Field of Study: Road vehicles Engineering
Programme of studies: Automotive Engineering – Design, Manufacture and Development (AED)

First year of study:

Subject of study: Fundamentals of automotive engineering

CODE: D22AED101
Number of credits: 4
Year/Semester: 1st year , 1st semester
Type of Course: Mandatory
Objectives: Presentation of the theoretical and practical concepts of the kinematic and dynamic theories defining the motions of road vehicles
Content: General organization and main parameters of road vehicles. The process of self-propulsion of the cars. Clutch. Gearbox. Front and rear axis.Steering system. Breake system.
Teaching Leanguage: English
Evaluation: written/ oral examination
Bibliography:
Gillespie, T.D., Fundamentals of vehicle dynamics, Society of Automotive Engineers, Inc., 1992.
Macarie, T.N., Automobile – Dinamica, Editura Universităţii din Piteşti, Piteşti, 2003.
Mateescu, V., Popa, L., Performanţele automobilului, Editura Printech, 2000.
Mitschke, M., Dynamik der Kraftfahrzeuge. Springer Verlag Berlin Heidelberg New York, 1990.
Neagoe, D, Transmisia Autovehiculelor, Editura Universitaria, Craiova, 2004
Oţăt V., Simniceanu L., Dinamica autovehiculelor, Editura Universitaria, Craiova
Pisoschi Alex., - Neagoe. D., - Cunoaşterea generală a autovehiculelor, Tipografia Universtăţii din Craiova. 2002.
Stoicescu, A.P., Dinamica autovehiculelor, vol 1., Centrul de multiplicare I.P.B., Bucureşti, 1980.
Tabacu, I., Transmisii mecanice pentru autoturisme, E T. Bucureşti 1999

Subject of study: Quality Techniques

CODE: D22AED102
NUMBER OF CREDITS: 4
YEAR/SEMESTER: 1st year/1st semester
TYPE OF COURSE: mandatory
Objectives: Students' understanding of the concepts, principles, techniques and quality tools for the continuous improvement of the activity of an organization in order to fulfill its the policy and objectives.
Content: Introduction in theory and quality management. Managerial techniques - quality management systems. (ISO 9000 model; Total Quality Management; Six Sigma; Lean Manufacturing). Traditional technical techniques of quality (Histogram; Pareto diagram, Fishbone diagram etc.). Modern techniques of quality management. Other quality improvement techniques
Teaching Leanguage: English
Evaluation: written/ oral examination
Bibliography:

Borror, C. – The Certified Quality Engineer Handbook, Third edition, ASQ, 2009
Cherciu, M. (2003) – Managementul calităţii. Concepte şi principii fundamentale, Craiova, Editura Universitaria.
Griffith, G. (2013) - The Quality Technician's Handbook, Sixth Edition, Pearson, USA
Kifor, C.V. şi Oprean,C.(2002)– Ingineria calităţii, Editura Universităţii "Lucian Blaga", Sibiu.
Martinescu, I. şi Martinescu, D. (2006)- Auditul Sistemelor de Management, Editura Lux Libris, Braşov
Militaru C. si Greabu A. (2009) – Calitate si Standardizare in Inginerie Mecanica, editura Standardizarea, Bucuresti, ISBN 978-606-8032-07-8
Olaru, M. ş.a. (2000) - Tehnici şi instrumente utilizate în managementul calităţii, Editura Economică.
Oprean, C. şi Kifor, C.V. (2002)– Managementul calităţii, Editura Universităţii "Lucian Blaga", Sibiu.
Rusu, C, ş.a. (2002)-Bazele managementului calităţii, Cluj-Napoca, Editura Dacia.
Trandafir, M. s.a.(2005) – Calitatea. Dictionar explicativ, Bucuresti.
*** - Familia de standarde ISO 9000
***- Standardul ISO 19011

