DESCRIPTION OF THE COURSE

Name of the course: **Design of Internal Combustion Engines**	Code: **BpAT13**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW) Tutorials (T)	Hours per semester: L – 15 hours T – 10 hours LW – 10 hours	Number of credits: **6**
Course project (CP)	Code: **BpAT14**	Number of credits: **3**

LECTURER(S):
Prof. Eng. Valyo Nikolov, PhD (FMI), tel.: 659594, e-mail: vnikolov@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Bachelor's degree, specialty "Autotransport Machinery", Professional orientation 5.1 Mechanical Engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The students must to know the basics of construction, design and calculations of the internal combustion engines (ICE).

DESCRIPTION OF THE COURSE: Kinematics, dynamics and balance of the ICE. Construction and calculations of the elements Construction and calculation of the housing parts of the ICE. Construction and calculation of the separate units of crank mechanism of ICE. Construction and calculation of the separate units of gas distribution mechanism of ICE.

PREREQUISITES: Mathematics, Physics, Mechanics, Theory of Internal Combustion Engines, Design of Internal Combustion Engines, Theory of Automobile, Design of Automobile and etc.

TEACHING METHODS: Lectures using multimedia, slides and others materials. Laboratory works for which reports are made and the reports are checked by the teacher. The course work contains a strength calculation of the main parts of the ICE.

METHOD OF ASSESSMENT: Written exam at the end of semester.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Димитров П., Учебник по „Теория на двигателите с вътрешно горене", Издателство на Технически Университет – София, 2000; 2. Бояджиев К. и кол., Конструкция, проектиране и изчисляване на ДВГ, Издателство "Техника", София, 1984; 3. Костов В., Николов В., Димитров Е., Амбарев К., Учебник по "Авиационни бутални двигатели", Издателство „Хоризонти", Пловдив, 2014; 4. Генов Г., Костов В., Ръководство за курсово проектиране на ДВГ, Издателство „Техника", София, 1986; 5. Николов В., Амбарев К., Ръководство за курсова работа по „Теория на ДВГ", "Топлинно изчисляване на ДВГ с интерактивна програмна система". Издателство „Хоризонти", Пловдив, 2014.

DESCRIPTION OF THE COURSE

Name of the course: **Transmissions in Automobile**	Code: **BpAT15**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW)/ Tutorials (T) Course work (CW)	Hours per semester: L – 15 hours T – 10 hours LW – 10 hours	Number of credits: **5**

LECTURER(S):
Assist. Prof. Eng. Stiliyana Taneva, PhD (FME), tel.: 659 524, e-mail: s.taneva@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Bachelor's degree, specialty Autotransport Machinery, Professional orientation 5.1 Mechanical Engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: At the end of the course the students must acquire knowledge about the design and constructions for modern transmissions of the automobiles.

DESCRIPTION OF THE COURSE: The main topics concern: Modern mechanical, hydrodynamic and electrical (dust) clutches; Modern mechanical, hydrodynamic, hydrostatic, CVT and electric transmission; Modern transfer boxes with blocked drive and with inter-axle differential; Modern solutions of bevel gear differentials; Modern trends in one and two-flow transmissions of automobiles, and the basic types of automobiles (4x2, 4x4, 6x4, and 6x6). The power loads and the methods for separation the power flows to reduce losses in the transmission of the automobile are explained.

PREREQUISITES: Mechanics I and II, Strength of materials, Engineering Graphics, Machine elements, Theory of Mechanisms and Machines, Theory of Internal Combustion Engines, Theory of Automobile, Design of Automobile.

TEACHING METHODS: Lectures, using slides, laboratories works with protocols.

