



List of courses available for Erasmus incoming students

No.	Name of the course and main chapters	Code from the Study Plan	Field of study	Program of study	Professor (please mention the email address)	Level of study (UG/MSc)	Year of study	Semester (1/2)	No. of ECTS	Support materials for the course (please mention written materials / link address for online materials and also the language of these materials: EN/FR/DE/ES/PT/IT etc)	Individual or group meetings (Please mention Yes or No and the language used during these meetings: EN/FR/DE/ES/PT/IT etc)	Assessment (Please mention the language for the assessment: EN/FR/DE/ES/PT/IT etc)
1	Materials Science and Engineering (Structure of materials; Methods for analyzing the structure of materials; Physico-chemical constitution of materials; Diffusion in materials; Thermodynamics of material systems; Balance charts; Solidification of metallic materials)	MTC.103.DI.DD	Automotive Engineering/ Mechanical Engineering/ Mechatronics and Robotics	All study programs	Prof.dr.eng. Corneliu Munteanu cornelmun@gmail.com corneliu.munteanu@academic.tulsi.ro	UG	1	1	4	Different materials containing the taught material, in physical format + practical works in electronic format EN	Yes EN	EN
2	Computer Programming and Programming Languages (Data structures, Computational environment, Programming and mathematical software, Vectors and matrices, Polynomials and interpolation, Symbolic and numerical calculus in Matlab, Logical and relational operators, Special functions, Numerical integration, Solution of linear algebraic equations, Eigenvalues and eigenvectors of a matrix. Solving non-linear equations and systems of non-linear equations, Graphics in Matlab, Programming in C/C++)	MTC.106.DI.DF	Automotive Engineering/ Mechanical Engineering/ Mechatronics and Robotics	All study programs	Popescu Gabriel gabriel.popescu@academic.tulsi.ro	UG	1	1	6	Written materials EN	Yes EN	EN
3	Applied Thermodynamics 1 (Introduction, Energy and First Law of Thermodynamics, Properties and Gas Laws, Second Law Analysis)	MTC.110.DI.DD	Mechanical Engineering	Mechanical	Aristotel Popescu	UG	1	2	5	Written textbook	Yes	EN
	Chemistry "Introductory notions (atoms and molecules; chemical bonds; substances and mixtures of substances; laws of chemistry); Chemical thermodynamics; Chemical kinetics; Chemical equilibrium; Electrochemistry; Corrosion and corrosion protection; Chemistry of lubricants; Fuels; Water: industrial water and wastewater; Macromolecular compounds applied in the technics"	MTC.111.DI.DF	Mechanical Engineering	All study programs	Professor PhD chem. habil. Margareta Gabriela CIOBANU ciobanu03@yahoo.co.uk ; margareta-gabriela.ciobanu@academic.tulsi.ro	UG	1	2	3	Written materials EN	Yes EN	EN
5	Strength of Materials 1 (C1: Introduction; C2: Materials testing, Mechanical and elastic characteristics; C3: Materials testing, influencing factors. Simplifying assumptions in SM; C4: Energy theorems and methods; C5, C6: Axial stresses, statically determined problems; C7: Axial stresses, heavy weight bars, equal strength solid. Axial stresses, statically indeterminate problems, lifting indeterminacy by geometric methods; C8: Axial stresses, statically indeterminate problems; C9: Lifting indeterminacy by geometric methods and energy methods; C10: Axial stresses, statically indeterminate problems, lifting indeterminacy by FEM; C11: Conventional shear design, joint design, C12: Torsional stress, statically determined problems; C13: Torsional stress, statically indeterminate problems; C14: Bending stress, calculation of stresses and strains; C15: Bending, equal strength solid, rational sections, longitudinal slip; C16: Bending, statically determined problems; C17: Bending, statically determined problems; C18: Bending, statically indeterminate