Subject of study: Measurements and ergonomic modeling in automotive industry

CODE: D22AED103
Number of credits: 5
Year/Semester: 1st year , 1st semester
Type of Course: optional
Objectives: Knowledge of the human body's abilities relative to the work process in the car and the environment necessary for the driving activity
Content: Ergonomics - the basic science of designing the workplace. Anthropometric measurements – overview. Specific environmental parameters in the automotive industry and effects on the human body. Principles of ergonomic work place organization and measurement of the main ergonomic parameters. Principles of ergonomic organization of the driving position of the vehicle. Use of ergonomic analysis software specific to the automotive industry.
Teaching Leanguage: English
Evaluation: written/ oral examination
Bibliography:
Burloiu P. Managementul resurselor umane, Ed. Lumina Lex., B. 1997
Burloiu P. Economia şi organizarea ergonomică a muncii. Ed. Medicală, B., 1993
Celoveceschii factor (6 tomov), Mir, M., 1991
Kapandji I.A. Physiologie articulaire-schemas commente de mecanique humaine, Librairie Maloine, Paris 1970
Mihăilă I. Şi colab., Bazele ştiinţifice şi aplicaţiile ergonomiei. Ed. Medicală, B., 1982.

Moldovan M. Ergonomie. Ed. Didactică şi pedagogică, B., 1993
Robacki R., Anatomia funcţională a omului, Ed.Scrisul românesc, Craiova 1985
******** Manualul de utilizare al echipamentelor utilizate în măsurători

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Subject of study: Manufacturing proceses and equipment for automotive

CODE: D22AED104
NUMBER OF CREDITS: 4
YEAR/SEMESTER: 1st year/1st semester
TYPE OF COURSE: mandatory
OBJECTIVES: Presentation of the main manufacturing equipments and technological processes used in the automotive industry
CONTENT: Forming and Joining: Materials Forming - Forming of Polymer and Composite Materials. Forming and Joining: Metal Forming. Machining and Tolerancing Systems:Tolerancing System. Nanomanufacturing and Non-Traditional Machining. Robotics and Automation. 3D prototyping (Additive Manufacturing). Surface Technology.
TEACHING LANGUAGE: English
EVALUATION: Written examination
BIBLIOGRAPHY (selective):
Handbook of Manufacturing Engineering and Technology, Andrew Y. C. Nee, Editor, 2015, Springer Reference.
Manual imprimanta 3D Systems ProX DM320
Manual imprimanta Stratasys Fortus 400 mc
Manual Abaqus
Manual Tosca
5Note curs/laborator

Subject of study: Automation and Robotics in automotive engineering

CODE: D22AED105
Number of credits: 5
Year/Semester: 1st year , 1st semester
Type of Course: optional
Objectives: Methods presentation for using automated systems and robotic structures in the automotive industry
Content: Basic Automation: Dynamic models. Transfer function. State variable models. Feedback control systems: poles and zeros, steady state error, time domain performances, frequency domain performances, stability of linear feedback systems, design of closed-loop control.
Robotics: Basic components of the robot system; Functionality of the robot system in industrial applications; Basic kinematics of the industrial robots; Direct and inverse kinematics; Motion generation: pick-and-place operation and continuous-path motion; Compliant motion; Dynamics
Sensing and Perception: Measurement systems: linear and rotational sensors for position, velocity and acceleration; Sensor systems: tactile sensors, force sensors, and torque sensors
Actuators: principles, hydraulic actuation, pneumatic actuation, electrical actuation
Robot control: principles, conventional closed-loop control, state variable control
Principles of robot programming

Automated manufacturing
Splitting assembly systems and the manufacturing process
Teaching Leanguage: English
Evaluation: written/ oral examination
Bibliography:
Springer Handbook of Robotics, Editori Bruno Siciliano, Oussama Khatib, Springer-Verlag Berlin Heidelberg 2008.
Robotics, Vision and Control: Fundamental Algorithms in MATLAB (Springer Tracts in Advanced Robotics), Peter Corke, ISBN-13: 978-3642201431, 2013.
From Classical To Modern Mechanical Engineering-Fundamentals, Ivanescu, M , Ed Academia Romana, Bucharest ,ISBN 978-973-27-1561-1,2007
Sisteme Avansate De Conducere În Robotică, Ivănescu M, Editura Scrisul Romanesc, ISBN: 973-38-0389-8, 2003
Sisteme flexibile de fabricatie, Nitulescu M., Editura Sitech, 1997.
Limbaje de programare a robotilor industriali, Bîzdoacă N., Diaconu I, Editura Sitech, ISBN 973-9346-88-X, 1999

