

## Field of study: Road vehicles Engineering Programme of studies: Road Vehicles

### First Year of study:

**Subject of study: Mathematical Analysis, Code: D22ARL101**

**NUMBER OF CREDITS:** 5

**YEAR/SEMESTER:** 1<sup>st</sup> year / 1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course offers the students theoretical and practical concepts of the Mathematical Analysis.

**CONTENT:** Convergence: Sequences and series of real numbers, Power series, Fourier series. Continuity and Differentiability: Functions of several real variables, Implicit functions, The extreme values of a real function of several variables. Integral calculus: Definite integrals with parameters, Improper integrals, Line integrals of the first type, Multiple integrals, First type surface integrals. Elements of field theory.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Diamandescu, Aurel - Analiză Matematică, Vol. I, II, Editura Universitaria, Craiova, 2005

Diamandescu, Aurel – Îndrumar de Analiză Matematică, Editura Universitaria, Craiova, 2006

Diamandescu, Aurel – Culegere de Probleme de Analiză Matematică, Editura Universitaria, Craiova, 2007

Diamandescu, Aurel – Matematici Generale, Editura Universitaria, Craiova, 2009

Predoi Maria, Bălan Trandafir – Mathematical Analysis, Vol. I, II, Editura Universitaria, Craiova, 2005

**Subject of study: Descriptive geometry, Code D22ARL102**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 1<sup>st</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The main aim of the course is to prepare students regard to acquiring the basic theoretical and practical concepts from descriptive geometry, to develop the creative skills to see „deep in space” and to prepare project designs. Terms used are under current standards and international standards.

**CONTENT:**

Projection systems. Line. A line of positions in relation to the planes of projection. The relative positions of two lines. The Plan. Line of a plan. The relative positions of the two planes. The position of a line in a plane. The intersection of plane figures. The projection transformation methods: the method of changing the projection planes, crop rotation method and rotation method of projection planes. Representation of geometric bodies. Sections in geometrical bodies. Development of geometric surfaces. Intersection of geometric bodies. The general method for the determination of the line of intersection

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Buțu, A.; Sass, L.- Grafică inginerescă. Vol. I. Geometrie descriptivă. Lucrări de laborator, Editura SITECH, Craiova, 1999;

Buțu, A.; Sass, L.- Grafică inginerescă. Geometrie descriptivă. Teste grilă, Editura Universitaria Craiova, 1999;

Ene, Al.I.; Buțu, A.; Neagoe, D.; Stănescu, G.- Geometrie descriptivă, vol. I și II, Editura SITECH, Craiova, 1998;

Enache, I.; Ivănescu, T.; Buzilă, V. - Geometrie descriptivă și desen tehnic. Probleme și aplicații, Editura didactică și pedagogică, București, 1982;

Noveanu, L.; Orban, M. - Geometrie descriptivă, Universitatea Tehnică din Cluj-Napoca, 1992;

Precupețu, P.; Dale, C.- Probleme de geometrie descriptivă cu aplicații în tehnică, Editura Tehnică, București, 1987;

Moncea, J.-Geometrie descriptivă și desen tehnic, Editura didactică și pedagogică, București, 1982;

Tănăsescu, A. -Probleme de geometrie descriptivă, Editura didactică și pedagogică, București, 1962;

**Subject of study: Technical chemistry (Code D22ARL103)**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 1<sup>st</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Study of materials, code: D22ARL104**

**NUMBER OF CREDITS:** 5

**YEAR/SEMESTER:** 1<sup>st</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** Study of materials course offers the students basic knowledge about the internal structure and properties of ferrous and nonferrous alloys materials . It is an essential technical discipline needed to further understanding the technology of materials and thermal treatment.

**CONTENT:** Crystal structures and properties of metals. Solidification and plastic deformation of metals. Binary alloy systems. Structures and properties of ferrous alloys plain carbon steels. Iron-carbon phase diagram. Plain carbon steels . Cast iron. Basic concepts of thermal treatment of carbon steels. Carbon steels transformation under heating and cooling. Austenite transformation under cooling. Martensite transformation. Isothermal and continuous- cooling transformation diagrams of carbon steels. Thermal treatments : annealings , normalizing , quenching, tempering. Aluminium alloys and copper alloys.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Colan, N., Studiul metalelor, EDP, București, 1983.

Rădulescu, Maria, Studiul metalelor, EDP, București, 1982.

Trușculescu, M., Studiul metalelor, EDP, București, 1977

Tărăță, Daniela, Studiul materialelor, Edit.SITECH Craiova, 2008

Baciu ,Constantin; Alexandru, Ioan; Popovici, Radu; Baciu, Maria; Știința materialelor metalice, Editura Didactică și Pedagogică, R.A.București, 1996.

Sontea S., Tarata D.,

Tratamente termice si termochimice, Edit. Spirit Romanesc, Craiova 2001

Dulămiță ,T.- Tehnologia tratamentelor termice, EDP, București, 1983

**SUBJECT: Mechanics I (Code:D22ITTL103)+ Mechanics II (Code:D22ITTL211),**

**NUMBER OF CREDITS:** 5-1<sup>st</sup> sem., 6-2<sup>nd</sup> sem.

**YEAR/SEMESTER:** 1<sup>st</sup> year/1<sup>st</sup> sem.+2<sup>nd</sup> sem.

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course presents to students the fundamental notions of analytical mechanics and specific notions of kinematics; kinematical analysis of rigid body in particular motions and, generally, in general motion.

**CONTENT:**

Reduction of the sliding vectors.

Mass, the centre of mass (definitions, properties, Guldin-Pappus Theorems).

Moments of inertia.

Kinematics of material point.

Kinematics of rigid body.

Kinematics of relative motion for material point.

Kinematics of relative motion for solid body.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Bogdan, M.L. ș.a., Mecanica tehnică - culegere de probleme, Editura " Sitech", 1997, ISBN 973-97524-8-8;

Bogdan, M.L., Bogdan, C., Mecanica. Cinematica și Statica, Editura "Sitech", 2004, ISBN 973-657-558-6;

Bogdan, M.L., Bogdan, C., Mecanică. Culegere de probleme, Editura "Universitaria", 2005, ISBN 973-742-018-7;

Bogdan, M.L., Bogdan, C., Mecanica. Dinamică și Vibrații mecanice, Editura "Universitaria", 2006, ISBN 973-742- 329-1, ISBN978-973-742-329-0;

Rădoi, M., Deciu, E., Mecanica, Editura Didactică și Pedagogică, București, 1981.

Buculei, M., Mecanica, vol. I, II, Reprografia Universității din Craiova, 1980.

Constantinescu, I., Bolog, C., Mecanică, Editura Didactică și Pedagogică, București, 1978.

Iacob, C., Mecanică teoretică, Editura Didactică și Pedagogică, București, 1971.

Irimiciuc, N., Mecanica, Editura Didactică și Pedagogică, București, 1971.

Voinea, R., Voiculescu, D., Ceaușu, V., Mecanica, Editura Didactică și Pedagogică, București

**Subject of study: Physical education I (Sport) (Code D22ARL107)**

**NUMBER OF CREDITS:** "1"

**YEAR/SEMESTER:** 1<sup>st</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** -

**Subject of study: Foreign language (English, Francaise, Deutsch I (Code D22ARL108)**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 1<sup>st</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Optional

**TEACHING LANGUAGE:** -

**EVALUATION:** Written/oral examination

**Subject of study: Computer programming and programming languages I (Code D22ARL106) + II (D22ARL210),**

**NUMBER OF CREDITS:** 4 + 4

**YEAR/SEMESTER:** 1<sup>st</sup> year / 1<sup>st</sup> + 2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** To develop at students basic skills in the use of Windows operating systems, to familiarize students with development of fundamental algorithms and programming theory; learn students with programming in "C" language and development of Windows applications.

**CONTENT:** Architecture of a computer system, internal representation of information; Numeration bases, logic functions, elements of algorithms, Introduction to C language vocabulary - operators; Instructions and statements of C language, expressions, functions, I / O operations Elementary; Pointers and arrays, structures and unions in C, use of strings, dynamic memory allocation, library functions, simple chain lists, double chain lists, recursion, files in C, solving systems of linear equations structure Windows applications , Programming mouse related events, GDI functions; Use of type menu and dialog box in Windows.,

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**BIBLIOGRAPHY (selective):**

Knuth D.E. , Treaty of computer programming. fundamental algorithms, Ed. Tehnica, 1973

Burdescu, D., - Algorithms and data structures, Ed. Mirton, Timișoara, 1992

Petrovici, V., - Programming in C language, Ed. Tehnică 1993, București

Kernighan B., Ritchie D. , The C Programming Language, Prentice Hall, 1988

Pădeanu, L., O., Windiws programming in C language, Reprografia Univ. din Craiova, 1993

Petzold Charles, Programming Windows, 6th edition, Microsoft Press, 2012

**Subject of study: Algebra, analytic and differential geometry (Code D22ARL211)**

**NUMBER OF CREDITS:** 5

**YEAR/SEMESTER:** 1<sup>st</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Technical drawing and Info-graphics (Code D22ARL212)**

**NUMBER OF CREDITS:** 5

**YEAR/SEMESTER:** 1<sup>st</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course offers to the students theoretical and practical concepts about the drawing of the technical documentation for manufacturing, assembling and repairing operations. Also, the course offers the basics for the graphical representation and correct reading of the technical ideas necessary for each engineer.