problems; C19, C20: Longitudinal buckling; C21, C22: Calculation of lattice beams; C23, C24: Fundamentals of variable stress design (fatigue); C25, C26: Elements of elasticity theories (TE); General state of stresses. Tensile stresses and strains. Variation of stresses around a point; Principal stresses and strains, principal directions; Mohr's circles for plane and spatial state of stresses; C27, C28: Fundamental equations of TE. Deformation potential energy (3D); Relationship between elastic characteristics (E, G and ν); Tensor rosette; Limit state theories)	MTC.202.DI.DD	Mechanical Engineering	All study programs	Prof.dr.eng. Viorel Goanta viorel.goanta@academic.tulsi.ro	UG	2	1	7	Written materials EN	Yes EN	EN
6	Applied Thermodynamics 2 (Power Cycles -vapor and gas-, Refrigeration Cycles, Heat Pumps, Introduction in Heat Transfer)	MTC.204.DI.DD	Mechanical Engineering	Mechanical Engineering	Aristotel Popescu aristotel.popescu@academic.tulsi.ro	UG	2	1	6	Written textbook Written Lab Instruction book PDF documents EN	Yes EN	EN
7	Strength of Materials 2 / Main chapters: Failure theories (Rankine, Tresca, von Mises, Mohr-Coulomb etc.); Multiaxial loading; Calculus for compound state of stress: unsymmetric bending, eccentric axial loads, circular shafts etc.; Torsion of noncircular members and shafts; Frames; Curved bars; Hyperstatic systems; Thin-walled vessels; Thick-walled tubes; Spinning disks; Design for impact loads	MTC.208.DI.DD	Mechanical Engineering	Mechanical engineering	Assoc. Prof. Marian-Anisor Mares (e-mail: marian-anisor.mares@academic.tulsi.ro)	UG	2	2	4	Ferdinand Berr et. al., Mechanics of materials, https://docs.google.com/file/d/0B5-	Yes, EN/FR/IT	EN/FR/IT
8	Mechanisms (This course introduces the principles of designing mechanisms. Students will investigate the kinematics and dynamics of machinery. Topics include fundamentals of linkage kinematics and design, gear kinematic analysis, cam mechanisms analysis, and integrating common mechanisms for a machinery group project.)	MTC.203.DI.DD	Mechanical Engineering	All study programs	Prof. Ioan Doroftei (ioan.doroftei@academic.tulsi.ro)	UG	2	1	7	Written materials EN	Yes EN/FR	EN/FR
9	Machine Elements 1 (Design methodology; General Design Criteria; Safety at static loads; Variable load safety; Threaded Joints; Transmissions (belts, chains and gears))	MTC.209.DI.DD	Mechanical Engineering, Automotive Engineering, Mechatronics and Robotics	All study programs	Assoc. Prof. Cristel Știrbu (e-mail: cristel.stirbu@academic.tulsi.ro)	UG	2	2	6	Written materials EN	YES EN	EN
10	Mechanical Vibrations (Harmonic and periodic motion; theory of free and forced vibrations in linear elastic systems with one or more degrees of freedom; theoretical models for the study of longitudinal vibration, torsional and transverse straight bars; free vibration, damped and undamped; harmonically excited vibration; transient responses; vibration damping, isolation and absorption elementary energy methods; multi-degree of freedom systems; usual approximate methods (Rayleigh, Ritz) for vi study; getting started in the study of nonlinear vibration, random vibration, shocks; noise; characteristics and noise-vibration correlation; sources of vibration and noise from machinery; solving specific vibration design problems)	MTC.212.DI.DD	Mechanical Engineering, Automotive Engineering, Mechatronics and Robotics	All study programs of faculty	Carmen Bujoreanu carmen.bujoreanu@academic.tulsi.ro	UG	2	2	4	Written materials EN	Yes EN	EN