Subject of study: Ethics and academics integrity

CODE: D22AED106
Number of credits: 4
Year/Semester: 1st year , 1st semester
Type of Course: mandatory

Subject of study: Scientific researche/practice

CODE: D22AED107
Number of credits: 5
Year/Semester: 1st year , 1st semester
Type of Course: mandatory
OBJECTIVES: Developing specific study program abilities by identifying the fundamental and documentary elements related to the analysis of technical norms and research in the field
CONTENT: Scientific research: defining the theoretical, applied, experimental and analytical elements. Classical and modern bibliographic research techniques on a given theme. Drawing up a bibliography; references and footnotes. Choosing the field of research and proposing a theme. Establish the main objectives within the activity. Documentation on the fundamentals of the research-design field chosen. Search engines specific to stintificial research. Identifying important achievements, defining the proposed themes. Scientific report resulting from bibliographic research on a given topic; summary and keywords that characterize the theme; content of ideas, critical analysis, personal opinions, conclusions. Presentation of scientific articles: elaboration of the presentation of the article; estimating the length of the presentation according to the time limits; designing the presentation form; preparation of the presentation
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):
Belous, V., Plăhteanu, B. Fundamentele creaţiei tehnice. Editura Performantica, Iaşi , 2005

Enăchescu,C. Tratat de teoria cercetării ştiinţifice, Editura Polirom, Iaşi, 2005
Manolea, Gh. Bazele cercetării creative, Editura AGIR, Bucureşti 2006

Subject of study: Elements of virtual prototyping in automotive engineering

CODE: D22AED208
NUMBER OF CREDITS: 4
YEAR/SEMESTER: 1st year/2nd semester
TYPE OF COURSE: mandatory
OBJECTIVES: Forming students' skills in modeling of parts and assemblies, kinematic and dynamic simulation, analysis of stress states and deformations of the studied parts and assemblies, using the finite element method.
CONTENT: Introduction to the virtual prototyping. CAD software system, main modules, analysis module, user interface. Introduction to Sketching. Basic Part Modeling. Assembly software module. Drawing module. Motion module. FEA module. Modeling and kinematic analysis. Introduction to the virtual prototyping. CAD software system, main modules, analysis module, user interface
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):

G. Gherghina, D. Popa, M. Tudor, Notiuni de grafica tehnica, Teorie si aplicatii, Desen tehnic, pp. 139, Reprografia Universitatii din Craiova, 2000;
D. Popa, L. Sass, G. Gherghina, A. Duta, G. Stanescu, Grafica asistata de calculator. De la 2D la 3D, ed. Sitech, pp. 235, ISBN 978-973-746-505-4, Craiova, 2007 ;
Peterson, Michael Todd, 3D STUDIO MAX. Fundamente, Editura Teora, Bucuresti, 1998;
D. Popa, G. Gherghina, Infografica, Ed. Sitech, ISBN 978-606-530-028-6, pp. 308, Craiova 2008;
**** SolidWorks Tutorials, 1997-2018;
**** VisualNastran,Tutorials, 1997-2004;
**** Ansys,Tutorials, 1997-2018.

Subject of study: Design for manufacture

CODE: D22AED209
NUMBER OF CREDITS: 5
YEAR/SEMESTER: 1st year/ 2nd semester
TYPE OF COURSE: mandatory
OBJECTIVES: This course provides the students with the specific knowledge and the appropriate use of specific fundamental concepts of the discipline, and explaining moreover specific methods and techniques as well as advanced calibration tests upon vehicles, aiming thus at acquiring advanced knowledge in the field of vehicle testing.
CONTENT: Design for manufacture. Design for X. Definitions. Introduction. Design for manufacture General Principles of manufacturability. Design for Manufacturability Methodology (DFM). Problem Formulation. New Product Vision.
Concept Generation. Concept Selection. Detail Design. Design Validation. Design and drawing tips (Fasteners, Material selection, Final design details, Leverage DFM knowledge). Rules for all parts designed and drawings submitted to manufacture. Criteria and technique for DFM. Key to advantages. Key to disadvantages.. Design automation requirements to support integrated product development. Product design. Process design. Data interchange. Design for manufacturing processes. General guidelines. Machining. CNC machining guidelines
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):