METHOD OF ASSESSMENT: Course work at end of semester. Exam at end of semester (80%), laboratories (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Кацов Д., Хлебарски Д., Танева С,. Трансмисии на автомобила, Арена Принт, Пловдив, ISBN 978-619-7413-02-1, 2018; 2. Гигов Б. Автоматични трансмисии, Из-во на ТУ-София, 2007; 3. Кацов Д. Проектиране и конструиране на верижни и колесни машини. ТУ-София, Филиал Пловдив, 1997; 4. Димитров Й. Н. и др. Ръководство по проектиране, конструиране и изчисляване на автомобила, трактора и кара, София, "Техника", 1980; 5. Афанасьев Б. А. и др. Проектирование полноприводных колесных машин – учебник для вузов., Москва, изд. "МГТУ им. Н. Э. Баумаиа", 1999; 6. Гришкевич А и др. Проектирование трансмисий автомобилей. Изд. Машиностроение, Москва, 1984; 7. Носов Н.А., и колектив, Расчет и конструирование гусеничных машин. Ленинград, 1972.

DESCRIPTION OF THE COURSE

Name of the course: **Reliability and technical diagnostics of the car**	Code: **BpAT16**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW)/Seminars (S)	Hours per semester: L – 15 hours LW – 10 hours S – 10 hours	Number of credits: **5**

LECTURER(S):
Assoc. Prof. Eng. Silviya Salapateva, PhD (FME), tel.: 032 659 613, e-mail: sisisal@tu-plovdiv.bg,
Assoc. Prof. Eng. Krasimir Ambarev, PhD (FME), tel.: 032 659 618, e-mail: kambarev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory from the curriculum training of students to obtain Bachelor's degree, specialty Autotransport machinery, Professional orientation 5.1 Mechanical engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is for students to study and be able to apply the methods and technical means for making a technical diagnosis; to forecast the residual resource of the motor transport equipment; to determine the type and scope of prophylactic effects. At the end of their training students will know the causes and types of failures in motor vehicles; the parameters that determine the operational reliability of the motor transport equipment; the laws of distribution of random variables and their use in determining the reliability of motor vehicles; the theoretical foundations of technical diagnostics; methods and means of technical diagnostics.

DESCRIPTION OF THE COURSE: The course includes: main points of the theory of reliability; basic concepts and definitions; failures in motor vehicles; laws of distribution of random variables and their use in determining reliability; design, technological and operational factors ensuring the reliability, theoretical foundations and technology of diagnostics, automated systems for technical diagnostics of motor vehicles.

PREREQUISITES: Car construction, Construction of internal combustion engines, Mathematics - statistics, probability theory.

TEACHING METHODS: The lectures are conducted with the help of presentation and demonstration materials, during the laboratory and seminar exercises the students analyze the type of failures and the degree of wear of basic details of the motor transport equipment, determine the operational reliability, and get acquainted with the practical application of technical diagnostic methods.

METHOD OF ASSESSMENT: Written exam at the end of the semester (80%), Laboratory work and Seminars (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Красовский В. Н., А. С. Кузнецов, В. А. Корчагин, Основы теории надежности и техническая диагностика, Издательство: ТюмГНГУ, Тюмень, 2012; 2. Бояршинов А.Л., В.А. Стуканов, Надежность и техническая диагностика автотранспортных средств - учебное пособие, Издательство: Инфра-М, Москва, 2017; 3. Малкин В. С. , Техническая диагностика - Учебное пособие, Издательство: Лань, 2015 г.; 4. Кирпатенко А.В., Диагностика технического состояния машин, Издательство: УМЦ ЖДТ, 2017.

DESCRIPTION OF THE COURSE

Name of the course: **Systems of Internal Combustion Engines**	Code: **BpAT17**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 15 hours	Number of credits: **5**

LECTURER(S):

Assoc. Prof. Eng. Krasimir Ambarev, PhD (FME), tel.: 032 659 575,
e-mail: kambarev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Bachelor's degree, specialty Autotransport Machinery, Professional orientation 5.1. Mechanical Engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: At the end of the course the students are expected to be able to know topics related to systems of the internal combustion engines, their main indicators and characteristics, as well as the calculations related to them.