11	Fundamentals of Systems Theory (Automation): Automated system concept; standard signals; computation techniques in time domain (pulses train, convolution); computation techniques based on Laplace transform, on frequency method, on sampling theorem; transfer function; systems operating regimes; analysis of the systems quality; stability analysis fundamentals (Routh-Hurwitz, Nyquist); mechatronic system structure; practical experience with LabVIEW in transfer functions, the close loop stability analysis based on Nyquist criterion, the frequency and time response analysis of automated/mechatronics systems.	MTC.305.DI.DD	Mechanical engineering, Mechatronics and Robotics	Mechanical Engineering/ Mechatronics/ Robotics	Carmen Bujoreanu , carmen.bujoreanu@academic.tulsi.ro	UG	3	1	4	Written materials EN	Yes EN	EN
12	Renewable Energy (fundamentals, solar, wind , hydro and marine, geothermal, biomass)	IM.331.DI.DS	Mechanical	Thermal	Aristotel Popescu, aristotel.popescu@academic.tulsi.ro	UG	3	1	2	Written textbook	Yes	EN
13	Machine Elements 2 (Axes and shafts; Connections between hubs and shafts; Sliding bearings; Rolling Bearings;	MTC.301.DI.DD	Mechanical	Mechanical	Assoc. Prof. Cristel Știrbu (e-mail: cristel.stirbu@academic.tulsi.ro)	UG	3	1	7	Written textbook	Yes EN	EN
14	Finite Element Method, FEM (I Introductory elements. II Basics of Deformable body mechanics used in FEA: Elasticity, Plasticity, Nonlinearity. III Basics of FEA. Evaluation of strains and stresses)	MTC.302.DI.DD	Mechanical Engineering	Mechanical Engineering	assoc.prof.dr.eng. Mihail AIGNATOAEI email: mihail.aignatoaei@academic.tulsi.ro	UG	3	1	3	Written materials EN	No	EN
15	The basics of robotics (Introduction; Manipulator mechanical structure; Coordinate transformations; Forward and inverse kinematics; Manipulator statics and dynamics; Trajectory planning)	MCT.307.DI.DD	Mechatronics and robotics	Mechatronics, Robotics	Prof. Ioan Doroftei (ioan.doroftei@academic.tulsi.ro)	UG	3	2	5	Written materials EN	Yes EN/FR	EN/FR
16	Electrical Engineering (DC circuits, Magnetic circuits, AC circuits. The elements of the circuits in permanent sinusoidal regime. Powers in alternating current circuits Three-phase electrical circuits, Electric transformers, Asynchronous electric machines, DC electric machines)	MTC.303.DI.DD	Mechanical Engineering	Thermal Systems and Equipment	George Andrei Ursan, george-andrei.ursan@academic.tulsi.ro	UG	3	1	3	Written materials EN	YES	EN
17	Heat Transfer (Introduction, Energy balance in thermal systems, 1D, 2D conduction in steady-state and transient, Numerical solution methods, Heat, impulse and mass transfer	SET.309.DI.DS	Mechanical Engineering	Mechanical	Aristotel Popescu, aristotel.popescu@academic.tulsi.ro	UG	3	2	5	Written textbook	Yes	EN
18	Biomechanics (Basics of biomechanics of the human locomotor system: general biomechanics and systemic biomechanics)	RBT.309.DI.DS	Mechatronics	Robotics	Emil Budescu, emil.budescu@academic.tulsi.ro	UG	3	2	4	Written materials	YES EN/FR	EN/FR
19	Compressors (volumetric reciprocating compressors volumetric rotary compressors, dynamic radial and axial compressors)	SET.310.DI.DS	Mechanical Engineering	Thermal systems and equipments	associate professor Viad Mario Homtescu viad-mario.homtescu@academic.tulsi.ro	UG	3	2	5	Written materials EN/IT	Yes EN	EN

20	Design and computation of automotive transmissions (Main chapters: manual gearboxes, clutches, torque converters, synchronizers, hybrid and electrical vehicle transmissions)	CA.312.DI.DS	Automotive engineering	Automotive manufacturing	Viorel Paleu, vpaleu@tuiasi.ro	UG	3	2	6	Written materials / EN: Lechner G., Naurheimer H., Automotive transmissions - fundamentals, design and applications, http://www.volkswagen-technik/manuals/ecatalogs/02/automotive/transmissions_fundamentalsselection.pdf; Tom Denton - Electrical and Hybrid Vehicles : https://issuu.com/zusikuti27616/docs/1138842370-electric_and_hybrid_vehicles_by_tom_denton	Yes EN /FR	EN /FR