De Garmo, Paul Black, J.T., Kohser, Ronald, A.,Materials and processes in manufacturing, Eighth Edition, Prentice-Hall, Inc., Upper saddle River, New Jersey, USA, 1997
Stoll, H., W.,Design for Manufacturing: An Overview. ASME Applied Mechanics Reviews, 39 (9), pp. 1356-1364,1986
Tamas Szecsi, Design For Manufacture And Assembly - Module Notes - 7-th Edition, School of Mecanical and Manufacturing Engineering, Dublin City University, 2007
Whitney, D. E , Mechanical Assemblies: Their Design, Manufacture, and Role in Product Development , New York, NY: Oxford University Press, 2004. ISBN: 019515782, 2004
Craciunoiu Nicolae, Notiuni de baza privind programarea strungurilor cu comanda numerica, 2017Craiova Electronic/Printat
Craciunoiu, N., Proiectare şi fabricaţie asistată, Aplicatii practice. Craiova, Format Electronic , 2010,
Crăciunoiu, N., ş.a. Introducere în proiectarea asistată de calculator, Editura SITECH, Craiova, 2009
Craciunoiu Nicolae, Proiectare pentru fabricare / Design for manufacture, Craiova 2014, Electronic
****Carte tehnica Imprimanta 3D, Dimension SST 1200es, Stratasys
*** Solid Works 2015

Subject of study: Innovatives technologies in automobiles manufacturing

CODE: D22AED210
NUMBER OF CREDITS: 4
YEAR/SEMESTER: 1st year/2nd semester
TYPE OF COURSE: mandatory
OBJECTIVES: Knowledge of modern technologies for obtaining automotive parts other than cutting processes.
CONTENT: Modern technologies for the development of automotive parts by powder metallurgy: the technological flow of parts development through MP; MP applications self-lubricating bearings; electric brushes; toothed wheels obtained by sinter-molding. MIM metal injection moulding. Modern manufacturing technologies by casting in special temporary molds: casting parts with light fusible patterns; casting parts with thermoresistant models. Modern Manufacturing Technologies by Casting in Permanent Forms: Pressure Die Casting. Centrifugal Casting
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):

Tehnologia Materialelor Gheorghe Stefan, Editura UNIVERSITARIA, Craiova2009

Metalurgie Fizica pentru Ingineri. C. Teisanu, St Gheorghe

Aplicatii ale Cuprului in Metalurgia Pulberilor Editura UNIVERSITARIA, Craiova2009

Tehnologia Materialelor Mutu D., Gheorghe St Reprografia Univ. din Craiova, 2006.

Tehnologia Materialelor. Tehnologii de lucru si aplicatii, S. Sontea s.a Editura Universitaria, Craiova,2000

Subject of study: Advanced production systems in automotive engineering

CODE: D22AED211
NUMBER OF CREDITS: 5
YEAR/SEMESTER: 1st year/2nd semester
TYPE OF COURSE: specialized
OBJECTIVES: Presentation of automotive production strategies and automation levels, flexible manufacturing systems, slim production, Kanban strategy, Six Sigma.
CONTENT: Manufacturing strategy and levels of automation. Design for sustainability in automotive industry. Cellular manufacturing systems. Flexible manufacturing systems. Lean manufacturing. Toyota Production System. Just in time production si sistemul Kanban
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):
Brişan, C., Sisteme Flexibile de Fabricaţie, Ed. UT Pres, ISBN 973-98380-8-1, Cluj-Napoca, 1998.
Ciobanu, L., Sisteme Flexibile de Fabricaţie, Ed. Univ. „Gh. Asachi Iaşi", 2003
Nallan C. Suresh, John M. Kay, Group Technology and Cellular Manufacturing: State-Of-The-Art Synthesis of Research and Practice, 1998 Mikell P. Groover, Automation, Production Systems, and Computer-Integrated Manufacturing, Prentice Hall Press Upper Saddle River, 2007
Michael Peschl, Norbert Link, Michael Hoffmeister, Gil Gonçalves, Fernando L.F. Almeida,
Designing and implementation of an intelligent manufacturing system, Journal of Industrial Engineering and Management, 2011
Benga, G., Stanimir, A. – Tehnologii de Prelucrare şi Montaj, vol.1, Editura Universitaria, Craiova, 2007