DESCRIPTION OF THE COURSE: Main topics: Fuel systems for petrol, diesel and gas internal combustion engines. Engine cooling systems. Engine lubrication systems. Ignition and starting systems of internal combustion engines. Process control systems in internal combustion engines. Emissions control system.

PREREQUISITES: Chemistry, Fluid Mechanics, hydro and pneumatic drive, Theory of Internal Combustion Engines, Design of Internal Combustion Engines and etc

TEACHING METHODS: Lectures using multimedia, slides and others materials. Laboratory works for which reports are made and the reports are checked by the teacher.

METHOD OF ASSESSMENT: Written exam at the end of semester

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Бояджиев, К. Г и кол., Конструкция, проектиране и изчисляване на ДВГ, Издателство "Техника", София, 1984; 2. Димитров А., Русев Р., Леки автомобили. Запалителни уредби, Издателство "Техника", София, 2000;3. Димитров, П. И., Електрически и електронни системи на двигателите с вътрешно горене, Технически Университет – София, 1999; 4. Димитров, П. И., Системи за управление на процесите в ДВГ (Първа част – двигатели с принудително възпламеняване на горивната смес), София, 2014 г.; 5. Димитров, П. И., Системи за управление на процесите в ДВГ (Втора част – двигатели със самовъзпламеняване на горивната смес), София, 2015 г.; 6. Иванов З., Димитров А., Автомобилни газови уредби, Издателство "Техника", София, 2009; 7. Илиев Л.А., Костов В.К., Димитър, И. П. Горивни уредби и автоматично регулиране на ДВГ, Издателство "Техника", София, 1985

DESCRIPTION OF THE COURSE

Name of the course: **Advanced electronic systems in the vehicle**	Code: **BpAT18**	Semester: **7**
Type of teaching: Lectures(L) Laboratory work (LW)/Tutorials (T)	Hours per semester: L – 15 hours T– 10 hours LW – 10 hours	Number of credits: **6**

LECTURER(S):
Assist. Prof. Eng. Ivan Maradzhiev, PhD (FEA), tel.: 032 659 776, e-mail: iv_mar@tu-plovdiv.bg
Technical University of Sofia, branch Plovdiv

COURSE STATUS IN THE CURRICULUM: Compulsory course for students of educational-qualification degree "Bachelor" in part-time form of study in specialty "Autotransport Machinery", professional field 5.1 Mechanical engineering, 5. Technical sciences.

AIMS AND OBJECTIVES OF THE COURSE The aim of the course is to provide students with knowledge of the principles of operation, algorithms of operation, structure and characteristics of electronic devices and systems used in modern vehicles.

DESCRIPTION OF THE COURSE The Advanced electronic systems in the vehicle course focuses on learning and becoming familiar with the systems engineering approach. The topics covered contain: Definition and operating conditions. Structure of vehicle electronic systems. Primary transducers and actuators in the vehicle. Electronic control systems for gasoline and diesel engines. Electronic systems in electric and hybrid vehicles. Electronic control systems for transmission, chassis and steering. Electronic vehicle control systems for headlights and air conditioning. Alarm systems and immobilizers. Passive and active safety systems. Information multiplexing systems (CAN bus). Diagnostics of electronic systems in traffic engineering.

PREREQUISITIES: The basic knowledge acquired from the Electrical and Electronic Engineering, Mathematics, Physics and Chemistry courses is required.

TEACHING METHODS: Lectures delivered using slides and demo programs. Laboratory exercises with methodological guides and laboratory stands and models.

METHOD OF ASSESSMENT: Achievement of the set learning objective of the course is monitored by a final grade, which is the sum of the grades of two written control papers during the semester (80% total) and the grade of the laboratory exercises during the semester (20%).

INSTRUCTION LANGUAGE: Bulgarian.