**CONTENT:** The objectives of the course, projecting na drawing systems. The general rules for the correct drawing of the views and sections. The dimension operation in Technical drawing, dimension rules representation, dimension systems, scaled drawing. The drawing, notation and dimension operations for the threads. The material code notation. The roughness of the surfaces notation. Assembly drawing, the drawing rules, the bill of materials. The gears drawing operation.

General aspects about Computer Graphics. The evolution of Computer Graphics. A short history of the CAD (Computer Aided Design) concept. The classification of the CAD systems. The location of the CAD concept in the industrial company. New concepts in CAD. The concepts and software adjacent to the CAD concept. The CAM (Computer Aided Machining) concept. The FEA (Finite Element Analysis) concept. The dynamic and kinematic simulation software. Parameterization and bidirectionality. Modeling software modules. 2D sketches. Base and additional shapes. Reference geometrical elements. Complex shapes. Curves, surfaces. Assembly software module. Conections, geometrical constraints, equations, mechanical constraints. Software modules for the technical documentation. The 2D drawings. Elements of virtual testing. Animation and realist views.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Ene, A.I. Desen tehnic industrial Ed. Avrameanca, Craiova 1993;

Enache, I., Ivanescu, T., Buzila, V. Geometrie descriptiva si desen tehnic-probleme si aplicatii, Ed. Didactica si Pedagogica, Bucuresti 1982;

Gherghina, G. s.a. Grafica tehnica - II- Desen tehnic, Ed. Egnatia, Craiova 1996;

Husein, Gh., Saveanu, I. Desen tehnic, Ed. Didactica si pedagogica, Bucuresti 1976;

Gherghina, G. s.a. Notiuni de grafica tehnica - II- Desen tehnic, Reprografia Universitatii din Craiova 2000.

Gherghina G., Popa D., Tudor M - Notiuni generale de desen tehnic industrial, Ed. Sitech, Craiova 2002, 2004.

Nour I Crisan Notiuni fundamentale in desenul tehnic industrial, Ed. Risoprint, Cluj Napoca, 2001

Popa D., Gherghina G., Infografica, Ed. Sitech, ISBN 978-606-530-028-6, pp. 308, Craiova 2008;

\*\*\* National and international standards archive

**EVALUATION:** Written/oral examination

**Subject of study: Physical education II (Sport) (Code D22ARL214)**

**NUMBER OF CREDITS:** "1"

**YEAR/SEMESTER:** 1<sup>st</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** -

**Subject of study: History of technics (Code D22ARL215)**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 1<sup>st</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Foreign language (English, Francaise, Deutsch II (Code D22ARL218)**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 1<sup>st</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** optional

**TEACHING LANGUAGE:** -

**EVALUATION:** Written/oral examination

**Subject of study: Numerical applications in engineering (Matlab, Simulink, Mathcad) (Code D22ARL213)**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 1<sup>st</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

## Second Year of study:

**Subject of study: Technical drawing and Info-graphics, Code:D22ARL322**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 2<sup>nd</sup> year/1st semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course offers to the students theoretical and practical concepts about the drawing of the technical documentation for manufacturing, assembling and repairing operations. Also, the course offers the basics for the graphical representation and correct reading of the technical ideas necessary for each engineer.

**CONTENT:** The objectives of the course, projecting and drawing systems. The general rules for the correct drawing of the views and sections. The dimension operation in Technical drawing, dimension rules representation, dimension systems, scaled drawing. The drawing, notation and dimension operations for the threads. The material code notation. The roughness of the surfaces notation. Assembly drawing, the drawing rules, the bill of materials. The gears drawing operation.

General aspects about Computer Graphics. The evolution of Computer Graphics. A short history of the CAD (Computer Aided Design) concept. The classification of the CAD systems. The location of the CAD concept in the industrial company. New concepts in CAD. The concepts and software adjacent to the CAD concept. The CAM (Computer Aided Machining) concept. The FEA (Finite Element Analysis) concept. The dynamic and kinematic simulation software. Parameterization and bidirectionality. Modeling software modules. 2D sketches. Base and additional shapes. Reference geometrical elements. Complex shapes. Curves, surfaces. Assembly software module. Connections, geometrical constraints, equations, mechanical constraints. Software modules for the technical documentation. The 2D drawings. Elements of virtual testing. Animation and realist views.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Ene, A.I. Desen tehnic industrial Ed. Avrameanca, Craiova 1993;

Enache, I., Ivanescu, T., Buzila, V. Geometrie descriptiva si desen tehnic-probleme si aplicatii, Ed. Didactica si Pedagogica, Bucuresti 1982;

Gherghina, G. s.a. Grafica tehnica - II- Desen tehnic, Ed. Egnatia, Craiova 1996;

Husein, Gh., Saveanu, I. Desen tehnic, Ed. Didactica si pedagogica, Bucuresti 1976;

Gherghina, G. s.a. Notiuni de grafica tehnica - II- Desen tehnic, Reprografia Universitatii din Craiova 2000.

Gherghina G., Popa D., Tudor M - Notiuni generale de desen tehnic industrial, Ed.Sitech, Craiova 2002,2004.

Nour I Crisan Notiuni fundamentale in desenul tehnic industrial, Ed. Risoprint, Cluj Napoca, 2001

Popa D., Gherghina G., Infografica, Ed. Sitech, ISBN 978-606-530-028-6, pp. 308, Craiova 2008;

\*\*\* National and international standards archive.

**Subject of study: Special mathematics, Code: D22ARL321**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 2<sup>nd</sup> year/1st semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Mechanical vibrations, Code D22ARL323**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course offers the students theoretical and practical concepts regarding the modelling process of vibrating mechanical systems, both discrete and continuous as well as different methods both analytical and numerical for solving these models.

**CONTENT:** General considerations, Elements for modeling the mechanical systems with one degree of freedom (1DOF) - (un)damping, Elements for modeling the mechanical systems 2DOF - (un)damping, Elements for modeling mechanical systems xDOF and numerical methods for solving them, Mechanical vibrations of continuous systems (longitudinal, rotational and bending), Special problems of vibrational systems (biological systems, coupled problems etc.).

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Metode numerice, Rinderu, P.L., Gruionu, L., 2003, Editura Universitaria, Craiova

Vibratii mecanice – probleme rezolvate, Rinderu, PL, Bagnaru, D., Universitatea din Craiova, 1997

Mechanics of Structures Variational and Computational Methods, Walter Wunderlich, Walter Pilkey, Taylor&Francis, 2007

Teoria și practica vibrațiilor mecanice, I. Maghesi, Ed. Did. Ped., 2007.

**Subject of study: Materials technology (Code:D22ARL324)**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 2<sup>nd</sup> year / 1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course offers the students theoretical and practical concepts regarding the main technology of production and processing technical materials.

**CONTENT:** Classification of material properties; metal materials; obtaining metallic materials; metal casting; powder metallurgy; plastic deformation of metals; welding of metallic materials; technologies unconventional; NDT materials.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Gheorghe, St, Teisanu, C., Tehnologia materialelor, Editura Universitaria din Craiova, 2009.

Amza, Gh. ș.a., „Tehnologia materialelor”, Ed.Tehnică, București, 1999;

Butnariu, I ș.a. Procese și tehnologii în metalurgia extractivă, Editura Tehnică București, 1995.  
Cheșa, I ș.a. Alegerea și utilizarea oțelurilor, Editura Tehnică, București 1084.  
Gheorghe Șt. Aliaje sinterizate antifricțiune pe baza de cupru, Editura UNIVERSITARIA, 2002.  
Mangra, M. ș.a. Tehnologii și aplicații în metalurgia pulberilor, Editura Universitaria Craiova, 2002.

**Subject of study: Machining and machine-tools, Code: D22ARL325**

**NUMBER OF CREDITS:** 3  
**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> semester  
**TYPE OF COURSE:** Mandatory  
**OBJECTIVES:** The course teaches the students theoretical and practical knowledge regarding the machines manufacturing.  
**CONTENT:** Concepts regarding the chipping and the cutting tools theory. Elements of the machines kinematical chains theory. Products manufacturing on lathes. Products manufacturing on the drillers and the boring machines. Products manufacturing on the milling machines. Products manufacturing on the planing machines, slotters and die-slotting machines. Products manufacturing on the grinding machines. Gears teeth manufacturing on the gear cutting machines. Products manufacturing on machines with program command. Products manufacturing on aggregates and automatic lines.  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Written/oral examination  
**BIBLIOGRAPHY (selective):**  
Antonescu, N., Masini-unelte și prelucrări prin aschiere, Editura Didactică și Pedagogică, București., 1972.  
Botez, E., Maini-unelte, Editura Didactică și Pedagogică, București, 1973.  
Ivan, M., s.a., Masini – unelte și control dimensional, EDP., Buc., 1977.  
Zamfirache, M., Masini-unelte și prelucrări mecanice-Curs, Editura Universitaria, Craiova 1996.  
Zamfirache, M., Tehnologii de prelucrare-Curs, Editura Universitaria, 1998.  
Zamfirache, M., Prelucrări mecanice și masini – unelte, Editura Sitech, Craiova, 2005.  
Zamfirache, M., Prelucrabilitatea prin aschiere a unor materiale utilizate în construcția de autovehicule, Editura Sitech, Craiova 2012.