Subject of study: Modeling automobiles dynamics

CODE: D22AED212
NUMBER OF CREDITS: 5
YEAR/SEMESTER: 1st year/2nd semester
TYPE OF COURSE: specialized
OBJECTIVES: Presentation of automotive production strategies and automation levels, flexible manufacturing systems, slim production, Kanban strategy, Six Sigma.
CONTENT: Dynamics of the car in Newton's formalism. Forces and moments. Euler's angles. Dynamic car model with one degree of freedom.

The dynamic response of the car model with one degree of freedom. Dynamic car model with two degrees of freedom. The dynamic response of the car model with two degrees of freedom. The general mechanical model of a vehicle used in the study of vehicle vibrations. Vibration study and analysis on the model with one degree of freedom with Simulink / Matlab
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):
Vibraţii mecanice/ Mechanical Vibrations. Aplicaţii la autovehicule rutiere/ Aplications on automobiles, Editura " Universitaria", 2010, 233 pag, ISBN 978-606-510-769-4;
Cota Biblioteca Nationala II 549171;
Vibraţii mecanice/ Mechanical Vibrations. Modelarea şi simularea structurilor mecanice/ Modelling and simulation of the mechanical structures, Editura " Universitaria", 2011, 205 pag, ISBN 978-606-14-0058-4; Cota Biblioteca Nationala II 558993;
Mecanica tehnica/ Technical Mechanics. Teorie si probleme rezolvate/ Theory and solved problems Editura " Sitech", 2015, 216 pag, ISBN 978-606-11-4455-6,
Thomas D. Gillespie, Fundamentals of Vehicle Dynamics, Published by: Society of Automotive Engineers, Inc. 400 Commonwealth Drive Warrendale, PA 15096-0001;
Reza N. Jazar, Vehicle Dynamics: Theory and Applications, Library of Congress Control Number: 2007942198, 2008 Springer Science+Business Media, LLC, ISBN: 978-0-387-74243-4 e-ISBN: 978-0-387-74244-1;
M.Untaru, Gh.Peres, A. Stoicescu, I. Tabacu, Dinamica autovehiculelor pe roti, Editura Didactica si Pedagogica,1981, Bucuresti;

Subject of study: Scientific researche/practice

CODE: D22AED214
Number of credits: 7
Year/Semester:1st year , 2nd semester
Type of Course: mandatory
OBJECTIVES: Developing specific study program abilities by identifying the fundamental and documentary elements related to the analysis of technical norms and research in the field
CONTENT: Scientific research: defining the theoretical, applied, experimental and analytical elements. Classical and modern bibliographic research techniques on a given theme. Drawing up a bibliography; references and footnotes. Choosing the field of research and proposing a theme. Establish the main objectives within the activity. Documentation on the fundamentals of the research-design field chosen. Search engines specific to stintificial research. Identifying important achievements, defining the proposed themes. Scientific report resulting from bibliographic research on a given topic; summary and keywords that characterize the theme; content of ideas, critical analysis, personal opinions, conclusions. Presentation of scientific articles: elaboration of the presentation of the article; estimating the length of the presentation according to the time limits; designing the presentation form; preparation of the

presentation
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):

Belous, V., Plăhteanu, B. Fundamentele creaţiei tehnice. Editura Performantica, Iaşi , 2005

Enăchescu,C. Tratat de teoria cercetării ştiinţifice, Editura Polirom, Iaşi, 2005

