomechanics	
			Biomechanics Course content:	
			Biomechanics Course content: Introduction to Biomechanics, object of	
		_	Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance.	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology;	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for the transformation of the assembly of CT	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for the transformation of the assembly of CT sections into 3D surfaces that delimit	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for the transformation of the assembly of CT sections into 3D surfaces that delimit tissues according to their densities.	
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			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for the transformation of the assembly of CT sections into 3D surfaces that delimit tissues according to their densities. Biomechanics of the osteo-articular system; bone; cartilage; ligament, joint.	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for the transformation of the assembly of CT sections into 3D surfaces that delimit tissues according to their densities. Biomechanics of the osteo-articular system; bone; cartilage; ligament, joint. Biomechanics of the muscular system;	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for the transformation of the assembly of CT sections into 3D surfaces that delimit tissues according to their densities. Biomechanics of the osteo-articular system; bone; cartilage; ligament, joint. Biomechanics of the muscular system; locomotor movement; types bone lesions,	
			Biomechanics Course content: Introduction to Biomechanics, object of study, terminology, aspects basic biomechanics; sagittal, frontal and transverse reference systems; kinematic aspects of the moving anatomical segments; static and dynamic balance. Basic Aspects of Anatomy and Physiology; cell, tissue. Presentation of programs for the transformation of the assembly of CT sections into 3D surfaces that delimit tissues according to their densities. Biomechanics of the osteo-articular system; bone; cartilage; ligament, joint. Biomechanics of the muscular system; locomotor movement; types bone lesions, muscle. Anthropometry; the proportion of	

percentages	
Seminar or Practical Content:	
Using the lossens taught at the course and	
2D coopping and finite element applysic	
the stress states of the bane and articular	
the stress states of the bolie and alticular	
System are analyzed. Making models with	
SD linisties for bones and teetin. The	
calculation of strength and stability of long	
bones (femur,	
numerus) with a custom load for each	
student. Calculation	
Applied Electronics	
Course content:	
ELECTRONIC CIRCUIT DEVICES.	
Semiconductor electrical conduction	
concepts. Electronic Components: Diodes,	
Bipolar transistors. Unipolar transistors,	
Special semiconductor devices.	
AMPLIFIERS AND OSCILATORS. General	
properties and features of the amplifiers.	
AC Amplifiers (voltage amplifiers, power	
amplifiers). DC power amplifiers. Negative	
reaction to amplifiers and its	
consequences. Perational Amplifiers.	
Oscillators. REDRESSORS NOT MADE	
OF POWER. One-phase single-phase	
rectifiers. Single-phase single-phase	
rectifiers with resistive load. Single-phase	
alternating resistors with resistive load. Re-	
straining the filtered voltage. Three phase	
rectifiers. ELECTRONIC STABILIZERS.	
Parameters of stabilizers. Parametric	
stabilizers. Reacting stabilizers. Integrated	
voltage stabilizers. REDRESSES	
COMBINED BY MICE POWER. Vertical	
and Horizontal Command Principle.	
Specialized cascades for thyristor grid	_
3-rd Year 2 control. COMBINATION AND	3

		T		
			SECVENTIAL LOGIC CIRCUITS.	
			Elementary logical functions. Fundamental	
			relationships in logic algebra. Logical	
			circuits. Integrated logic circuits. Combined	
			Logic Circuits. Sequential sequential logic	
			circuits. APPLICATIONS OF	
			COMBINATION AND SECVENTIAL	
			LOGIC CIRCUITS. Encoders and	
			decoders Electronic counters Numeric-	
			Analog Converters Analog-Numeric	
			Converters Memory circuits Structure of a	
			microprocessor and a microcomputer	
			The content of the seminar or practical	
			workey	
			WOIKS.	
			1. Measuring and control devices specific	
			to the electronics lab (cathodic	
			oscilloscope, electronic voltmeter, signal	
			generator, etc.). 2. Photoelectric elements	
			3. Bipolar and unipolar transistor. 4. AC	
			signal amplifiers for small signals.	
			Operational Amplifiers. Single-phase	
			single-phase rectifiers and filters. Rectifiers	
			Ordered. 6. Continuous voltage stabilizers.	
			7. Combined logic circuits.	
			Lifting and Conveying Machines	
			Course content:	
			General theory and specific organs of lifting	
			and transporting installations - Lifting	
			equipment specific to various fields of	
			activity Ancillary equipment	
			Exploitation of transport equipment -	
			Norms S S M	
			Content of the seminar or practical	
			works	
			Knowledge and assimilation of the specific	
			parts of the lifting and transport aquipment	
	2 rd Vaar	2	using uocumentation Specific Technical Consultations and List	1
	3-ra year	2	Specific Technical Consultations and Use	1