**Subject of study: Mechanisms I, Code: D22ARL 326**

**NUMBER OF CREDITS:** 5  
**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> semester  
**TYPE OF COURSE:** domain  
**OBJECTIVES:** The course provides general concepts about the structure, kinematics and dynamics of bar, cam and gear mechanisms and how these concepts may be applied in other disciplines and specialized fields.  
**CONTENT:** Structural analysis and synthesis of mechanisms. Kinematic analysis of mechanisms. Kinetostatic analysis of mechanisms. Dynamic analysis of mechanisms.  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Written examination  
**BIBLIOGRAPHY (selective):**

Nanu, Gh., Mecanisme – curs, Reprografia Universității din Craiova, 1996;  
Nanu, Gh., Dumitru, N., Mecanisme cu bare – teorie și aplicații, Editura Universitaria, Craiova, 2001;  
Popescu, I., Nanu, Gh., Cătăneanu, A., Mecanisme-Îndrumar de laborator, Reprografia Universității din Craiova, 1981;  
Vintilă, D., Nanu, Gh., Mecanisme – seminar și proiect, Editura Universitaria, Craiova, 2004;  
Dumitru, N., Nanu, Gh., Vintilă, D., Mecanisme și transmisii mecanice – Tehnici de modelare clasice și moderne, Editura Didactică și Pedagogică, București, 2008;  
Pelecudi, Chr., Maroș, D., Merticaru, V., Pandrea, N., Simionescu, I., Mecanisme, Editura Didactică și Pedagogică, București, 1985.

**Subject of study: Physical education I (Sport) (Code D22ARL328)**

**NUMBER OF CREDITS:** “1”  
**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> semester  
**TYPE OF COURSE:** Mandatory  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** -

**Subject of study: Foreign language (English, Francaise, Deutsch I (Code D22ARL329)**

**NUMBER OF CREDITS:** 2  
**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> semester  
**TYPE OF COURSE:** optional  
**TEACHING LANGUAGE:** -  
**EVALUATION:** Written/oral examination

**Subject of study: Basics of economy (Code D22ARL436)**

**NUMBER OF CREDITS:** 2  
**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> semester  
**TYPE OF COURSE:** Mandatory  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Written/oral examination

**Subject of study: Mechanisms II, Code: D22ARL430**

**NUMBER OF CREDITS:** 5  
**YEAR/SEMESTER:** 2<sup>nd</sup> year/2<sup>nd</sup> semester  
**TYPE OF COURSE:** domain  
**OBJECTIVES:** The course provides general concepts about the structure, kinematics and dynamics of bar, cam and gear mechanisms and how these concepts may be applied in other disciplines and specialized fields.  
**CONTENT:** Cam and intermittent motion mechanisms. Gear mechanisms. Synthesis of articulated mechanisms. Optimization of mechanisms.  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Written examination  
**BIBLIOGRAPHY (selective):**  
Nanu, Gh., Mecanisme – curs, Reprografia Universității din Craiova, 1996;  
Nanu, Gh., Dumitru, N., Mecanisme cu bare – teorie și aplicații, Editura Universitaria, Craiova, 2001;

Popescu, I., Nanu, Gh., Cătăneanu, A., Mecanisme – Îndrumar de laborator, Reprografia Universității din Craiova, 1981;  
Vintilă, D., Nanu, Gh., Mecanisme – seminar și proiect, Editura Universitaria, Craiova, 2004;  
Dumitru, N., Nanu, Gh., Vintilă, D., Mecanisme și transmisii mecanice – Tehnici de modelare clasice și moderne, Editura Didactică și Pedagogică, București, 2008;  
Pelecudi, Chr., Maroș, D., Merticaru, V., Pandrea, N., Simionescu, I., Mecanisme, Editura Didactică și Pedagogică, București, 1985.

**Subject of study: Strength of materials (I, Code: D22ARL327+II, Code: D22ARL 431)**

**NUMBER OF CREDITS:** 4+5

**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> and 2<sup>nd</sup> semester

**TYPE OF COURSE:** fundamental

**OBJECTIVES:** Achieve of computing skills in order to design mechanical constructions; Assimilation of knowledge on simple and complex demands of the various pieces of machinery, aggregates and machinery;

**CONTENT:** Sectional charts efforts; Axial efforts;; Surface geometric features; Torsion stress; Bending of straight beams stress; Elements of elasticity theory; Compound stress; Calculation of deformations; Statically indeterminate systems, Dynamic stress; Fatigue stress.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Boiangiu, D., Probleme de Rezistența materialelor, Editura Tehnică, București, 1989;  
Buzdugan, Gh., Rezistența materialelor, Editura Academiei, București, 1986;  
Buzdugan, Gh., ș.a., Rezistența materialelor, Culegere de probleme, EDP, București, 1979;  
Cernăianu, E., Petrescu, G., Rezistența materialelor, Teorie și probleme, Repr. U. Craiova, 1986;  
Cernăianu, E., Roșca, V., ș.a., Îndrumar de laborator, Repr. Universității din Craiova, 1989;  
Ilincioiu, D. Roșca, V., Rezistența materialelor, vol.1, Editura Scorilo, Craiova, 1999;  
Ilincioiu, D. Roșca, V., Caiet pentru Rezistența Materialelor, Editura Scorilo, Craiova, 1999;  
Mocanu, D.R., Rezistența materialelor, Editura Tehnică, București, 1980;  
Nădășan, Șt., Curs de Rezistența materialelor, Vol.I, II, III, Editura I.P.Timișoara, 1953-1957;  
Posea, N., Rezistența materialelor, Editura Didactică și Pedagogică, București, 1979;  
Roșca, V., Ilincioiu, D., Rezistența materialelor, vol.2, Editura Scorilo, Craiova, 1999;  
Roșca, V., Teoria Elasticității aplicată în Rezistența materialelor, Ed. Curtea veche, Buc., 1997;  
Roșca, V., Ilincioiu, D., ș.a., Rezistența materialelor, Încercări fundamentale, Editura Universitaria, Craiova, 2007.

**Subject of study: Technical physics (Code D22ARL432)**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 2<sup>nd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Computer aided design-basis, Code:D22ARL433**

**NUMBER OF CREDITS:** 5

**YEAR/SEMESTER:** 2<sup>nd</sup> year / 2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** To develop at students skills to generate a three-dimensional geometry with wireframe, solid modeling and surfaces techniques; to combine these models in virtual assemblies, and to automatically extract the plane documentation from 3D models;

**CONTENT:** The role of CAD system in a production cycle; components of a CAD system and its evaluation criteria, analytical representation of curves and surfaces; 3D surface modeling techniques: the primitive, by generation - revolution, extrusion, tubular, swept, rulers - rule, planar, loft, derived surfaces - blend, offset, fillet, corner); parametric solid modeling based on the sketch, geometric constraints and dimensional parametric solid modeling based on feature; Features for tree modeling crankshafts; Special modeling for crankcase; modeling features for cylinder heads; Use of standardized libraries, documentation extraction of virtual models, virtual assemblies, assembly constraints, exploded representations; A-class surfaces; specific modeling elements Body auto.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination, practical test

**BIBLIOGRAPHY (selective):**

Applications in Mechanical Desktop, Roșca, A., Ed. Universitaria 2005  
Basics of Computer Assisted Design, Roșca, A., Reprografia Universității, 2001  
Autocad design, Roșca A. ș.a., CERTI 1995  
Assisted computer design, Mazilu D., Note de curs, Reprografia Universității, 1999  
Murgulescu E., Analitic and Differential Geometry, EDP 1965  
\*\*\*, Company documentation, Mechanical Desktop  
\*\*\*, Company documentation, Dassault - Catia  
\*\*\*, Company documentation, Autodesk Inventor

**Subject of study: Fluids mechanics, Code:D22ARL434**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 2<sup>nd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** fundamental

**OBJECTIVES:** The course offers to the students the theoretical and practical concepts about the fluids flow with application in the mechanical engineering

**CONTENT:**

The main properties of fluids. The general methods of study used in the mechanics of fluids. The fundamental equations of the mechanics fluids. The kinematics of the fluid. The dynamics of the ideal fluids. The statics of fluids. The dynamics of the viscous fluids under the laminar and turbulent flow.