BIBLIOGRAPHY: 1. Denton T., Automobile electrical and electronic systems. Third edition, ISBN 0 7506 62190, 2004, 2. Moris A. Measurement and instrumentation. Priciples. ISBN 0750650818 2001, 3. Webster J.G, The measurment instrmentation and sensors. CRCPress LLC1999 ISBN084932145-X, 4. Solomon S. Sensors. Handbook M.G.Hill 2010 .ISBN9780071605717, 5. Abdulla M., E. Steinmetz, H. Wymeersch, Self-Driving Vehicles: The Path Forward with LIDAR and V2x Technologies, IEEE Montréal Seminar at McGill U, 2017, 6. Audi Service, ESP – Electronic Stability Programme. Design and function, Self – Study Programme No. 204, VOLKSWAGEN AG, Wolfsburg, 7. Automated and autonomous driving: regulation under uncertainty. International transport forum - © oecd/itf 2015

DESCRIPTION OF THE COURSE

Name of the course: **Sport**	Code: **FaSPR07**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW)/Tutorials (T) Course work (CW) Self-Study (SS)	Hours per semester: L – 0 hours T – 0 hours LW – 0 hours SS – 30 hours	Number of credits: **1**
Course project (CP)	Code: -	Number of credits: **0**

LECTURER(S):

Sen. Lect. Daniel Vladimdirov, PhD (FEA), Tel.: 032 659 646, E-mail: danielv@tu-plovdiv.bg,

Sen. Lect. Petar Doganov, PhD (FEA), E-mail: pdoganov@tu-plovdiv.bg,

Sen. Lect. Boris Spasov, PhD (FEA), E-mail: boris_spassov@tu-plovdiv.bg

Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Facultative subject from the curriculum / curricula for training of students to obtain Bachelor's degree, specialty „Mechanical and Instrument Engineering“, „Mechatronics“, „Mechanical engineering and technologies“, „Autotransport machinery“, Professional orientation 5.1 Mechanical engineering, Professional field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: Targeted at further developing of students' physical activities, skills and hygiene habits through effective methods of physical education, improving their mental and physical performance.

DESCRIPTION OF THE COURSE: The knowledge and skills in Physical Education and Sports develop a wide range of motor skills and habits, help the hardening of the body and contribute to the moral development of students. The enhancement of physical skills is carried out through: 1. General Physical Preparedness – in these seminars the students develop a wide range of motor skill and habits; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience. 2. Sports-Specific Physical Preparedness – students improve their sport skills and habits in a specific sport and gain experience through participation in competitions; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience.

PREREQUISITES: The curriculum presumes the minimum of knowledge and skills acquired at secondary school.

TEACHING METHODS: Seminars in accordance with the curriculum in PE and Sport.

METHOD OF ASSESSMENT: Evaluation is based on functional tests at the end of semester. Lecturer's signature is required at the end of semester and "Pass grade.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Владимиров В. Туризъм и ориентиране. Методическо ръководство за студентите от ТУ София, филиал Пловдив. Издателство на ТУ - София. 2010.

DESCRIPTION OF THE COURSE

Name of the course: **Vehicle maintenance and repair**	Code: **BpAT19**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 10 hours LW – 10 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Silviya Salapateva, PhD (FME), tel.: 032 659 613, e-mail: sisisal@tu-plovdiv.bg
Assist. Prof. Eng. Yordan Stoyanov, PhD (FME), tel.: 032 659626, e-mail: yordan.stoyanov@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Bachelor's degree, specialty "Autotransport Machinery", Professional orientation 5.1 Mechanical Engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The course purpose for students to gain knowledge about the characteristic failures and malfunctions and methods and means for vehicle maintenance and repair.

DESCRIPTION OF THE COURSE: Course "Vehicle maintenance and repair" deepens the students' knowledge of the methods, technological equipment, organization and management of the service and repair of the car.

PREREQUISITES: Basic knowledge of probability theory and car construction is required

TEACHING METHODS: Lectures delivered with the help of visual materials, transparencies, boards and slides. Laboratory exercises performed according to lab. manual and protocols developed by the students and checked by the lecturer.