		of ISCIR Standards and Standards.	
		Drawing up specific projects based on	
		design themes specific to the course	
		theme.	
		Internal-combustion engines The course	
		hours and papers undertake a theoretical	
		and experimental study of the thermo-	
		dynamic-mechanical and mechanical	
		processes in order to optimize them the	
		mechanical functioning characteristics a	
		study that allows the graduates to handle	
		the design testing exploitation of the ICE	
		with different destinations	
		Course Content	
		Presentation classification and	
		composition of ICE Power plants with ICE	
		Operation actual operating patterns and	
		operation, actual operating patients and	
		Thermodynamic Processos from ICE Ideal	
		avalage of ICE. The fluide used for the	
		cycles of ICE. The huids used for the	
		operation of ICE. The gas change	
		processes at ICE. The compression	
		process. Formation of fuel mixture and	
		compustion. The process of relaxation.	
		Characteristic parameters of ICE.	
		Overcharging ICE. Static operating	
		characteristics of ICE. Thermal balance	
		sheet of ICE. The power plant of ICE.	
		Ignition system of Spark ignition engine.	
		The supply system of Compression ignition	
		engine.	
		Application Content	
		Types of ICE and energy installations with ICE.	
		Operation ICE of cars. Construction of mobile	
		and fixed parts of the engine. Dismantling and	
		mounting, determining the main dimensions of	
		ICE. Construction of mechanisms and auxiliary	
3-rd Year	2	installations of ICE (distribution, supply,	3

			ignition, lubrication, cooling, supercharging,	
			starting). Experimental determination of the	
			functional characteristics of supply: external	
			characteristic, characteristic of propulsion,	
			characteristic of mechanical loss.	
			Optimization in Mechanical Engineering	
			Course content:	
			1 Introduction Formulation of optimization	
			problems Classification of optimization	
			issues Matrix differential calculus	
			elements Multiple convex conceve	
			functions and convex functions. Ontimal	
			conditions 2 Optimization algorithms for	
			uprostricted issues. Calculate the length of	
			the stop Determining soarch directions	
			a Transform optimization issues Sign	
			s. Hansionni opiinization issues. Sign	
			Linear restrictions 4 Broblems with linear	
			Linear restrictions. 4. Problems with aquality	
			restrictions. Issues with equality	
			restrictions. Allowable directions. Optimal	
			conditions of order one. General procedure	
			for solving. Problems with inequality	
			restrictions. Optimal conditions. General	
			procedure for solving. Updating the set of	
			active restrictions. Criteria for assessing	
			convergence. 5. Problems with nonlinear	
			restrictions. Optimal conditions of order	
			one. Low gradient methods. Generally	
			reduced gradient methods. 6. Multicriteria	
			optimization. Problem formulation. Using	
			synthesis functions. Using Remote	
			Functions. Effective solutions. Sorting	
			criteria. Programming purpose. 7.	
			Optimizing structures. Particularities of	
			optimizing structures. Variables, objective	
			functions and restrictions 8. Reanalysis	
			methods. Direct methods. Using the	
	3-rd Year	2	reverse matrix. The substructure	3