The applied of the mechanics of fluids.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Anton L., The mechanics of fluids and hydraulic machines, The Horizons University Publishing House, Timisoara, 1998  
 M. Buculei, M. Radulescu, Talu M., Mihaela Buculei, The mechanics of fluids and the hydraulics machinery .Vol.I, The Universitaria Publishing House, Craiova, 2011  
 Constantinescu VN, The dynamics of the viscous fluids under the laminar regime, The Academy Publishing House, Bucharest, 1983;  
 Ghe. Dan Ionescu, Introduction into the mechanics of fluids, The Technical Publishing House, Bucharest, 2005  
 Rădulescu V., N. Vasiliu – The fluid of mechanics, Fundamentals and Applications. Collection of problems, The Printech Publishing House, Bucharest, 2004;  
 Talu M., The fluid of mechanics. Theory and applications solved computationally using the finite element method or by numerical simulation. The Universitaria Publishing House, Craiova, 2008  
 Ungureanu V., The fluid of mechanics and the hydraulic machines, The Transilvania University Publishing House, Brasov, 2008;

**Subject of study: Tolerances and dimensional control, Code: D22ARL435**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 2<sup>nd</sup> year/ 2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course provides students with specific notions for dimensional and geometric accuracy of mechanical engineering parts, correct prescription of economic tolerances when designing assembly fits of main types: cylindrical and conical, with bearings, thread, feathers and grooves gear. Laboratory work skills training needed to perform control operations aimed in manufacturing processes of parts and assembly listed above, by performing measurements with different methods and measuring devices.

**CONTENT:** Dimensional and geometric tolerances. Surface roughness. Tolerances, fits and control of smooth cylindrical assemblies. Chains of dimensions. Tolerances, fits and control of conical parts and assemblies. Bearing assembly tolerances and fits. Tolerances, fits and control threaded fasteners. Tolerances, fits and control parts and assemblies with wedges and grooves. Tolerances, fits and control gear wheels and gear cylinders. 3D measurement with TESA MultiGage articulated arm.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**REFERENCES :**

David, I., Precizia de fabricație și montaj în construcția de mașini, Ed. Politehnica Timișoara, 2008.  
 David, I., Bagiu, L., Toleranțe și ajustaje, Ed. Printech, București, 2000.  
 David, I., Gubencu, D., Mălaimare, G., Toleranțe și ajustaje, Ed. Politehnica, Timișoara, 2005.  
 Chase C., Kenneth, W., Dimensioning and Tolerances Handbook, McGraw Hill Reyorsen Publishing House, New York, USA, 1999.

Dumitraș C., Popescu, I., Bendic, V., Ingineria controlului dimensional și geometric la fabricarea masinilor, Ed. Tehnică, București, 1998.

Henzold, G., Geometrical Dimensioning and Tolerancing for Design, Manufacturing and Inspection, Second Edition: A Handbook for Geometrical Product Specification using ISO and ASME standards, Kindle Edition, 2006.

Pascu, I., Stanimir Al., Toleranțe dimensionale și geometrice, Ed. Universitaria, Craiova, 2009.

Pascu, I., Toleranțe și ajustaje, Ed. Universitaria, 2007.

Pascu, I., Stanimir Al., Toleranțe și control dimensional. Îndrumar de laborator, Ed. Universitaria, Craiova, 2012.

Pascu, I., Vătafu, M. - Toleranțe și control dimensional. Îndrumar de laborator, Ed. Universitaria, Craiova, 2007.

**Subject of study: Physical education II (Sport) (Code D22ARL437)**

**NUMBER OF CREDITS:** "1"

**YEAR/SEMESTER:** 2<sup>nd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** -

**Subject of study: Foreign language II (English, Francaise, Deutsch I (Code D22ARL439)**

**NUMBER OF CREDITS:** 2

**YEAR/SEMESTER:** 2<sup>nd</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** optional

**TEACHING LANGUAGE:** -

**EVALUATION:** Written/oral examination

**Subject of study: Special materials for cars**

**NUMBER OF CREDITS:** 2

**YEAR/SEMESTER:** 2<sup>nd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** optional (specialized, domain)

**OBJECTIVES:** Constituent materials of automotive knowledge and technical materials used in the operation of the car. Establish operating conditions, operating requirements and criteria for choice of materials.

**CONTENT:** Basics vehicles. Getting technical tribology automotive applications. Oils, greases, solid lubricants and special pasta. Gear oils. Transmission fluids and hydraulic dampers. Fluids and technical materials: Liquids for engine cooling, brake fluid, electrolytes for electric accumulators. Plastics in automotive construction. Elastomers and their use in automobiles. Corrosion protection. Materials with acoustic features. Adhesives. Textiles in automotive interior. Activated carbon. For friction materials. Ceramic materials. Glass and its use in automobiles.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written colloquy

**BIBLIOGRAPHY (selective):**

Pană Monica - Materiale auto speciale - Notițe de curs.

Pană Monica – „Materiale compozite stratificate poliester - fibre de sticlă, cu aplicații în construcția de automobile”, Editura Universitaria Craiova, 2004  
Crivac, Gh., Preda Monica, s.a., „Tehnologii de fabricare a autovehiculelor”, Editura Universității din Pitești, 2002

Gheorghisor Marian – „Carburanti, lubrifianți și materiale auto speciale”, Editura Paralela 45, 2003

Marincaș D., Negruș, Radu Gh., Chiru A., „Combustibili, lubrifianți și materiale speciale pentru autovehicule” Editura Didactică și Pedagogică, București 1993

Mateescu M., Blejoiu S., „Combustibili, lubrifianți și materiale speciale pentru autovehicule rutiere” - Caiet de lucrări practice, Reprografia Universității din Craiova, 1996

**Subject of study: Practice, Code D22ARL438**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 2<sup>nd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination



## Third Year of study:

**Subject of study: The hydraulic and pneumatic drives, Code: D22ARL544**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 3<sup>rd</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES** The course offers to the students the theoretical and practical concepts used for design calculation of the hydraulic and pneumatic components and choosing these for the hydraulic and pneumatic systems.

**CONTENT:**

The internal problems in hydraulic systems (SAH). Flow balance equations in SAH. Fundamentals of the hydraulic resistances in SAH. The applications concerning the calculation of the hydraulic schemes in steady and unsteady regime of SAH. The apparatus used in the hydraulic and pneumatic systems. The hydraulic volume machines. The general theory of the hydraulic volume generators (GHV). Particular types of the rotary volume generators GVR. The volume rotary engines (MVR). The general theory of the stationary MVR. The stationary characteristics of the MVR. The linear volume engines (MVL). The general theory of the MVL. The stationary characteristics of the MVL. The practical problems in SAH concerning the installation of the hydraulic volume machines. The hydrodynamic machines. Fans.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Anton L., A. Baya, The Mechanics of fluids. The hydraulic Machines and drives, The Publishing Horizons University, Timisoara, 2002;

M.Buculei, M. Radulescu, Talu M., Mihaela Buculei, The mechanics of fluids and the hydraulics machinery. The Universitaria Publishing House, Craiova, 2011.

Rădulescu V., N. Vasiliu – The fluid of mechanics, Fundamentals and Applications, Collection of problems, The Printech Publishing House, Bucharest, 2004

Setaru I., V. Radulescu, The Mechanics of fluids and hydraulic systems. Fundamentals and applications, The Technical Publishing House, Bucharest, 1999;

Talu M., M. Radulescu, The hydraulic drives and automation. Theory and simulation. The Universitaria Publishing House, Craiova 2005.

Talu M., Talu S., M. Radulescu, The Mechanics of fluids. The volumic and hydrodynamic machines. Theory and simulation. The Universitaria Publishing House, Craiova, 2011.

Ungureanu V., The fluid of mechanics and the hydraulic machines, The Transilvania University Publishing House, Brasov, 2008;

**Subject of study: Electrotehnics and electrical Machines , Code D22ARL545**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 3<sup>rd</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Electronics and basics of automation systems, Code D22ARL546**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 3<sup>rd</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**SUBJECT OF STUDY: Elements of mechatronics, Code: D22ARL562**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 3<sup>rd</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course provides students familiar with the main mechatronic systems (sensors and actuators) that equip existing vehicles and applications processors mechatronic systems (intelligent auto).

**CONTENT:** The car as mechatronic products. Basic components and their functions. Sensors and actuators in automotive technology. Sensors for automotive applications. priority requirements Mechatronic systems for monitoring and adjusting the position. Transmission management systems. Mechatronic systems for monitoring stability. Acceleration and vibration sensors. Superficial film sensors. Hall type acceleration sensors. Piezoelectric sensors. Pressure sensors. Mechatronic systems for engine management. Detonation sensors. Flow measurement systems. Mass and volume flow sensors. Temperature sensors. Mechatronic systems for monitoring and controlling the movement and braking. Mechatronic systems for safety and comfort. Electromagnetic actuators and electromechanical systems used in safety and comfort we manage to drive actuators seats, mirrors, roof and central locking. Actuators for control of automated navigation and piloting. Fluid mechanical actuators. Hydraulic and pneumatic actuators.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**Subject of study: Machine Elements I (Code:D22ARL548) + II (Code: D22ARL654)**

**NUMBER OF CREDITS:** 5+3

**YEAR/SEMESTER:** 3<sup>th</sup> year/1<sup>st</sup>+2<sup>nd</sup> semester

**TYPE OF COURSE:** Technical culture of specialty.

**OBJECTIVES:** Promoting and developing of some concepts, machine elements design procedures and techniques from mechanical and mechatronic systems structure, stimulating and forming the creativity students skills by elaborating original solutions and modern design through facilities brought by CAD/CAM/CAE.