Manolea, Gh. Bazele cercetării creative, Editura AGIR, Bucureşti 2006

Subject of study: Functional design optimization of automobiles engines

CODE: D22AED321
NUMBER OF CREDITS: 4
YEAR/SEMESTER: 2nd year/1st semester
TYPE OF COURSE: optional
OBJECTIVES: Presentation to the students of existing principles, methods, models and technical novelties in the field of optimization of internal combustion engines.
CONTENT: Considerations on experimental research in the field of internal combustion engines. Combustion Diagnostic Techniques. Basic principles for pressure measurement. Piezoelectric measuring systems. Variants of assembly. Optical diagnostic techniques. Laser measuring techniques.. Combustion analysis of internal combustion engines. Diesel Engines. Fuel Injection Methods. Formation of the mixture. Combustion analysis of internal combustion engines. Gasoline engines. Structure of the ignition system. The ignition sequence. Propagation of flame after ignition, turbulence effect. Abnormal combustion. Formation of the mixture. The layered injection. New technologies used in internal combustion engines. Variable distribution. Turning off cylinders. Reduction of engines. New types of engines. Engine with variable compression ratio. The Revetec engine. The Huttlin engine. Rotary engine. Duke Motor. Five-stroke engine. Mixing and burning simulation programs. AVL Fire. GT-Power. Ricardo Wave. Lotus Engine Simulations
TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):
Bobescu, Gh., ş.a., Motoare pentru automobile şi tractoare, Volumul I,Teorie şi caracteristici, EdituraTehnică, Chişi-nău, 1996;
Challen, B., Baranescu Rodica, Diesel Engine Reference Book, Butterworth Heinemann, 1999;
Cristea, D., Cai de optimizarea motoarelor cu ardere interna, Editura Universitatii din Pitesti, 2009;
Dumitru I., Metode de optimizare a motoarelor cu aprindere prin comprimare cu injective directe, Craiova, 2009;
Grunwald, B., Teoria, calculul şi construcţia motoarelor pentru autovehicule rutiere, editura Didactică şi Pedagogică, Bucureşti, 1980;
Guzzella, L., Onder, C.H.: Introduction to Modeling and Control of Internal Combustion Engine Systems, Springer, 2004;
Heywood, J. B: Internal Combustion Engine Fundamentals, McGraw-Hill Series in Mechanical Engineering, Library of Congress Cataloging-in-Publication Data, 1988;
Negurescu, N., s.a, Motoare cu aprindere prin scanteie. Procese, Editura Matrix Rom, Bucuresti, 2009;
Popa, M. G., Moteurs a combustion interne, Guide de conception ,Editura Matrix Rom, Bucuresti, 2005;

Tutunea Dragos Dumitru Ilie, Dima Alexandru, Functional design optimization of automobiles engines (in english), 2018, 95 pages.
Tutunea Dragos Dumitru Ilie, Dima Alexandru, Lucrări de laborator Optimizare constructiv - funcţională a motoarelor de automobile, 2018, 116 pagini.

Subject of study: Functional design optimization of automobiles transmissions and systems

CODE: D22AED322
NUMBER OF CREDITS: 4
YEAR/SEMESTER: 2nd year/1st semester
TYPE OF COURSE: optional
OBJECTIVES: Increasing knowledge on modern vehicles transmissions required in design and research, acquiring calculation methods, modeling and design optimization for transmission vehicle's elements.
CONTENT: Introduction to optimization theory; Clasical methods for optimum determination (problems with and without restrictions). Direct search methods for the optimal solution. Programming methods. Topological optimisation. Constructive optimisation for the mechanical clutch, mechanical gearbox, planetary shaft, suspension system, steering system and brake system.

TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):
Curievici, I., Optimizări în industria chimică, Editura Didactică și Pedagogică, București, 1980
Radulescu, O., Popovici, M.M., Proiectarea optimală a organelor de mașini. Teorie și aplicații., Editura Tehnică, 2003
Trotea, M., Simniceanu, L., "Optimizarea constructivă a sistemelor autovehiculelor – lucrări practice", 2013
Trotea, M., "Optimizarea constructivă a transmisiei și a sistemelor autovehiculelor. Note de curs", 2014
Trotea, M., "Optimizarea constructivă a transmisiei autovehiculelor. Lucrări practice", 2015

Subject of study: Design for Safety & Comfort

CODE: D22AED325
NUMBER OF CREDITS: 4
YEAR/SEMESTER: 2nd year/1st semester
TYPE OF COURSE: mandatory
OBJECTIVES: Description of methods to increase safety and comfort in the use of motor vehicles, the formation of general knowledge of the information provided by the mathematical models of automobile dynamics, measurements as well as the experience gained in the field of automotive engineering.
CONTENT: Generalities on ergonomics. Ergonomic principles used in vehicle construction. The role of ergonomic organization in increasing safety and comfort. Movements of the human body and their influence on ergonomic design methods.