21	Turbomachinery - radial and axial compressors, steam and gas turbines	IM.410.DO.DS-1	Mechanical Engineering	Mechanical Engineering	associate professor Vlad Mario Homutescu vlad-mario.homutescu@academic.tuiasi.ro	UG	4	2	6	Written materials EN/IT	Yes EN	EN
22	Data Acquisition Systems and Interfaces (Main chapters: Signals; Statistical processing of signals; Mathematical transformations applied to signals; Data acquisition; Sampling signals; Dithering signals; The phenomenon of aliasing; Correlation function, autocorrelation amplitude-frequency spectra, power spectra; Types of filters and filtering signals)	MCT.401.DI.DD.	Mechatronics and Robotics/ Mechanical Engineering	Mechatronics/ Robotics/ Mechanical Engineering	Viorel Paleu, viorel.paleu@academic.tuiasi.ro	UG	4	1	3	Written materials / EN: Smith S.W., http://www.dsppguide.com/pdfbook.htm	Yes EN /FR	EN /FR
23	Refrigeration Machines (Refrigeration machines, refrigeration system, refrigerants, mechanical / absorption / jet refrigeration, thermoelectric effect)	SET.401.DI.DS	Mechanical Engineering	Thermal Engineering	Mihai Marius Prodan mihai-marius.prodan@tuiasi.ro	UG	4	1	7	PDF Documents EN	Yes EN/FR/ES	EN/FR/ES
24	Mobile robotics (This course will introduce the basic principles of mobile robotics history, theory, hardware and control. Topics will include robot components, effectors and actuators, locomotion, sensors, feedback control, control)	RBT.402.DI.DS	Mechatronics and Robotics	Robotics	Prof. Ioan Doroftei (ioan.doroftei@academic.tuiasi.ro)	UG	4	2	6	Written materials EN	Yes EN/FR	EN/FR
25	Internal Combustion Engines Construction and Calculus Presentation of the theoretical bases of operation, as well as the real processes that take place in the internal combustion engines. Constructive and functional aspects of the engine elements, fuel system, gas distribution system, lubrication and cooling system.	AR.403.DI.DS	Automotive Engineering	Vehicle Engineering	Lidia Gaiginschi; lidia.gaiginschi@academic.tuiasi.ro	UG	4	1	6	Written materials EN	Yes EN	EN
26	Manufacturing Technologies in Automotive Industries (Industrial processes, Production process, Technological process, Construction technology, Surface condition, Processing of external cylindrical surfaces, Processing of inner cylindrical surfaces, Planing of flat surfaces, Thread processing technology, Milling of gears, Stamping and punching, Special processing technologies, Welding technologies, Rapid prototyping, Injection of plastics)	MTC.410.DI.DS	Mechanical Engineering	Automotive Manufacturing	Assoc.Prof. Ciprian CIOFU; ciprian-dumitru.ciofu@academic.tuiasi.ro	UG	4	2	5	Written materials EN	Yes EN	EN
27	Artificial Cooling (Air conditioning principles and systems; Renewable energies for air conditioning and refrigeration; Refrigeration and freezing in food industry; Refrigeration load for cold storage rooms; Transportation of refrigerated foods; Ice making; Ice skating rinks; Artificial ground freezing; Concrete cooling; Artificial cooling in chemical industry)	SET.413.DO.DS-1	Mechanical Engineering	Thermal Systems and Equipment	Marius Vasile Atanasiu marius-vasile.atanasiu@academic.tuiasi.ro	UG	4	2	3	PDF Documents EN	Yes EN	EN/FR/ES
28	Automotives testing The course contains the classification and preparation of road vehicle tests, the vehicle's installation tests, general test for the entire vehicle, safety tests.	AR.408.DI.DS	Automotive Engineering	Vehicle Engineering	Lidia Gaiginschi; lidia.gaiginschi@academic.tuiasi.ro	UG	4	2	7	Written materials EN	Yes EN	EN
29	Biomimetics (Introduction; Basics in micro- and nano-tribology; Friction and adhesion in biological systems; Micro- and nanoscale test equipment; Electroactive polymers as artificial muscle; Biological inspired robots; Biomimetic hand; Robotic arm; Human skin; Bioinspired smart skin; Tribology of human joints; Biological inspired sensors)	MA.IA.104.DS	Mechatronics and Robotics	Advanced Mechatronics	Vlad Cărlescu vlad.carlescu@tuiasi.ro	MSc	1	1	5	Written materials EN	Yes EN	EN