This course addresses to students which follows the 4 years undergraduate studies at Faculty of Mechanics from Automotive Engineering (AR), Industrial Engineering (TCM), Transport

Engineering (ITT), Engineering and Management (IEM).

**CONTENT:** Machine elements design basics; Screw fastening and power screw transmissions; Gears and gear transmissions; Chain drives; Friction wheels transmissions; Belt drives; Continuously variable transmissions; Shafts and axes; Rolling contact bearings; Sliding contact bearings; Couplings; Sealing elements; Threaded joints; Assemblies through sunk and tapered keys; Spline assemblies; Polygonal profiles assemblies; Cotter and knuckle joints; Conical couplings; Assemblies through conical friction elements; Clamp couplings; Fretting and fatigue assemblies; Assemblies through elastic and dumping elements.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**BIBLIOGRAPHY (selective):**

Catrina, Gh. s. a., Organe de mașini. Îndrumar de proiectarea pentru transmisii mecanice, Editura Universitaria. Craiova, 2012.  
Catrina, Gh., Proiectarea transmisiilor prin cuple elicoidale, Facultatea de Mecanică Craiova, 1988.  
Crudu, I., Atlas de reductoare, EDP, București, 1983.  
Dieter Muhs, s.a, Roloff/ Matek Machinenelemente Viewegs Fachbucher der Technik, 2003.  
Dumitru N., Margine A., Organe de mașini. Asamblări. Elemente elastice. Proiectare asistată de calculator. Editura Universitaria Craiova, 2002.  
Dumitru N., Margine, A., Catrina, Gh., ș.a., Organe de mașini. Arbori și lașăre. Proiectare asistată de calculator, Editura Tehnica, București, 2008, ISBN 978-973-31-2332-3.  
Dumitru, N., Nanu, Gh., Mecanisme și transmisii mecanice, Editura Didactică și Pedagogică, Craiova, 2008.  
Dumitru, N., Organe de mașini. Angrenaje. Elemente de proiectare, R. Univ. Craiova, Craiova, 1996.  
Dumitru, N., Organe de mașini. Transmisii mecanice, R. Univ. Craiova, Craiova, 1996.  
Ivanov M. N., Organe de mașini, Editura Tehnică „Chișinău”, Universitatea Tehnică a Moldovei, 1997.  
Robert L. MOTT, Machine Elements in mechanical Design, Prentice Hall, Columbus, Ohio, 1999.

**Subject of study: Thermotechnics and thermal machines I (Code:D22ARL549) + II (Code:D22ARL656)**

**Number of credits:** 5 credits/3 credits

**Year/Semester:** 3<sup>rd</sup> year/ 1<sup>st</sup> and 2<sup>nd</sup> semester

**Type of Course:** Mandatory

**Objectives:** The course present students the notions necessary for understanding thermal phenomena, utilisation of heat and to obtain mechanical work from heat. Also presents the basic principles of design and operation of thermal installation.

**Content:** General notions about the laws of perfect gas and simple transformations. The perfect gas mixtures and the thermodynamic principles. There are presented the methods for thermodynamics analyses. For the analyses of real processes of thermal machines are presented the real gases showing the differences of the properties are used in some technical applications. Are analyzed the theoretical principles of thermal machines through

the presentation of the methods for the study and evaluations of their performances.

**Teaching Language:** Romanian

**Evaluation:** written/ oral examination

**Bibliography:**

Bică, M., Cernăianu C.D., Bara, N., Termotehnică și mașini termice, Ed. Universitaria, Craiova 2010.  
Dănescu, Al.s.a. Termotehnică și mașini termice, E.D.P. Bucuresti 1985.  
Radenco Vsevolod, Marinescu Mircea, Băran Nicolae, *Termodinamică Tehnică. Teorie și aplicații*. Editura Tehnică, București, 1996.  
Ungureanu, C., Pănoiu, Zubcu, V., Ionel, I., Combustibili, instalații de ardere, cazane, Editura Politehnică N., Timișoara, 1998  
Kirilin, V. A., Sîcev, V.,V., Șeindlin, A.,E., Termodinamica, Editura Științifică și Enciclopedică, București 1985  
Laza, I., Mașini frigorifice, Editura Eurostampa, Timișoara 2005  
Horbanuic, B., Instalații frigorifice și de climatizare în industria alimentară, Editura CERMI, Iași 2006

**Subject of study: Tribology, Code: D22ARL550**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 3<sup>rd</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Optional

**OBJECTIVES:**

The course provides students with theoretical and practical concepts for the study of physical, mechanical, metallurgical and chemical interactions of elements in relative motion and lubrication issues.

**CONTENT:**

Definition and importance of tribology; Friction in joints; Tribotechnical systems; The deformable elastic body; Hertzian elastic contact; Elastic contact with friction; Lubricants; Friction regimes; State of lubrication and wear; Recommendations for friction joints materials selection.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Crețu S. Spiridon, Mecanica contactului, vol. I, Editura „Gh. Asachi” Iași, 2002.  
Popinceanu Nicolae, ș. a., Probleme fundamentale ale contactului cu rostogolire, Editura tehnică, București, 1985.  
Posea Nicolae, Rezistența materialelor, Editura Didactică și Pedagogică, București, 1979.  
Gafițanu Mihai, ș. a., Rulmenți-proiectare și tehnologie, Editura tehnică, București, 1985.  
Olaru, D, N., Tribologie. Elemente de bază asupra frecării, ungerii și uzării, Universitatea Tehnică „Gh. Asachi”, Iași, 1985.  
Catrina, Gh., Introducere in tribologie, Editura Universitaria, Craiova 2002.  
Bercea, I., Olaru, D.,N., Tribologia sistemelor mecanice, Universitatea tehnică „Gh. Asachi” Iași, 1998.  
Dudița, Fl., Diaconescu, D., Optimizarea structurală a mecanismelor, E. T., Bucuresti, 1987.

**Subject of study: Electrical and electronics equipment for automobiles, Code D22ARL552**

**NUMBER OF CREDITS:** 3  
**YEAR/SEMESTER:** 3<sup>rd</sup> year/1<sup>st</sup> semester  
**TYPE OF COURSE:** Optional  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Written/oral examination

**Subject of study: Processes and characteristics of internal combustion engines, Code:D22ARL657**

**NUMBER OF CREDITS:** 3  
**YEAR/SEMESTER:** 3<sup>rd</sup>year/2<sup>nd</sup> semester  
**TYPE OF COURSE:** Mandatory  
**OBJECTIVES:** Assimilation by learners of: notions specific to components and internal combustion engines operation; notions specific to the thermal processes and internal combustion engines characteristics. Formation of the aptitudes necessary to determinate parameters and indices which characterize thermal processes and interpretation of engines characteristics. Formation of skills concerning engines design in terms of thermal processes and characteristics.  
**CONTENT:** Genral consideration. Engines systematics. Internal combustion engines operation principle. Principal parameters and vehicles and tractors internal combustion engines operation principle. Thermodynamic cycles of piston engines. Operating regimes. Engine load. Change gas processes (normal filling four-stroke engines, filling two-stroke engines, filling forced the evacuation process). Compression process. Combustion process. Physico-chemical bases of the combustion process. Elements of thermodynamics and combustion kinetics. Elements of the ignition theory and spread of fire. Combustion in m.a.s. Combustion in m.a.c. Relaxation process. Engine's thermic calculation . Internal combustion engines characteristics.

**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Bobescu, Gh., ș.a., Motoare pentru automobile și tractoare, Volumul I, Teorie și caracteristici, Editura Tehnică, Chișinău, 1996;  
Challen, B., Baranescu Rodica, Diesel Engine Reference Book, Butterworth Heinemann, 1999;  
Dumitru I., Procese și caracteristici ale motoarelor cu ardere internă, Craiova, 2009;  
Grunwald, B., Teoria, calculul și construcția motoarelor pentru autovehicule rutiere, EDP, București, 1980;  
Negurescu, N., s.a, Motoare cu aprindere prin scanteie. Procese, Editura MatrixRom, Bucuresti, 2009;  
Pulkrabek, W., Engineering Fundamentals of the Internal Combustion Engine, Prentice Hall, New Jersey, 2002;

**Subject of study: Processes and characteristics of internal combustion engines, Project Code:D22ARL658**

**NUMBER OF CREDITS:** 2  
**YEAR/SEMESTER:** 3<sup>rd</sup>year/2<sup>nd</sup> semester

**TYPE OF Project:** Mandatory  
**TEACHING LANGUAGE:** Romanian  
**EVALUATION:** Written/oral examination

**Subject of study: Mechanical Systems Modelling Basics, Code: D22ARL659**

**NUMBER OF CREDITS:** 3  
**YEAR/SEMESTER:** 3<sup>rd</sup> year/2<sup>nd</sup> semester  
**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** This course forms and guide the students assimilation capacity for modelling and simulating, through modern methods, of the behavior in static and dynamic mode structures and mobile mechanical systems, based on multi body systems theory and finite element method. Another aim is the one that it can be develop and form, the students ability through applications by using important modelling and analysis software (ADAMS, ANSYS, etc.).