METHOD OF ASSESSMENT: Exam

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
P. Kolesnik and others. - "Technical maintenance and repair of cars" - Moscow, "Transport", 1985; N.H. Govorushchenko - "Technical operation of cars" - Kharkiv, "V. school", 1984; Shadrichev - "Fundamentals of automotive technology and car repair" - Sofia, "Tehnika", 1981; B. Pronev - "Operation and repair of DVG" - notes, VMEI-Varna, 1979; B. Gachev, M. Zhekov. Operation, service and repair of the car. Sofia, 1957; G. Johnev, L. Stanev. Technical operation of the car. TU - Sofia, 2004

DESCRIPTION OF THE COURSE

Name of the course: **Management and Marketing**	Code: **BpAT20**	Semester: **8**
Type of teaching: Lectures (L) Seminar work (SW)	Hours per semester: L – 10 hours SW – 10 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Nikolay Katrandzhiev, PhD - telephone: 659 715,
email:nkatrandzhiev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory from the curriculum training of students to obtain Bachelor's degree, specialty Autotransport machinery, Professional orientation 5.1 Mechanical engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The course aims to introduce students to the essence and basic elements of management and marketing, with an emphasis on their essence and application in the field of road transport, as well as to develop practical skills in the management and marketing of a road transport enterprise.

DESCRIPTION OF THE COURSE: Transport enterprise, Transport system and transport policy, Business environment of the transport enterprise, Essence and features of transport production, Essence and content of commercial operation of transport, Transport assets. Characteristic features, content and classifications, Transport costs, cost price and prices of transport production, Efficiency of transport activity and methods for economic assessment of investments, Personnel, salary and qualification of personnel in the transport enterprise, Essence of management, Management goals and goal setting, Management of the road transport enterprise, Essence of marketing, markets and sales. Marketing in transport..

PREREQUISITES: Theory of Automobile, Automotive expertise, Technology and Organization of Road Transport.

TEACHING METHODS: Lectures with presentations, case studies, business games and laboratory.

METHOD OF ASSESSMENT: One one-hour written test in the middle of the semester (20%) and an exam test during the exam session (80%)

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Христина Николова, Организация на транспортната дейност и търговска експлоатация в транспорта, Изд. УНСС ISBN 9789546441416, 2. Илиев И., Д. Дончев, М. Велев, Икономика и мениджмънт, изд. Мартилен, 2008 г. 3. Кузманов Г., Маркетинг, изд. EVIC, 2002., 4. Buell V., Marketing Management – a strategic Planning Approash, McGraw-Hill, Inc., 1984.

DESCRIPTION OF THE COURSE

Name of the course: **Ecology and Technical Safety**	Code: **BpAT21**	Semester: 8
Type of teaching: Lectures (L) Laboratory work (LW)/Seminars (S)	Hours per semester: L – 10 hours S –0 hours LW –10 hours	Number of credits: 4

LECTURER(S):
Assoc. Prof. Eng. Stanimir Stefanov, PhD (FEA), tel.: 032659512, e-mail: glasst@tu-plovdiv.bg
Assoc. prof. eng. Marin Genchev, PhD, tel.: 032659512, email: marin2g@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for distance training of students to obtain Bachelor's degree, specialty „Autotransport Machinery“, Professional orientation 5.1. Mechanical engineering, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to familiarize students with standardized and practical permissible values and parameters of harmful and hazardous impacts, the methods for their monitoring, and protective measures. In the "Ecology" section, students are introduced to issues related to environmental pollution, the fundamental concepts and categories in ecology, and the state of nature.

DESCRIPTION OF THE COURSE: The study of this discipline enhances students' knowledge in the field of technical safety. The course aids students in their preparation to master the methodological foundations for achieving and maintaining healthy and safe working conditions.

PREREQUISITES: The course of lectures and exercises is based on students' knowledge of "Physics," "Mathematics," and "Chemistry.".