			technique Iterative methods Approximate	
			methodo Low Doop Method Sorial	
			methods. Low base method. Senai	
			development. 9. Methods for solving many	
			variable problems. General presentation.	
			Decomposition methods. Methods for	
			optimizing structure reliability.	
			The content of the seminar or practical	
			works:	
			1. Optimize bar-based structures using	
			spreadsheet programs, 2. Optimization of	
			bar-shaped structures using finite element	
			method 3 Ontimization of plate structures	
			using finite element method	
			Blacticity	
			Course content	
			durse content.	
			1. Introduction Elastoplastic deformations.	
			Perspectives of Nonlinear Calculus.	
			Material models. Numerical approach to	
			elasto-plasticity problems. Elasto-plastic	
			constitutive equations. Generalized method	
			of finite elements. Variational principles	
			and integral forms. 2. Single-dimensional	
			elastic-plastic request. Axial request. The	
			elastic-perfect plastic pattern. Elastoplastic	
			model with isotropic hardening.	
			Elastoplastic model with mixed hardening.	
			Expression of hardening parameters by	
			stress or deformation. The principle of	
			maximum plastic dissination. Integration of	
			alasta plasticity, equations, Heing, eapyoy	
			elasto-plasticity equations. Using convex	
			optimization. Solving elastoplastic	
			problems by finite element method. 3.	
			Elasto-plastic request of bars	
			The elementary approach of the plastic	
			design of the bars. Finished element of	
			elastoplastic Timoshenko beam. Finished	
			beam, cubic, Euler Bernoulli	
	3-rd Year	2	and Timoshenko. The RSBM bar element.	3

			Plastic node method (PNM) / Elasto-	
			plastic flote method (FNM). 4. Elasto-	
			plastic plate request. Bending of plates.	
			Finite elements of the board. Elastoplastic	
			calculation of plate systems. 5. Three-	
			dimensional plasticity. Notations.	
			Mechanics of Continuous Environments.	
			Elasto-plastic behavior. Plasticity J2.	
			Variant formulations used in elasticity and	
			plasticity. Potential thermodynamics and	
			plastic dissipation. Using the finite element	
			method	
			The content of the seminar or practical	
			works:	
			1. The elasto-plastic one-dimensional	
			application Analytical problem solving 2	
			Flasto-plastic request of bars Analytical	
			and numerical solving of problems 3	
			Electic plaque request Numerical	
			problem solving 4 Three dimensional	
			problem solving. 4. Intee-untensional	
			elastoplastic request. Numerical problem	
			solving.	
			Practical Training	
			General training on occupational safety.	
			General notions about metal cutting.	
			Knowledge and interpretation of	
			technological documentation. Measuring	
			and control equipment. Operations, tools	
			and tools used in locksmiths. Turning.	
			Milling, Floating and mooring, Correction,	
			Casting The Cooperative Workshop	
			Casting Workshop Turning The	
			Workshop Casting Workshop for deaning	
			molded parts Casting Technology for	
			abteining east iron with redular graphits	
			Turning cast from with nooular graphite.	
			i urning. Centrifugal casting technology of	
			the cylinder shim. Casting. Coil Shooting	
			Machines. Hot plastic deformation sectors.	
	3-rd Year	2	Thermal and thermo-chemical treatments.	3

			Galvanic coatings. Welding. Practice	
			colloquy	
			Statics and structures stability	
			Course content:	
			Statics of structures. Preliminary elements.	
			The stiffness matrix for a structural	
			element. Transforming loads from the	
			structure element into loads at the nodes.	
			Matrix of rotation. The global axle system.	
			Assembling matrices to obtain equilibrium	
			equations. Stability of bars. General.	
			Computational hypotheses. Freedom	
			degree. Critical force. Loss of stability	
			modes. Aspects of stability of elastically	
			embedded bars in the extremities.	
			Continuous Beam Stability Analysis on	
			Rigid Supports. Behavior of compressed	
			paper in the post-critical field. Straight bar	
			stability in the plastic field. Second order	
			calculation by finite element method. The	
			stiffness matrix of the finite element of the	
			bar used in the second order calculation.	
			The force-displacement relationship for	
			structures. Methods for determining the	
			solution in the second order calculation.	
			Applications on the 2nd order calculation.	
			Bar System Stability Study Using Finite	
			Element Method. The stiffness matrix of	
			the bar element in the stability calculation.	
			Bars articulated at the ends for flat	
			structures. Embedded bar at the ends for	
			flat structures. The articulated bar at the	
			ends of the space structures. The recessed	
			bar at the ends for spatial structures.	
			Practical solving of the stability equation.	
			Generally stiffness matrices reduced. The	
			symmetrical form of the stability equation.	
	3-rd Year	2	Applications for stability analysis of bar	4