**CONTENT:** Elements of matrices and vectorial algebra. Computer kinematic and dynamic modelling through computational methods of mechanical mobile systems.

Kinematic modelling and simulations with ADAMS software. Linear elasticity elements. Finite element modelling basics. Finite element modelling in static and dynamic mode of mechanical structures (theory and applications). Modelling and simulations by using finite element method with ANSYS and COSMOS software.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**BIBLIOGRAPHY (selective):**

Amirouche, F., Computational methods in multibody dynamics, Prentice-Hall, 1992.  
Buculei M., Marin, M., Elemente de mecanică tehnică. Teorie și aplicații, Ed. Universitaria, Craiova, 1994.  
Brătianu, C., Metode cu elemente finite în dinamica fluidelor, București, Ed.Academiei, 1983.  
Corless, R.M., Essential in Maple, Springer-Verlag, 1995  
Dumitru N., Margine A., Bazele modelării în ingineria mecanică.Editura Universitaria Craiova, 2002.  
Dumitru N., Margine A., Organe de mașini. Asamblări. Elemente elastice. Proiectare asistată de calculator. Editura Universitaria Craiova, 2002.  
Dumitru N., Margine, A., Catrina, Gh., ș.a., Organe de mașini. Arbori și lagăre. Proiectare asistată de calculator, Editura Tehnica, București, 2008, ISBN 978-973-31-2332-3.  
Dumitru, N., Nanu, Gh., Mecanisme și transmisii mecanice, Editura Didactică și Pedagogică, Craiova, 2008.  
Logan, Daryl, A First Course in the Finite Element Method, PWS Publishing Company, Boston, 1992.  
Alexandru, P., Vișa, I. ș.a., Modelarea statico-dinamică a mecanismelor de ghidare ale roților automobilelor, Ed. LUX LIBRIS, Brașov, 2005.  
Neagoie, D., Calculul și construcția autovehiculelor, vol.I, II, Ed.Universitaria, Craiova, 2000.  
Oțăt, V., Bolcu, D., Thierheimer W., Simniceanu, L., Dinamica autovehiculelor, Ed.Universitaria, Craiova, 2005.

\*\*\* Ansys theory reference, 8th Edition SAS IP, Inc.

\*\*\*\* Adams flex guide Mechanical Dynamics rev. 10.0.

**Subject of study: Autovehicle Dynamics I, Code:D22ARL660**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 3<sup>rd</sup> year/ 2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course provides the students the appropriate knowledge and use of specific fundamental concepts of the discipline, allowing also the interpretation of this discipline specific notions regarding their application in the vehicle's structural components design, explain at the same time kinematics and dynamic theories that define vehicle's motion.

**CONTENT:** Organization and the main parameters of wheeled vehicles. The vehicles' self-propulsion.. Vehicles' wind drag. Reactions of the tread upon the vehicle's wheels. Vehicles' traction and braking dynamics. Fuel consumption. Vehicle stability. Vehicles' manipulation. Vehicles oscillation.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

1. Cordoș, T., Todoruț, A., *Dinamica autovehiculelor pe roți, Teste și Aplicații*, Editura TODESCO, Cluj-Napoca, 2001.
2. Dickson, C.J., *Tires, suspension and handling, Second Edition*, Society of Automotive Engineers, Inc., 1991.
3. Ghiulai, C., Vasiliu, C., *Dinamica autovehiculelor*, București, Editura didactică și pedagogică, 1975.
4. Gillespie, T.D., *Fundamentals of vehicle dynamics*, Society of Automotive Engineers, Inc., 1992.
5. Mitschke, M., *Dynamik der Kraftfahrzeuge*. Springer Verlag Berlin Heidelberg New York, 1990.
6. Oțăt, V., Bolcu, D., Thierheimer, W., Simniceanu, L., *Dinamica autovehiculelor*, Ed. Universitaria, ISBN 973-742-023-3 Craiova, 2005 ;
7. Oțăt, V., Cojocaru, A., Thierheimer, W., Turea, N., Boldor, Diana, *Dinamica autovehiculelor*, Vol II, Ed. U.T.M., ISBN 978-9975-45-005-8, Chisinau, 2007
8. Stoicescu, A.P., *Dinamica autovehiculelor, vol 1.*, Centrul de multiplicare I.P.B., București, 1980.
9. Stoicescu, A.P., *Dinamica autovehiculelor, vol 2.*, Centrul de multiplicare I.P.B., București, 1982.
10. Stoicescu, A.P., *Dinamica autovehiculelor, vol 3.*, Centrul de multiplicare I.P.B., București, 1986.

**Subject of study: Autovehicle Dynamics-Project, Code:D22ARL661**

**NUMBER OF CREDITS:** 2

**YEAR/SEMESTER:** 3<sup>rd</sup> year/ 2<sup>nd</sup> semester

**TYPE OF Project:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Fuels and lubricants, Code D22ARL647**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 3<sup>rd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**Subject of study: Heat and mass transfer, Code: D22ARL664**

**Number Of Credits:** 3

**Year/Semester:** 3<sup>rd</sup> year/2<sup>nd</sup> semester

**Type Of Course :** Optional

**Objectives:** It is presented the necessary background for understanding of the phenomenons that occurs in the thermal plants and machines. The are showed the fundamentals for the study of heat and mass transfer processes for steady and transient.

**Content:** General information about the heat transfer by conduction, convection and radiation for steady and transient conditions. The are presented the calculation methods for the global heat transfer with examples about the characteristics of the thermal insulation for different surfaces. For the mass transfer there are analyzed Fick's laws which describe the difussion phenomenon as process regarding the amount of substance that is being transported. As an exemple for technical applications there are studied the methods for thermal design of a heat changer.

**Teaching language:** Romanian

**Evaluation:** written examination

**Bibliography:**

- Bică, M., Cernăianu C.D., Bara, N., *Transfer de căldură*, Ed. Universitaria, Craiova 2010.
- Negru, D. – 1990 – *Transmiterea căldurii și dinamica gazelor*. Vol I. *Transmiterea căldurii*. LITTO.UIT
- Stefănescu, D., Leca, A. – 1983 – *Transfer de căldură și masă*. Editura Didactică și Pedagogică, Bucuresti
- Vladea, I. – 1974 – *Tratat de termodinamică tehnică și transmiterea căldurii*. Editura Didactică și Pedagogică, Bucuresti
- Leca, A. s.a. – 1988 – *Transfer de căldură și masă*. Editura Tehnică, Bucuresti
- Chiriac, F. s.a. – 1982 – *Procese de transfer de căldură și de masă*. Editura Tehnică Bucuresti

**BIBLIOGRAPHY (selective):**

- G.Gherghina- *Elemente de mecanica fina și mecatronica pentru autovehicle*, Ed.Universitaria Craiova, 2002
- G.Gherghina- *Elemente de mecatronica pentru autovehicle*, Ed.Sitech Craiova, 2007
- A. Popa. – *Componente și sisteme mecatronice. Aplicații*. Editura Politehnica, Timisoara, 2006

Laurentiu Manea, Adriana Manea- *Mecatronica automobilului modern*, Ed.MATRIX, 2001  
\*\*\*Colectia revistei Automotive Engineering

**Subject of study: Practice, Code D22ARL663**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 3<sup>rd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

## Fourth year of study:

**Subject of study: Autovehicle Dynamics II, Code:D22ARL770**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 4<sup>th</sup> year/ 1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course provides the students the appropriate knowledge and use of specific fundamental concepts of the discipline, allowing also the interpretation of this discipline specific notions regarding their application in the vehicle's structural components design, explain at the same time kinematics and dynamic theories that define vehicle's motion.

**CONTENT:** Organization and the main parameters of wheeled vehicles. The vehicles' self-propulsion.. Vehicles' wind drag. Reactions of the tread upon the vehicle's wheels. Vehicles' traction and braking dynamics. Fuel consumption. Vehicle stability. Vehicles' manipulation. Vehicles oscillation.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

1. Cordoș, T., Todoruț, A., *Dinamica autovehiculelor pe roți, Teste și Aplicații*, Editura TODESCO, Cluj-Napoca, 2001.
2. Dickson, C.J., *Tires, suspension and handling, Second Edition*, Society of Automotive Engineers, Inc., 1991.
3. Ghiulai, C., Vasiliu, C., *Dinamica autovehiculelor*, București, Editura didactică și pedagogică, 1975.
4. Gillespie, T.D., *Fundamentals of vehicle dynamics*, Society of Automotive Engineers, Inc., 1992.
5. Mitschke, M., *Dynamik der Kraftfahrzeuge*. Springer Verlag Berlin Heidelberg New York, 1990.
6. Oțăt, V., Bolcu, D., Thierheimer, W., Simniceanu, L., *Dinamica autovehiculelor*, Ed. Universitaria, ISBN 973-742-023-3 Craiova, 2005 ;
7. Oțăt, V., Cojocaru, A., Thierheimer, W., Turea, N., Boldor, Diana, *Dinamica autovehiculelor*, Vol II, Ed. U.T.M., ISBN 978-9975-45-005-8, Chisinau, 2007
8. Stoicescu, A.P., *Dinamica autovehiculelor, vol 1.*, Centrul de multiplicare I.P.B., București, 1980.
9. Stoicescu, A.P., *Dinamica autovehiculelor, vol 2.*, Centrul de multiplicare I.P.B., București, 1982.
10. Stoicescu, A.P., *Dinamica autovehiculelor, vol 3.*, Centrul de multiplicare I.P.B., București, 1986.