30	Vibroacoustic diagnosis or Vibroacoustic analysis of automotive systems (Main chapters: Vibroacoustic signals; Time analysis; Frequency analysis; Time-frequency analysis; Rolling bearings diagnosis; Gears diagnosis; Electrical motors diagnosis)	DETIM.IA.109; MA.IA.109; CMA.IA.108	Mechanical Engineering/ Mechatronics and Robotics/ Automotive Engineering	Diagnosis and Technical Expertise in Mechanical Engineering/ Advanced Mechatronics/ Concept and Management of Automotive Design	Viorel Paleu, vpaleu@tuiasi.ro	MSc	1	1	3	Written materials / EN: http://www.cementechology.it/Library/Vibration_Diagnostic_Guide.pdf, http://jmiie.hu.edu/jo/files/v3n4/5.pdf	Yes EN /FR	EN /FR
31	Experimental Data Processing: Basic principles of data acquisition and processing; data acquisition boards; signal conversion principles; analogue/digital and digital/analog converters; sensors and transducers; signal conditioning (analyzers, filters, amplifiers, integrators, differentiating); acquisition and distance data transmission; programming languages for data acquisition and processing (LabVIEW soft).	IA.102	Mechanical Engineering, Automotive Engineering, Mechatronics and Robotics	Diagnosis and Technical Expertise in Mechanical Engineering/ Thermal Machines, Refrigeration and HVAC/ Advanced Mechatronics	Carmen Bujoreanu, cbujorea@tuiasi.ro	MSc	1	1	4	Written materials EN	Yes EN	EN
32	Correlated Performances of Road Traffic Participants (Transmission of knowledge on vehicle drivers reaction, depending on various factors driving, errors that may occur, and correlating performance drivers of vehicles and other road users)	SPCR.IA.103	Automotive Engineering	Road Safety Traffic and Performances	Lidia Gaiginschi; lidia.gaiginschi@academic.tuiasi.ro	MSc	1	1	6	Written materials EN	Yes EN	EN
33	Road Accidents Study (Transmission of knowledge on accidentological researches, acquisition and interpretation of traces from road accidents, processing data)	SPCR.IA.101	Automotive Engineering	Road Safety Traffic and Performances	Lidia Gaiginschi; lidia.gaiginschi@academic.tuiasi.ro	MSc	1	1	6	Written materials EN	Yes EN	EN
34	Fracture mechanics (The actual behavior of the materials and the notion of defect; Mechanisms of brittle and ductile rupture nucleation; Statistical representations, dispersion of characteristics for defective materials; Micro-fissures in materials and their propagation conditions; Calculation of Resistance based on the concepts of Fracture mechanics; Criteria for fissure propagation, breaking, Fracture toughness; Study of static and dynamic fracture mechanisms in materials and structures; Establishing the fracture toughness criteria for a more precise definition of resistance to different loadings)	DETIM.IA.103	Mechanical Engineering	Diagnostics and technical expertise in Mechanical Engineering	Viorel Goantă, viorel.goanta@academic.tuiasi.ro	MSc	1	1	6	Written materials EN	Yes EN	EN
35	Risk analysis and expertise in Mechanical Engineering (Terminology practice expertise: method, approach, instrument; Diagnostic tools and evaluation approach; Sources of risk, In-Service Inspection; Probabilistic models for risk assessment; Methods for determination of defects; Analytical models to detect and locate faults; Analysis of systems with faulty actuators; Maintenance system based on the diagnosis)	DETIM.IA.107	Mechanical Engineering	Diagnostics and technical expertise in Mechanical Engineering	Viorel Goantă, viorel.goanta@academic.tuiasi.ro	MSc	1	2	5	Written materials EN	Yes EN	EN