TEACHING METHODS: Lectures, using slides, case studies, laboratory work whit protocols and defence.

METHOD OF ASSESSMENT: Written exam at the end of the semester.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Генчев М. Кирчев В. , Техническа безопасност и екозащита, ISBN 978-954-2937-08-1 , ТУ София, филиал Пловдив, 2011; 2. Вълчев М, Иванов И. Охрана на труда и околната среда. С. Техника, 1984; 3. Вълчев М. Охрана на труда. С. Техника 1990; 4. Анев Т. и колектив. Вредни въздействия на електричеството и защита от тях С. Техника, 1987; 5. Наредба № РД-07-2 от 16 декември 2009 г. за условията и реда за провеждането на периодично обучение и инструктаж на работниците и служителите по правилата за осигуряване на здравословни и безопасни условия на труд, МТСП, Обн. ДВ. бр. 102 от 22.12.2009 г., попр. ДВ. бр. 4 от 15.01.2010 г., изм. ДВ. бр. 25 от 30.03.2010 г.; 6. Правилник за безопасност и здраве при работа в електрически уредби на електрически и топлофикационни централи и по електрически мрежи, МЕЕР, Обн. ДВ. бр. 34 от 27.10.2004 г., изм. ДВ. бр. 19 от 01.03.2005 г., изм. и доп. ДВ. бр. 92 от 22.10.2013 г...

DESCRIPTION OF THE COURSE

Name of the course: **Combustion Engines Diagnosis**	Code: **BpAT22.1**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 10 hours LW – 10 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Krasimir Ambarev, PhD (FME),, tel.: 032 659 575,
e-mail: kambarev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Optional subject from the curriculum for training of students to obtain Bachelor's degree, specialty Autotransport Machinery, Professional orientation 5.1. Mechanical engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The students must to know about: the various on-board diagnostic systems (OBD) for internal combustion engines, the different types of diagnostic protocols, the components of the data buses, the fault codes, the various objects of the on-board diagnostic system.

DESCRIPTION OF THE COURSE: Main topics: On-board diagnostic systems (OBD) for internal combustion engines. Fault codes. Diagnostics of the internal combustion engine control system. Diagnosis of the three-component catalytic converter. Exhaust gas recirculation system diagnostics. Diagnostics of the air supply system in the exhaust system. Diagnostics of the fuel vapor recirculation system from the tank. CAN bus diagnostics. On-board diagnostic systems for diesel engines.

PREREQUISITES: Electrical Engineering and Electronics, Electrical equipment in transport, Theory of Internal Combustion Engines, Design of Internal Combustion Engines, Systems of Internal Combustion Engines and etc.

TEACHING METHODS: Lectures using multimedia, slides and others materials. Laboratory works for which reports are made and the reports are checked by the teacher.

METHOD OF ASSESSMENT: Written exam at the end of semester

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Гюнтер Г. Диагностика дизельных двигателей, Москва: ЗАО "КЖИ "За Рулем", 2004, 2. Димитров, П. И., Системи за управление на процесите в ДВГ (Първа част – двигатели с принудително възпламеняване на горивната смес), София, 2014 г.; 3. Димитров, П. И., Системи за управление на процесите в ДВГ (Втора част – двигатели със самовъзпламеняване на горивната смес), София, 2015 г.4. Робърт Бош, Системи за управление на дизелови двигатели, издателство "Консулт - Лозанов", 2011 г. , 5. Рокош У., Бортовая диагностика, издателство „За рулем“, 2013., 6. Тюнин А.А. Диагностика электронных систем управления двигателей легковых автомобилей, Практическое пособие, Москва: Солон-Пресс, 2007.