In order to increase safety and comfort. Raising safety and comfort levels by focusing on ergonomic principles when designing the cockpit. Mathematical models for the study of vehicle vibrations. Effects of noise and vibrations on human body a. nd activity. How noise and vibration affect safety and comfort. Methods to reduce vibrations in vehicles to increase safety and comfort. Soundproofing and Sound Absorbing Materials. Enhancing safety and comfort when using active noise attenuators and reactive noise attenuators. Functional features of attenuators, constructive solution. Solutions to increase safety and comfort used by prestigious vehicle manufacturers

TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):

Darabont A.,Iorga I., Ciodaru M.,-Masurarea zgomotului si vibratiilor in tehnica, Editura Tehnica Bucuresti ,1983

Darabont A., Costin A., Vaiteanu D.,-Combaterea zgomotului si vibratiilor in tehnica militara, Editura militara ,Bucuresti, 1983

Filip N.,-Zgomotul la autovehicule, Editura Todesco , Cluj Napoca, 2000

Filip N., Cordos N., Rus I.,-Zgomotul urban si traficul rutier, Todesco , Cluj Napoca,2001

SR ISO 9613-1. Acustica. Atenuarea sunetului propagat in aer liber

STAS 6926/15-92. Masurarea zgomotului exterior produs in miscare si in stationar de autovehicule rutiere cu motor.

Hotararea Guvernului 321/2005 (Directiva 2002/49/EC)Bolcu D.- Vibratiile sistemelor cu legaturi liniare, Ed.Sitech, Craiova, 2006

Rizescu S. Structuri spatiael cu elemente composite, Ed. Universitaria, Craiova, 2004

Moldovan M., Ergonomie, E.D.P. Bucuresti, 1993

Carean.M.-Ergonomie-U.T.Cluj Napoca,1999

SR ISO 9613-1. Acustica. Atenuarea sunetului propagat in aer liber

STAS 6926/15-92. Masurarea zgomotului exterior produs in miscare si in stationar de autovehicule rutiere cu motor.

Buculei M. E.., Bolcu D. Controlul zgomotelor si vibratiilor,Indrumar de laborator Reprografia Universitatii din Craiova.

.http://bm-cat.ro/
.http://www.opel.ro/
.http://www.skoda.ro/
.http://www.google.ro/

Sonar Sensing; Range Sensors; 3-D Vision and Recognition; Visual Servoing and Visual Tracking; Multisensor Data Fusion.
Manipulation and Interfaces:
 Motion for Manipulation Tasks; Contact Modeling and Manipulation; Grasping; Cooperative Manipulators; Haptics; Telerobotics.
Mobile Robotics: Motion Control of Mobile Robots; Motion Planning and Obstacle Avoidance;
  World Modeling; Simultaneous Localization and Mapping.
Robotics Applications for Automotive:
Industrial Robotics (Typical Robot Applications, Configurations, Kinematics and Mechanisms, Task Descriptions, Teaching and Programming, End-Effectors, Integration).
Welding Robots in auto manufacturing.
Painting Robots in auto manufacturing.
Robots for material handling applications in auto manufacturing.Robot Programming by Demonstration - Engineering-Oriented.
Intelligent Vehicles (Road Scene Understanding, Advanced Driver AssistanceDriver Monitoring, Automated Vehicles).

TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):

Springer Handbook of Robotics, Editori Bruno Siciliano, Oussama Khatib, Springer-Verlag Berlin Heidelberg 2008.

Robotics, Vision and Control: Fundamental Algorithms in MATLAB (Springer Tracts in Advanced Robotics), Peter Corke, ISBN-13: 978-3642201431, 2013.

Theory of Applied Robotics: Kinematics, Dynamics, and Control, Reza N. Jazar, ISBN-13: 978-1441917492, 2010.