				T
			systems using ABAQUS / Cosmos finite	
			element programs.	
			The content of the seminar or practical	
			work:	
			1.Models of complex structures and	
			substructures with the finite element	
			method using specialized programs (in	
			modeling are used all types of finite	
			elements studied at the disciplines.	
			Analysis with finite elements I. Resistance	
			of materials III. Statics, stability and	
			dynamics Structures. Optimizations in	
			Mechanical Engineering), 2. Estimation of	
			stress state by the resistive electrical	
			tensometry method (students learn how to	
			choose the tensometric marks and	
			tensometric rosettes identify the areas	
			where they can be glued, they effectively	
			add soldering technology learn how to	
			handle the acquisition equipment) 3	
			Practice Colloquium - Ending the Activity	
			and Granting the Qualification	
			Thermal Energy Audit	
			Objectives of the discipline: Collection	
			analysis and interpretation of quantitative	
			and qualitative data and information from	
			various alternative sources from	
			professional contexts and literature for the	
			formulation of concrete arguments	
			decisions and approaches	
			Course content:	
			Thermal comfort Thermo-physiological	
			conditions Relationship between thermal	
			comfort parameters Heat demand for	
			beating Transmitting heat to the outside	
			environment The room's overall best	
			check The annual heat and fuel needs	
	∕l₋th Voor	1	Ontimization of thermal protection Clobal	2
	4-111 Teal	1	Optimization of thermal protection. Global	2

			optimization of closure solutions. Heating systems. General problems of heating installations. Categories of thermal agents. Features of heating systems. Criteria for choosing heating systems. Scheme for the distribution of heat. The general scheme of the thermal water installation. Hot and hot water distribution schemes. Heating with heaters. Constructive and functional features of heating bodies. Warm air heating. The specificity of the hot air heating system. Ensuring thermal comfort in warm air space. Variants of the hot air heating system.	
			<b>Thermal-Electrical Plants</b> Objectives of the discipline: Acquiring knowledge in the field of electric and thermal energy production in the thermoelectric and nuclear power plants; Knowledge of processes that take place in the thermoelectric power plants; Identifying the factors that influence the thermoelectric power plants <b>Course content:</b> General principles of electrical and thermal energy production; Centralized thermoelectric steam generators; Solutions to increase the performance of steam thermoelectric power plants. Pumps in the thermoelectric power plant thermal circuit. Cooling plant in thermoelectric power plants; Water treatment in thermoelectric power plants; General considerations regarding the sizing of the thermoelectric power plants; Nuclear power stations	
	4-th Year	1	Practical work contents:	4

			Energy balance for steam boilers; Energy	
			balance for the cooling system in power	
			plants. Heat and mass balances for gas	
			turbine installations; Energy balance for the	
			classical area in a nuclear power plant.	
			Methods for Controlling Pollution	
			Generated by Internal Combustion	
			Engines	
			The influences of various factors on the	
			processes of the internal combustion	
			engine The main polluting products	
			resulting from the burning of fossil fuels	
			Physico-chemical properties and action of	
			the main pollutants. The formation of	
			polluting products in the spark ignition	
			engine The formation of polluting products	
			in the compression ignition engine	
			Neutralization of pollutant emissions from	
			the internal compution angine Filters	
			Ovidation catalysts Logislation on pollutant	
	4-th Year	1	emissions.	4
			Refrigerating Systems and Heat Pumps	
			II	
			Objectives of the discipline.	
			Deepen the processes in refrigeration	
			plants and heat pumps. Analysis, thermal	
			calculation, process optimization.	
			Performance criteria and ways to improve.	
			Areas of use of the cold. The relationship	
			between the cold user and the type of	
			installation. Utilization of secondary energy	
			resources.	
			Course content:	
			Original thermal calculation method	
			Processes in refrigeration plants heat	
			pumps and mechanical vapor compression	
			couplings: one step two and three stage	
	4-th Year	1	cascade Particulars for ammonia and	2
	+-ui i cal		cascaue. Failiculais ioi ammonia anu	2
			freens Thermal calculation elements	
--	-----------	---	--	---
			optimization of performance criteria	
			Brossesses encoifie to observation evidence.	
			Processes specific to absorption systems.	
			One- and two-stage absorption and	
			absorption plants with lithium-water and	
			ammonia water, fields of use. Ejection	
			systems: the theoretical and real process,	
			maintaining the vacuum. The main fields of	
			use of artificial cold: food industry	
			(refrigeration and freezing of products,	
			insulation calculation, setting of cold	
			requirements), artificial ice rinks, ice	
			generators, construction works (soil	
			freezing precoating of concrete	
			components) chemical industry Choice of	
			best exchangers auxiliary equipment and	
			machine selection (compressors, pumpe)	
			machine selection (compressors, pumps),	
			piping dimensioning.	
			Management and Marketing	
			Course Content:	
			1. Introductory Elements. 2. Presentation of	
			the conceptual framework of project	
			management. 3. Persons engaged in	
			project management. 3.1. Categories of	
			people involved in projects. 3.2. Selection	
			of the project manager. Skills and abilities	
			3.3. Managing and managing the project	
			team, 3.4. Methods of organizing project-	
			oriented activities, 4. Pragmatic approach	
			to project plans 4.1 Establishing the	
			methods and tools required by the project	
			1.2 Structure of decomposition work 1.3	
			Structured approach to project	
			monogramont E Cost control and	
			management. 5. Cost control and	
			budgeting of projects 6. Wethods of	
			evaluation and analysis of investment	
		_	projects. 6.1. The problem and the	
	4-th Year	1	specificity of the investment project	3