**Subject of study: Calculation and construction of internal combustion engines, Code: D22ARL771**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 4<sup>th</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The main objectives are represented by the study of notions of calculus and construction of internal combustion engines

**CONTENT:** Introduction to internal combustion engines. Kinematics of motor mechanism. Equilibration of engines. Piston. Segments. Engine bolt. Connecting rod. Crankshaft. Distribution

mechanism. Supply system. Lubrication system. Cooling system.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written

**BIBLIOGRAPHY (selective):**

- Abaitancei, D., Bobescu, Gh., *Motoare pentru automobile*, E.D.P., Bucuresti, 1975.  
Apostolescu, N., Bataga, N., *Motoare cu ardere interna*, E.D.P., Bucuresti, 1967.  
Banarescu, M., *Motoare cu ardere interna*, Ed. Tehnica, Bucuresti, 1957.  
Baranescu, G., *Teoria echilibrului motoarelor cu ardere interna in linie*, Ed. Academiei R.S.R., Bucuresti, 1975.  
Bobescu, Gh., s.a., *Motoare pentru automobile si tractoare*, Ed. Tehnica, Chisinau, 1996.  
Grünwald, B., *Teoria, calculul si constructia motoarelor pentru autovehicule rutiere*, E.D.P., Bucuresti, 1980.

**Subject of study: Calculation and construction of internal combustion engines, Project Code: D22ARL772**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 4<sup>th</sup> year/1<sup>st</sup> semester

**TYPE OF Project:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/Oral

**SUBJECT OF STUDY: Testing and approval of vehicles, Code:D22ARL773**

**NUMBER OF CREDITS:** 4

**YEAR / SEMESTER:** IV/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** This course provides students with theoretical and practical concepts concerning the approval and testing their vehicle to placement rules imposed by their current standards

**CONTENT:** Identifying possibilities for testing and approval of the concept vehicle systems

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written exam / oral

**BIBLIOGRAPHY:**

- Câmpian, O. – *Încercarea și omologarea autovehiculelor*, Editura Universității Transilvania Brașov, 2004.  
Mondiru, C., Zaharia, C. – *Stații service pentru automobile*, Editura Universității din Pitești, 2004.  
Frățilă, Gh., ș.a. – *Manualul mecanicului auto*, Editura Didactică și Pedagogică, București, 1986.  
Popa, B., ș.a. – *Rodarea și uzura motoarelor cu ardere internă*, Editura Tehnică, București, 1967.  
\*\*\* - Norme interne de service auto.  
\*\*\* - Cataloage auto pentru diferite autovehicule.

**SUBJECT OF STUDY: Special installations for autovehicles, Code: D22ARL774**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 4<sup>th</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course presents students general concepts regarding the construction and

operation of special equipment for motor vehicles and facilities command and control knowledge elements managed by the Central Unit Calculator.

**CONTENT:** Mixture preparation systems at MAS: Electronic equipment for low pressure gas injection. Electronics gasoline direct injection. Mixture ignition engines Otto engine Power Plant classical MAC. Injection systems m.a.c. with electronic control of fuel injection. Overeating engines. Control of motor vehicle emissions. Engine cooling control with variable speed fans special equipment electronic stability control. Special equipment electronic traction control, steering and suspension. Safety features and comfort.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Cristea, D., Ivan, F., „Calculul și construcția instalațiilor auxiliare ale automobilelor”, Reprografia Universității din Pitești, 1993

Cristea, D., „Sisteme speciale ale automobilelor”, Editura Universității din Pitești, 1999

Laurentiu Manea, Adriana Manea - Mecatronica automobilului modern, Ed. MATRIX, 2001

Pană Monica „Echipamente speciale pentru alimentarea motoarele de automobile”, Editura Universitaria Craiova 2006

Pană Monica Instalatii auxiliare pentru motoarele auto”, Editura Universitaria Craiova 2006

Rakosi E., Manolache Ghe. Suport de curs: „Instalatii anexe ale motoarelor pentru autovehicule rutiere” , Universitatea tehnica „Gh. Asachi” Iasi, 2006

Stratulat, M., Copae, I., „Alimentarea motoarelor cu aprindere prin scânteie”, vol. I și II, Editura Tehnică, București, 1998

Șerban F. Suport de curs: „Mecatronica automobilelor”, Universitatea din Pitești 2002

**Subject of study: Calculation and Construction of Automobiles I (Code: D22ARL775)+ II (Code: D22ARL882)**

**NUMBER OF CREDITS:** 5/1<sup>st</sup> semester, 2/2<sup>nd</sup> semester

**YEAR/SEMESTER:** 4<sup>th</sup> year/1<sup>st</sup> and 2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** Discipline aims to make students acquire the basic concepts of calculation and construction of the automobiles, organological analysis skills development, skills development of design and creativity in the field of automobiles.

**CONTENT:** General concepts about automobiles, construction and calculation elements for: clutches, gearboxes, longitudinal transmissions, front and rear axles, steering systems, braking systems, suspension systems.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Buzdugan Gh. Rezistența materialelor, Editura tehnică, București, 1980.

Catrina, Gh., Organe de mașini, Vol. I., Vol. I., Reprografia Universității din Craiova, 1997.

Frățilă, Gh. - Calculul și construcția automobilelor, Editura didactică și pedagogică, București, 1977

Neagoe D. Transmisia autovehiculelor, Editura Universitaria Craiova 2004.

Neagoe D. Calculul și construcția autovehiculelor Vol. II, Reprografia Universității Din Craiova 2004.

Neagoe D. s.a., Calculul și construcția autovehiculelor- Indrumar de laborator, Editura Universitaria Craiova 2006.

Tabacu, Ion - Transmisii mecanice pentru autoturisme, Ed. Tehnică, București, 1999.

Untaru, M. ș.a. Automobile, Editura didactică și pedagogică, București, 1975.

**Subject of study: Calculation and Construction of Automobiles -Project (Code: D22ARL883)**

**NUMBER OF CREDITS:** 2/2<sup>nd</sup> semester

**YEAR/SEMESTER:** 4<sup>th</sup> year/2<sup>nd</sup> semester

**TYPE OF Project:** Mandatory

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Road vehicle manufacturing technologies I (Code:D22ARL776) + II (Code: D22ARL881)**

**NUMBER OF CREDITS:** 3-1<sup>st</sup> semester/3-2<sup>nd</sup> semester

**YEAR/SEMESTER:** 4<sup>th</sup> year/1<sup>st</sup> and 2<sup>nd</sup> semester

**TYPE OF COURSE:** Mandatory

**OBJECTIVES:** The course provides students with theoretical and practical concepts conceptual and technological principles of vehicle manufacture

**CONTENT:** General notions about processes, determine the elements necessary preparation processes, automotive moldings, the calculation precision machining, surface quality automotive parts, bases, dimensions and devices working methods and reconditioning of vehicle parts, manufacturing technologies tree parts, manufacturing technology type parts bush, technology manufacturing pistons, rings and connecting rod, manufacturing technology type casing parts. painting and additional protection vehicles..

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Tică, B., Fabricarea și repararea industrială a autovehiculelor. Universitaria Craiova, 2008.

Crivac, Gh., Tica B, ș.a., Tehnologii de fabricare a autovehiculelor. Ed.Universității din Pitești, 2002.

Nicolae,V.,Crivac,Gh.,Ilie,S., Fabricarea și repararea industrială a autovehiculelor, Ed. Universității din Pitești, 2001.

\*\*\* Automotive engineering, 1997-2011.

\*\*\* Automotive Handbook - BOSCH, 1993.

\*\*\* Auto Technology, 1999-2010.

**Subject of study: Equipment and automotive diagnostic techniques, Code D22ARL877**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 4<sup>th</sup> year/ 2<sup>nd</sup> semester

**TYPE OF COURSE:** fundamental

**OBJECTIVES:** The course provides students with knowledge regarding vehicles' specific elements of diagnosis equipment and techniques, and training skills in automotive diagnosis and understanding, explaining and interpreting theoretical and practical content of the discipline.