DESCRIPTION OF THE COURSE

Name of the course: **Automobile diagnostics**	Code: **BpAT22.2**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 10 hours LW – 10 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Krasimir Ambarev, PhD (FME),, tel.: 032 659 575,
e-mail: kambarev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Optional subject from the curriculum for training of students to obtain Bachelor's degree, specialty Autotransport Machinery, Professional orientation 5.1 Mechanical engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of the training in "Testing of automobile" is to deepen students' knowledge in the field of methods, tools and standards for testing automotive machinery. They will allow them to quickly and competently solve issues related to the planning and the realization of the engineering experiment in testing both components and mechanisms of automotive machinery.

DESCRIPTION OF THE COURSE: Topics directly related to the functional properties of the automobile and its components, as well as those affecting its structural reliability, are considered. Students gain knowledge in planning and realization of engineering experiments in testing of automotive machinery.

PREREQUISITES: Basic knowledge of Mathematics, Mechanics, Strength of Materials, Theory of the Internal Combustion Engines, Design of Internal Combustion Engines, Theory of Automobile and Construction of Automobile and etc.

TEACHING METHODS: Lectures using multimedia, slides and others materials. Laboratory works for which reports are made and the reports are checked by the teacher.

METHOD OF ASSESSMENT: Written exam at the end of semester

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Симеонов Е. Ц., Трайков Б. В. Ръководство за лабораторни упражнения по "Надежност, диагностика и поддържане на автотранспортни средства", София, Печатна база на ТУ-София, 1990 г. 2. Крамаренко Г. В. Техническая эксплуатация автомобилей, Москва, Транспорт, 1983 г. 3. Димитров П. И. Диагностика на ДВГ, София, Печатна база на ТУ-София, 1987 г. 4. Димитров П. И. Ръководство за лабораорни упражнения по "Диагностика на ДВГ", София, Печатна база на ТУ-София, 1997 г. 5. Сестримски Д. Г. "Диагностика на автомобила", София, Техника, 1983 г. 6. Denton T., Advanced Automotive Fault Diagnosis Third Edition 2012, Routledge..

DESCRIPTION OF THE COURSE

Name of the course: **CAD in development of internal combustion engines**	Code: **BpAT23.1**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 10 hours LW – 10 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Krasimir Ambarev, PhD (FME), тел.: 032 659 575, e-mail: kambarev@tu-plovdiv.bg
Assist. Prof. Eng. Stanimir Penchev, PhD (FME), tel.: 659632, e-mail: spenchev@tu-plovdiv.bg
Assist. Prof. Eng. Stiliyana Taneva, PhD (FME), tel.: 659524, e-mail: s.taneva@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Bachelor's degree, specialty Autotransport Machinery, Professional orientation 5.1 Mechanical Engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to make the students familiar with the modern CAD systems. Acquisition of knowledge and skills related to the design and development of structural components and assemblies for internal combustion engines: three-dimensional modeling; preparation of technical documentation.

DESCRIPTION OF THE COURSE: The main topics concern: Geometric modelling and part design using the 3D models; Creating and editing assemblies, links between components, libraries of standard elements; Structure of the CAD system; Algorithm for solving engineering problems, data structures and organization in CAD systems.

PREREQUISITES: Engineering Graphics, Machine Elements, Theory of Machines and Mechanisms, Theory of for internal combustion engines, Construction of for internal combustion engines, Systems of for internal combustion engines

TEACHING METHODS: Lectures, using slides, case studies, laboratory and course work, work in teams, protocols

METHOD OF ASSESSMENT: Written exam (80%), laboratories (20%)

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Лазов, Л. Приложение на CAD в машиностроенето, Издателство на ТУ – София, 2004. 2. Hirz, M., Dietrich, W, Gfrerrer, A., Lang, J. Integrated Computer-Aided Design in Automotive Development, Springer, 2013, ISBN 978-3-642-11939-2. 3. William E. Howard, Joseph C. Musto, Introduction to Solid Modeling Using SOLIDWORKS 2018, Copyright © 2019 by McGraw-Hill Education.