	1			
			evaluation methods. 6.2. Specificity and	
			role of financial assessment 6.3. The	
			specificity and role of economic	
			assessment, 7. Monitoring and control of	
			projects. 7.1. Planning - monitoring -	
			control cycle 7.2 Data collection and	
			reporting 8 Contracting and Acquisition	
			8.1 Purchasing system cycles 8.2	
			Specific national and European legislation	
			9 Project management in the information	
			9. Floject management information	
			age. 9.1. Project management miorination	
			system 9.2. Internet tools available to	
			project managers. 10. rechniques of	
			internal and external communication.	
			Content of seminar or practical works:	
			Laboratory: Critical road method and PERT	
			diagrams. 2. Pay-back method 3. Method	
			based on the rate of return (internal rate of	
			return). 4. Tools used in project	
			management: Work Breakdown Structures	
			(WBS). 5. Tools used in project	
			management: Gantt charts, SWOT	
			analysis. 6. Designing and monitoring the	
			project, the organizational chart and the	
			budget with specialized software (MS	
			Project Management, Primavera Project	
			Planner MS Excel)	
			Techniques of Using Artificial Cold	
			Objectives of the discipline: To provide	
			the necessary knowledge regarding the	
			use of artificial cold in industry and other	
			fields (medicine electronics space	
			industry etc.) how to calculate the thermal	
			load of ocoling on onelegure or caving ant	
			the coloulation of a thermal inculation	
			Course contents Theoretical basis of heads	
			course content: I neoretical basis of body	
			cooling. Use of artificial cold in the food	
	4-th Year	1	industry: retrigeration and treezing of	1

foodstu	uffs, speed and freezing time,
calcula	iting the thickness of refrigerated
insulati	ion and condensing check
establi	shing the need for cold lice making.
	of ice generators ice accumulation
by ice	formation Artificial skates: track
structu	re cooling systems cold needs
	cold in construction works: methods
of pre	mixing of concrete components
freezin	a of soil types of wells and their
location	n lise of artificial cold in the
location	in Use of antificial colu in the
Chemic	a industry. Reingerated transport.
	or transport, rail transport, shipping.
Steam	and Gas Turbines
	Joynamic study of steam and gas
turbine	Installations and study of the work
proces	ses carried out in the turbine stage
and of	n the entire turbine. Emphasis is
placed	on the study of energy
transfo	rmations, highlighting the optimal
design	conditions.
Course	e contents:
Overvie	ew of steam and gas turbine
installa	itions. Fields of use. Thermodynamic
study	of steam and gas turbine
installa	tions. Theoretical and real cycles.
Binary	installations with turbines.
Classif	ication and presentation of types of
steam	and gas turbines. Thermodynamic
study	of the flow of compressible fluids
through	n the turbine stage. The energetic
and ga	s-dynamic study of fluid depletion in
nozzles	s. Mobile Energy Energy Study. The
forces	and moments that act on the mobile
blades	. Sizing the turbine step. Twisting
long b	lades. Energy losses in the stairs
and ov	er the entire turbine. Optimization of
4-th Year 1 turbine	stage parameters. Multi-stage 4