36	Technical Regulations and Approval of Automotive and Components (European rules into effect concerning the approval of road vehicles and their components; Romanian and European legislation concerning the approval; technical standards that must meet each subset separately, and the vehicle as a whole, to be homologated)	CMA.IA.109	Automotive Engineering	Concept and Management of Automotive Design	Lidia Gaiginschi; lidia.gaiginschi@academic.tuiasi.ro	MSc	1	2	4	Written materials EN	Yes EN	EN
37	Technical Standards for Road Traffic Safety (Technical performances and maintenance conditions in Romania; Checking the technical condition of vehicles; Methods and means of diagnosing vehicles)	SPCR.IA.108	Automotive Engineering	Road Safety Traffic and Performances	Lidia Gaiginschi; lidia.gaiginschi@academic.tuiasi.ro	MSc	1	2	5	Written materials EN	Yes EN	EN
38	Engineering ethics and integrity	MTFC.IA.109	Mechanical Engineering	Mechanical Engineering	Aristotel Popescu	MSc	1	2	2	EN, PPT	Yes	EN
40	Unconventional Thermal Machines (Stirling engine, Ericsson engine, Vuilleumier machine)	MTFC.IA.204	Mechanical Engineering	Thermal Machines, Refrigeration, and HVAC	associate professor Vlad Mario Homutescu vlad-mario.homutescu@academic.tuiasi.ro	Msc	2	1	5	Written materials - EN	No	EN
39	Transfer processes, modelling and simulation: Transfer coefficients, engineering correlations, Mathematical formulation, Engineering numerical methods, numerical methods for	SET.309.DI.DIS	Mechanical Engineering	Thermal Engineering	Aristotel Popescu	MSc	1	2	5	EN, PPT	Yes	EN
41	Alternative Energy Sources for Sustainable Development (Renewable energy and climate change, technologies and markets, Integration into present and future energy systems,	MTFC.IA.201	Mechanical Engineering	Thermal Engineering	Aristotel Popescu	MSc	2	1	4	PDF documents EN	Yes	EN

42	Modern systems for railway transport (Main chapters: modeling of high-speed trains; the bogie; gearbox; motor; double cardan transmission; sustainability electric motor bearings; the influence of the complexity of railway routes on the maximum speed of train and its transmissions)	STCF.IA.202	Mechanical Engineering.	Railway transport systems	Viorel Paleu, vpaleu@tuiasi.ro	MSc	2	1	5	Written materials / FR: V. Paleu, Calcul des transmissions ferroviaires, Editura Tehnopress, Iasi, 2020, ISBN 978-606-687-427-4, pp. 183	Yes EN /FR	EN /FR
43	Road Traffic Safety Management (Road traffic safety, evolution and perspectives; Institutional organization of road safety; Visions on road safety; Road safety strategies; Increasing road safety through the construction, reconstruction and design of road infrastructure; Improving road safety by designing safer vehicles; Improving road safety through education and road education campaigns; Improving road safety through measures to enforce road legislation; Determining, updating and improving the use of social costs of road accidents)	SPCR.IA.203	Automotive Engineering	Road Safety Traffic and Performances	Lidia Gaiginschi, lidia.gaiginschi@academic.tuiasi.ro	MSc	2	1	5	Written materials EN	Yes EN	EN
44	Advanced FEA (Finite element analysis), AFEA : I. Theoretical basis concerning the use of FEA in Mechanical Engineering. II. Non-linear FEA. III. Python programming language. Internet resources and E-learning in the FEA-CAE field. The Concepts: CFD, „Multiphysics”, MES, „Mechanical Event Simulation”. Structural optimization by use of FEA.	DETIM.IA.208-1	Mechanical Engineering	Mechanical Engineering	assoc.prof.dr.eng. Mihail AIGNATOAE email: mihail.aignatoae@academic.tuiasi.ro	MSc	2	1	5	Written materials EN	No	EN
45	Project Management (Generalities of Project Management, Organization management by projects, Project Management specific processes.	MA.IA.106, SR.IA.	Mechatronics	Advanced	Florentin Bulum, fbulum@gmail.com	MSc	1	2	3	1.International	YES EN	EN
	Dean of the Faculty prof. Gelu Ianuș											
										Erasmus+ Faculty Coordinator		
										prof. Carmen Ema Panaite		