**CONTENT:** General principles of diagnosis. General diagnosis of the vehicle. Diagnosing the technical condition of the engine. Diagnosing the ignition system. Diagnosing the technical condition of the transmission. Steering Diagnosis. Brake System Diagnosis. Suspension Diagnosis. General diagnostics using electronic tester.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Manea, C., Stratulat, M., „Fiabilitatea și diagnosticarea automobilelor”, Editura Militară, 1982;  
Mondiru C., „Automobile Dacia , Diagnosticare, întreținere, reparare” ,Editura Tehnică , București, 1998;  
Negruș, E., ș.a. „Încercarea autovehiculelor”, E.D.P., 1983;  
Oțăt, V., Dumitru, I., ș.a., „Echipamente și tehnici de diagnosticare pentru autovehicule”, Editura Universitaria, Craiova, 2007;  
Oțăt, V., Simniceanu, L., „Încercarea autovehiculelor”, Ed. Universitaria, Craiova, 2004;  
Stratulat,ș.a.Diagnosticarea automobilelor, Editura Militară București , 1990

**Subject of study: Car bodies and structures, Code:D22ARL878**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 4<sup>th</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** fundamental (specialized, domain)

**OBJECTIVES:** Learning general concepts of body building, knowledge of computing elements and aspects of the design for vehicle bodies and structures, Knowledge of technological achievement and test phases of vehicle bodies and structures; Primary security; Cockpit ergonomics.

**CONTENT:** General considerations on the construction of bodies. Technical design of the body shape and the bearing structure. Items for car body design. Body design elements for buses and trucks. Body as a security feature. Constructive measures and methods for conditions regarding: information security, security primary (active) and secondary safety (passive protection). Tests of passive safety body. Calculation of body elements. Solutions and building blocks bearing structures. Materials used in car body construction. Corrosion and corrosion protection of metal parts.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Crivac, Gh., Preda Monica, s.a., „Tehnologii de fabricare a autovehiculelor”, Editura Universității din Pitești, 2002  
Ivașcu, A., Preda Monica, Țuică, A., „Îndrumar pentru proiectarea caroseriilor auto”, Tipografia Universității din Craiova, 2002  
Pană Monica, Țuică, A., Ivașcu, A., „Caroserii și structuri portante pentru automobile” - Notițe de curs redactate - Material pe suport informatic  
Roșca, R., „Caroserii și Structuri Portante”, Editura Odeon, Vaslui, 1999

\* \* \* Prescripțiile unor standarde internaționale în domeniul auto (ISO, ECE/ ONU-Geneva, CEE/ Piața Comună-Bruxelles).

\* \* \* Prescripțiile unor standarde naționale în domeniul auto (STAS-România, SAE-S.U.A., BNA-Franța, DIN- Germania, FMVSS-S.U.A., CMVSS-Canada, KS-Coreea de Sud etc.).

\* \* \* Standarde de firmă (Daewoo, Citroen, Peugeot, Opel, Renault etc.).

Automotive Engineering SAE Internațional, 1998-2007

**Subject of study: Reliability of vehicles, Code:D22ARL879**

**NUMBER OF CREDITS:** 4

**YEAR/SEMESTER:** 4<sup>nd</sup> year/2<sup>nd</sup> semester

**TYPE OF COURSE:** specialty

**OBJECTIVES:** Learning by students of the relationship of reliability, maintainability and terotechnics vehicles

**CONTENT:** Reliability: reliable vehicles; Study of reliability, object definitions;

Random variables; Theoretical aspects of reliability, the basic parameters; Primary processing of experimental data; Theoretical laws of distribution used in reliability; Confidence intervals; Parameters of reliability for repairable items and unrecoverable; Reliability of systems; Reliability tests..

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**BIBLIOGRAPHY (selective):**

Nagy, T., Fiabilitatea și terotehnica autovehiculelor, vol. I, Universitatea Transilvania, Brașov, 1997;  
Pisoschi, Al.-Gr., Terotehnica și fiabilitatea autovehiculelor, Universitatea din Craiova, Craiova, 1998.  
Dumitru, I., Pisoschi, Al.-Gr., Terotehnica și fiabilitatea autovehiculelor, lucrări de laborator-îndrumar, Reprografia Universității din Craiova, 1999  
Pisoschi, Al.-Gr., Popa, Gh., Constantinescu, A., Elemente de durabilitate, fiabilitate și mentanabilitate, Editura Universitaria, Craiova, 2006

**Subject of study: Special transmissions for autovehicles, Code: D22ARL785**

**NUMBER OF CREDITS:** 2

**YEAR/SEMESTER:** 4<sup>th</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** Optional

**OBJECTIVES:** Student acquaintances with different formalisms used in mechanical transmissions modelling; thoroughgoing study, previously acquired, regarding mechanical transmissions; student acquaintances with numerical computations specific aspects, applicable on kinematic and dynamic studies of mechanical transmissions with variable structure.

This course addresses to 4<sup>th</sup> year students which follows the 4 years undergraduate studies at Faculty of Mechanics from Automotive Engineering (AR).

**CONTENT:** Knowledge regarding the mechanical transmissions structure and topology; mechanical transmissions classification; mechanical transmissions with invariable structure; mechanical

transmissions with variable structure; transfer functions; algorithms for mechanical transmissions kinematic analysis; mechanical transmissions kinematic optimization; error sources in mechanical transmissions kinematic analysis; algorithms for optimizing the mechanical transmissions kinematic synthesis; mechanical transmissions efficiency evaluations.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written examination

**BIBLIOGRAPHY (selective):**

Catrina, Gh. s. a., Organe de mașini. Îndrumar de proiectarea pentru transmisii mecanice, Editura Universitaria. Craiova, 2012.

Catrina, Gh., Proiectarea transmisiilor prin cuple elicoidale, Facultatea de Mecanică Craiova, 1988.

Crudu, I., Atlas de reductoare, EDP, București, 1983.

Dieter Muhs, s.a, Roloff/ Matek Machinenelemente Viewegs Fachbucher der Technik, 2003.

Dumitru, N., Organe de mașini. Angrenaje. Elemente de proiectare, R. Univ. Craiova, Craiova, 1996.

Dumitru, N., Organe de mașini. Transmisii mecanice, R. Univ. Craiova, Craiova, 1996.

Ivanov M. N., Organe de mașini, Editura Tehnică „Chișinău”, Universitatea Tehnică a Moldovei, 1997.

Margine, Al., Contributii la sinteza geometro-cinematica si dinamica a mecanismelor planetare si diferentiale complexe realizate cu roți dintate cilindrice. Teza de doctorat. Universitatea „Politehnica” Bucuresti 1999.

Margine, Al., Catrina, Gh., Calculul functiei de transmitere pentru mecanismele planetare si diferentiale complexe realizate cu roți dintate cilindrice. In Analele Universitatii din Craiova, Seria Mecanica, nr. 1/1999.

Margine, Al., Catrina, Gh., Aspecte privind cinematica mecanismelor planetare simple cu roți dintate cilindrice, cu structura variabila. In Analele Universitatii din Craiova, Seria Mecanica, nr. 1/1999.

Margine, Al., Catrina, Gh., Sinteza expresiilor rapoartelor cinematice ale mecanismelor diferentiale simple din componenta mecanismelor planetare complexe cu structura variabila. In Buletinul stiintific, seria C, vol. XV, Universitatea de Nord Baia Mare, 2001

Robert L. MOTT, Machine Elements in mechanical Design, Prentice Hall, Columbus, Ohio, 1999.

David A. Hensher, Kenneth J. Button, Handbook of Transport Modelling, Pergamon, 2000;

Dumitru I., Trafic rutier, Note de curs, 2011;

Dumitru I., Trafic rutier, Elemente aplicative, Editura Universitaria 2008;

Homburger, W.S., Keefer, L.E., McGrath, W.R., editori, Transportation and Traffic Engineering Handbook 2nd edition, Institute of Transportation Engineers, Washington D.C. 1982;

Nistor, N., Vasiliu, Ch. Teoria traficului rutier și siguranța circulației. Ed. Universității București. 1977;

Pereș, Gh., ș.a., Teoria traficului rutier și siguranța circulației, Tipografia Universității, Brașov, 1982.

Roger P. Roess, Elena S. Prassas, Willian R. McShane, Traffic Engineering- third edition, Pearson, Prentice Hall, 2004

**Subject of study: Management (Code: D22ARL888)**

**NUMBER OF CREDITS:** 2/2<sup>nd</sup> semester

**YEAR/SEMESTER:** 4<sup>th</sup> year/2<sup>nd</sup> semester

**TYPE OF Project:** Optional

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**Subject of study: Technical expertise of the traffic crash, Code D22ARL787**

**NUMBER OF CREDITS:** 3

**YEAR/SEMESTER:** 4<sup>th</sup> year/1<sup>st</sup> semester

**TYPE OF COURSE:** optional

**OBJECTIVES:** Assimilation of the scientific concepts specific to technical expertise and traffic crash.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** Written/oral examination

**BIBLIOGRAPHY (selective):**

Allan Bonnick, Automotive Science and Mathematics, Elsevier, 2008;

Boris S. Kerner, Introduction to Modern Traffic Flow Theory and Control, Springer-Verlag Berlin Heidelberg, 2009