			turbines. The distribution of the adiabatic	
			fall on the steps of the steam turbines.	
			Breakdown of the fall	
			Drives for Internal Combustion Engines	
			Objectives of the discipline: The course	
			hours and works carry out a theoretical and	
			experimental study of the thermo-dynamic-	
			mechanical and mechanical processes, in	
			order to optimize them, the mechanical	
			functioning characteristics, study allowing	
			the graduates to handle the design, testing.	
			exploitation of M.A.I. with different	
			destinations.	
			Course contents: Presentation.	
			classification and composition of M.A.I.	
			Power plants with M.A.I. Operation, actual	
			operating patterns and operating regimes	
			of the M.A.I. Ideal Thermodynamic	
			Processes from M.A.I. Ideal cycles of	
			M.A.I. The fluids used for the operation of	
			M.A.I. The gas change processes at M.A.I.	
			The compression process. Formation of	
			fuel mixture and combustion. The process	
			of relaxation. Characteristic parameters of	
			M.A.I. Overcharging M.A.I. Static operating	
			characteristics of M.A.I. Thermal balance	
			sheet of M.A.I. The power plant of M.A.I.	
			Ignition system at M.A.S. The power plant	
	4-th Year	2	at m.c.	3
			Essentials of Experimental Research on	
			Thermal Machines	
			Objective of the discipline: Studying the	
			most modern techniques used in thermal	
			processes in the process of investigating	
			the physical characteristics of a case of	
			some thermal phenomena and developing	
			the skills needed to study an experimental	
	 4-th Year	2	thermal phenomenon.	4

			Course content: Introduction to	
			experimental research techniques. General	
			characteristics of the measurement	
			systems. Measuring displacements and	
			speeds Measurement of pressure and	
			force Methods of measurement applied to	
			flow of fluids. Principles of measuring and	
			controlling temperature Experimental	
			modeling Processing of experimental data	
			Principles of construction use and scope	
			of application of transducers. Operational	
			characteristics of the caps for measuring	
			the mechanical quantities and wave of	
			the mechanical qualities and ways of	
			choosing according to the requirements of	
			the measurement process. Methods and	
			techniques for venification and statistical	
			processing of data collected from an	
			experiment. Lechniques for the realization	
			and planning of experiments. Organization	
			of research activity.	
			Cryogenic Engineering	
			Objectives of the discipline: Provide	
			knowledge on deep-freezing techniques. It	
			has as objective the study of methods of	
			obtaining low temperatures, as well as the	
			study of cryogenic systems for cooling,	
			liquefaction and separation of gaseous	
			mixtures.	
			<b>Course content:</b> Real gas properties.	
			Processes for obtaining low temperatures.	
			Cycles for producing low temperatures.	
			Cryogenic liquefaction systems: the Linde-	
			Hampson system with a lamination, pre-	
			cooled, with two rolls; Claude liquefaction	
			systems (Claude cycle, Kapitza cycle,	
			Heylandt cycle); other liquefaction systems	
			using detents; Liquefaction systems for	
	4-th Year	2	natural gas. Cryogenic Cooling Systems.	4