DESCRIPTION OF THE COURSE

Name of the course: **CAD in automotive development**	Code: **BpAT23.2**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 10 hours LW – 10 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Krasimir Ambarev, PhD (FME), тел.: 032 659 575, e-mail: kambarev@tu-plovdiv.bg
Assist. Prof. Eng. Stanimir Penchev, PhD (FME), tel.: 659632, e-mail: spenchev@tu-plovdiv.bg
Assist. Prof. Eng. Stiliyana Taneva, PhD (FME), tel.: 659524, e-mail: s.taneva@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Bachelor's degree, specialty Autotransport Machinery, Professional orientation 5.1 Mechanical Engineering, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim aim of the course is to make the students familiar with the modern CAD systems. Acquisition of knowledge and skills related to the design and development of structural components and assemblies for vehicles and equipment: three-dimensional modeling; preparation of technical documentation.

DESCRIPTION OF THE COURSE: The main topics concern: Geometric modelling and part design using the 3D models; Creating and editing assemblies, links between components, libraries of standard elements; Structure of the CAD system; Algorithm for solving engineering problems, data structures and organization in CAD systems.

PREREQUISITES: Engineering Graphics, Machine Elements, Theory of Machines and Mechanisms, Theory of Automobile, Construction of Automobile

TEACHING METHODS: Lectures, using slides, case studies, laboratory and course work, work in teams, protocols

METHOD OF ASSESSMENT: Written exam (80%), laboratories (20%)

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Лазов, Л. Приложение на CAD в машиностроенето, Издателство на ТУ – София, 2004. 2. Hirz, M., Dietrich, W, Gfrerrer, A., Lang, J. Integrated Computer-Aided Design in Automotive Development, Springer, 2013, ISBN 978-3-642-11939-2. 3. William E. Howard, Joseph C. Musto, Introduction to Solid Modeling Using SOLIDWORKS 2018, Copyright © 2019 by McGraw-Hill Education.

DESCRIPTION OF THE COURSE

Name of the course: **Sport**	Code: **FaSPR08**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)/Tutorials (T) Course work (CW) Self-Study (SS)	Hours per semester: L – 0 hours T – 0 hours LW – 0 hours SS – 30 hours	Number of credits: **1**
Course project (CP)	Code: -	Number of credits: **0**

LECTURER(S):

Sen. Lect. Daniel Vladimdirov, PhD (FEA), Tel.: 032 659 646, E-mail: danielv@tu-plovdiv.bg,

Sen. Lect. Petar Doganov, PhD (FEA), E-mail: pdoganov@tu-plovdiv.bg,

Sen. Lect. Boris Spasov, PhD (FEA), E-mail: boris_spassov@tu-plovdiv.bg

Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Facultative subject from the curriculum / curricula for training of students to obtain Bachelor's degree, specialty „Mechanical and Instrument Engineering“, „Mechatronics“, „Mechanical engineering and technologies“, „Autotransport machinery“, Professional orientation 5.1 Mechanical engineering, Professional field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: Targeted at further developing of students' physical activities, skills and hygiene habits through effective methods of physical education, improving their mental and physical performance.

DESCRIPTION OF THE COURSE: The knowledge and skills in Physical Education and Sports develop a wide range of motor skills and habits, help the hardening of the body and contribute to the moral development of students. The enhancement of physical skills is carried out through: 1. General Physical Preparedness – in these seminars the students develop a wide range of motor skill and habits; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience. 2. Sports-Specific Physical Preparedness – students improve their sport skills and habits in a specific sport and gain experience through participation in competitions; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience.

PREREQUISITES: The curriculum presumes the minimum of knowledge and skills acquired at secondary school.

TEACHING METHODS: Seminars in accordance with the curriculum in PE and Sport.

METHOD OF ASSESSMENT: Evaluation is based on functional tests at the end of semester. Lecturer's signature is required at the end of semester and "Pass grade.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Владимиров В. Туризъм и ориентиране. Методическо ръководство за студентите от ТУ София, филиал Пловдив. Издателство на ТУ - София. 2010.