Achizitia, prelucrarea si recunoasterea imaginilor, Dorian Cojocaru, Editura Universitaria, ISBN 973-8043-146-6, 2003.

Fuzy Techniques in Computer Vision, Răzvan Tănasie, Dorian Cojocaru, Editura Universitaria, ISBN 973-742-428-X, 978-973-742-428-0, 2006.

Advanced Strategies For Robot Manipulators, Mircea Ivănescu, Dorian Cojocaru, Chapter: Hyper Redundant Manipulators, ISBN 978-953-307-099-5, 2010.

Hyper-redundants Robots, Dorian Cojocaru, Mircea Ivănescu, Florin Manta, Sorin Dumitru, Răzvan Tănasie, Editura Universitaria, ISBN 978-606-510-980-3, 2010.

Subject of study: Advanced Robotics

CODE: D22AED326
NUMBER OF CREDITS: 6
YEAR/SEMESTER: 2nd year/1st semester
TYPE OF COURSE: mandatory
OBJECTIVES:
CONTENT: Advanced Robot Structures:
Kinematically Redundant Manipulators,
Parallel Mechanisms and Robots;
Robots with Flexible Elements;
Robot Hands;
Sensing and Perception:
Force and Tactile Sensors;
Inertial Sensors, GPS, and Odometry;

Subject of study: Computer assisted automobiles diagnosis

CODE: D22AED327
NUMBER OF CREDITS: 5
YEAR/SEMESTER: 2nd year/1st semester
TYPE OF COURSE: optional
OBJECTIVES: Advanced knowledge in the field of electronic diagnostics of motor vehicles, acquisition of advanced methods and techniques of the onboard and laboratory diagnostics **C**
CONTENT: General principles of vehicle diagnostics. General Diagnostics of Vehicles. agnosis of main vehicle systems. Modern computer assisted diagnostic elements. Self-diagnosis or on-

board diagnosis - equipment and method.
Diagnosis - off-board diagnosis - equipment and method

TEACHING LANGUAGE: English
EVALUATION: Written/oral examination
BIBLIOGRAPHY (selective):

Andreescu, C., ş.a. Diagnosticarea automobilelor, Editura Printech, Bucureşti, 2002

Cristea, D., Sisteme speciale ale automobilelor şi motoarelor, Editura Universităţii din Piteşti, 1999

Dumitru I., Diagnosticarea sistemelor tehnice, Editura Universitaria, Craiova, 2005

Grunwald, B., Teoria, construcţia şi calculul motoarelor pentru autovehicule rutiere, Editura Didactică şi Pedagogică, Bucureşti, 1982

Manea, C., Stratulat, M., Fiabilitatea şi diagnosticarea automobilelor, Editura Militară, Bucureşti, 1982

Oţăt, V., Dumitru, I., Echipamente şi tehnici de diagnosticare a autovehiculelor, Editura Universitaria, 2007

Oţăt, Oana, Dumitru, I., Oţăt, V., Expertiza Tehnică a Accidentului de Circulaţie – Aplicaţii, Universitatea din Craiova, 2014

Rothengatter, T., & Carbonell Vaya, E. (coord.) – Traffic and transport psychology, Pergamon, 1997;

*** Accident Reconstruction – Technology And Animation - VI -SAE SP-1150 –1996.

*** Datentechik, S – PC-CRASH A Simulation Program for Vehicle Accidents, Operating Manual, Version 8.0 - November 2006, Linz, Austria.

*** Traffic Engineering Handbook, Institute of Transportation Engineers (1992). Washington, DC.;

*** Virtual CRASH 2.2 Documentation

*** http://www.esafetysupport.org, http://www.makeroadssafe.org, http://www.inrets.fr

*** http://www.vcrash.com/download/models&shapes.pdf

Subject of study: Scientific research/practice

CODE: D22AED329
Number of credits: 7
Year/Semester: 2nd year , 1st semester
Type of Course: mandatory

Subject of study: Research stage

CODE: D22AED430
Number of credits: 10
Year/Semester: 2nd year , 2nd semester
Type of Course: mandatory

Subject of study: Research for dissertation development

CODE: D22AED431
Number of credits: 20
Year/Semester: 2nd year , 2nd semester
Type of Course: mandatory