			Separation of air by cryogenic methods	
			Cryogenic fluid storage and transfer	
			systems	
			Graduation project alphoration	
			Graduation project elaboration	
			Content: Bibliographic documentation.	
			Identify and describe the materials and	
			methods used for the license work.	
			Experimental research on the proposed	
			theme. Visits to medical units, laboratories	
			for the purpose of data collection and	
			harmonization with the theme of the	
			chosen research. Interpretation of results	
			and their reporting to other results from the	
			literature. Modeling / optimization of the	
			technological process. Making a synthetic	
	4-th Year	2	presentation of the results	2
			Renewable Energy	
			Objectives of the discipline: Awareness	
			of the nature and causes of energy crises.	
			Knowledge of renewable energy resources	
			and existing technologies for their	
			exploitation: Developing the capacity to	
			design install and operate different	
			renewable energy systems	
			Course content: Solar energy:	
			Characteristics of solar operative Thermal	
			analysis of solar colloctors: Applications of	
			allarysis of solar collectors, Applications of	
			Biamaga higmaga recourses Detential and	
			Biomass. Diomass resources, Potential and	
			availability, Conversion of biomass into	
			Detential Conture or trace (installation)	
			Potential. Capture systems (installations).	
			Design and execution of wind turbines with	
			norizontal and vertical axis. Uses of wind	
			energy. Hydraulic Energy: The Hydro	
			Power Potential. Types of turbines	
			(impulse, reactive). Technological solutions	
	4-th Year	2	for micro-hydropower plants. Economic,	4

			social and environmental issues.	
			Geothermal Energy: Types of geothermal	
			resources. Exploitation of geothermal	
			resources. Use of geothermal resources.	
			Hydrogen energy.	
			Manufacturing and Operating Thermal	
			Machines	
			Objectives of the discipline: The	
			discipline contributes to the knowledge of	
			the technologies used in the production of	
			the main components of the thermal	
			machines with a strong formative	
			character of the engineer profile of the	
			future engineer in the field of machine	
			building	
			Course contents: Introduction Cotting	
			Started with the Technological Process of	
			Manufacturing Taphnological process of	
			manufacturing. Technological process of	
			manufacturing (technological methods and	
			processes used in the production of semi-	
			inished products, technological processes	
			of chip cutting). Manufacture of piston	
			compressors (machining of carpets, blocks,	
			chutes of various types of piston	
			compressors, cylinder bushings, cylinders	
			and cold-roller compressor cylinders,	
			manufacture of cylinders, crankshafts,	
			pistons and distributor valves for	
			refrigeration compressors). Manufacture of	
			heat exchangers and heat exchangers	
			(general notions for apparatus and	
			containers of thermal installations,	
			materials and semi-finished products used,	
			assembling of heat exchangers and	
	4-th Year	2	containers of thermal installations)	3
			Adjustment and Automatic Control of	
			Heat Machines	
	4-th Year	2	Objectives of the discipline: Study of	4

			automatic systems related to thermal machines, considering the objectives of optimization of some parameters: temperature, pressure, fluid mass flow, cooling power, speed, mechanical power, level of fluids in containers, fuel consumption, thermal flow. Course content: General concepts of automated systems: functions, classification, autonomous regulation systems (SRA). Automation of refrigeration units (IF): automation equipment used in IF (regulators, electroventile, pressure switches, thermostats, rolling valves), adjustment of some parameters of the IF (temperature, pressure, flow, defrosting, deaeration), typical automation schemes. 3. Internal combustion engine control systems (MAI): automatic speed regulators, automatic regulation of cooling and lubrication fluids, automatic fuel viscosity adjustment, automatic regulation of overfill air temperature, automation of MIA auxiliary installations. 4. Adjustment of turbine power systems: turbine power adjustment methods, automatic gas and steam turbine regulation systems, speed, fuel flow, steam generator load.	
	4-th Year	2	Use and Management of Heat Energy Objectives of the discipline: Collection, analysis and interpretation of quantitative and qualitative data and information, from various alternative sources, from professional contexts and literature, for the formulation of concrete arguments, decisions and approaches Course content: Thermal comfort. Thermo- physiological conditions. Relationship	4

		between thermal comfort parameters. Heat	
		demand for heating. Transmitting heat to	
		the outside environment. The room's	
		overall heat check. The annual heat and	
		fuel needs. Optimization of thermal	
		protection. Global optimization of closure	
		solutions. Heating systems. General	
		problems of heating installations.	
		Categories of thermal agents. Features of	
		heating systems. Criteria for choosing	
		heating systems. Scheme for the	
		distribution of heat. The general scheme of	
		the thermal water installation. Hot and hot	
		water distribution schemes. Heating with	
		heaters. Constructive and functional	
		features of heating bodies. Warm air	
		heating. The specificity of the hot air	
		heating system. Ensuring thermal comfort	
		in warm air space. Variants of the hot air	
		heating system.	