DESCRIPTION OF THE COURSE

Name of the course: **Railway tractive rolling stock**	Code: **BpTMT15**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 30 hours	Number of credits: **5**
Course project (CP)	Code: **BpTMT21**	Number of credits: **3**

LECTURER(S):
Assoc. Prof. Eng. Svetoslav Slavchev, PhD (FT), tel.: 965 2932, e-mail: slavchev_s_s @tu-sofia.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 Transport Machinery and Technologies, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of this subject is to give the students wide knowledge about design and principles of operating of the locomotives, which is useful to the engineer experience. This subject also presents to the students specific features of these railway vehicles with their modern scheme solutions and the typical design of their units and with the trends of their development.

DESCRIPTION OF THE COURSE: The main topics concern: That subject is dedicated to the fleet of the locomotives in Bulgaria and trams and multiple units for the underground transport (Metro system) in order to help for faster adaptation of the bachelors in every type of railway companies. The trends and perspectives of the modern locomotive building in the world and high-speed railway transport are described in this subject. There is a student project in the frame of this course.

PREREQUISITES: Knowledge of the fundamental subjects included in the syllabus of the Transport Machinery and Technologies speciality is essential.

TEACHING METHODS: Lectures given with the aid of supporting materials, posters, slides and multimedia. Laboratory work, carried out as per the laboratory manual and laboratory work reports, prepared by the students and checked by the lecturer.

METHOD OF ASSESSMENT: Written exam at the end of 7th semester.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Кръстев, О., К. Велков. Тягов релсов състав, С., ТУ - София, 2014. 2. Кръстев, О. Албум по дисциплината "ЖПТ-II" – учебно помагало, С., ТУ - София, 2008/2019. 3. Кръстев, О. Презентации на лекциите. 4. Велков, К., О. Кръстев. Ръководство за курсово проектиране С., ТУ - София, 2009. 5. Ружеков, Т., и др.. Конструкция, теория и проектиране на локомотиви. С., ВМЕИ, 1987, 561 с. 6. Илиев, Б. Д. Йовчев, О. Кръстев. Механична част и спомагателни системи на дизеловите локомотиви. С., ВВТУ, 1993. 7. Илиев, Б. и др. Предавателни системи на дизеловите локомотиви. С., Техника, 1981. 8. Българанов, Л. Електрически транспорт. С., ТУ-София, 1991.

DESCRIPTION OF THE COURSE

Name of the course: **Systems of Internal Combustion Engines**	Code: **BpTMT16**	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 Transport Machinery and Technologies, Professional orientation 5.5 Transport, Navigation and Aviation, 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, 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: **Automotive Transmissions**	Code: **BpTMT17**	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):
Assist. Prof. Eng. Stiliyana Taneva, PhD (FME), tel.: 032 659 524, 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 Transport Machinery and Technologies, Professional orientation 5.5 Transport, Navigation and Aviation, 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, Strength of materials, Engineering Graphics, Machine elements, Theory of Machines and Mechanisms, Theory of Internal Combustion Engines, Theory of Automobile, Construction of Automobile..

TEACHING METHODS: Lectures, using slides, laboratory work with protocols..

METHOD OF ASSESSMENT: Exam at end of semester (80%), laboratory works (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: **Technologies and Equipment for Train Controlling**	Code: **BpTMT18**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Svetoslav Slavchev, PhD (FT), tel.: 965 2932, e-mail: slavchev_s_s @tu-sofia.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 Transport Machinery and Technologies, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The main aim of this subject is to give the students' knowledge about basic theoretical points in the area of train controlling and about design and theoretical features of the brake systems and brake technologies.

DESCRIPTION OF THE COURSE: The main topics concern: This course is dedicated to the basic methods of the trains resistance calculating, ways for the trains weight calculating and the methods of the defining the dependence between speed of the train and its gone distance. The ways of computing the brake distance are also described in this course.

PREREQUISITES: Basic knowledge of fundamental and special courses from curriculum of the specialty "Transport Machinery and Technology".

TEACHING METHODS: Lectures given with the aid of supporting materials, posters, slides and multimedia. Laboratory work, carried out as per the laboratory manual and laboratory work reports, prepared by the students and checked by the lecturer.

METHOD OF ASSESSMENT: The assessment is formed by the result form written test in the end of the semester (80%) and with enters tests of the labs (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Велков К., О. Кръстев. Технологии и системи за управление на влаковете. София, ТУ – София, 2111. 2. Деев, В., Г. Ильин, Г. Афонин. Тяга поездов. М., Транспорт, 1987. 3. Ненов Н Движение на влаковете и оптимални режими на управление.София, ВТУ, 2008. 4. Тонев, С. Основи на теорията, изчисленията и експлоатацията на спирачните системи на подвижния железопътен състав.С., ВТУ, 1993. 5. Розенфельд, В. Е., И. П. Исаев, Н. Н. Сидеров. Теория электрической тяги. М., Транспорт, 1983. 6. Basics of Brake Technology. München, KNORR-BREMSE, 2003.

DESCRIPTION OF THE COURSE

Name of the course: **Maintenance and repair of transport machinery**	Code: **BpTMT19**	Semester: **7**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Silviya Salapateva, PhD (FME), tel.: 032 659613, e-mail: sisisal@tu-plovdiv.bg
Assist. Prof. Eng. Yordan Stoyanov, PhD (FME), tel.: 032 659626, e-mail: yordan.stoyanov@tu-plovdiv.bg
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COURSE STATUS IN THE CURRICULUM: Compulsory study from the curriculum training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences

AIMS AND OBJECTIVES OF THE COURSE: The course purpose for students to gain knowledge about typical failures and malfunctions and methods and means of maintaining and repairing transport equipment

DESCRIPTION OF THE COURSE: The discipline "Maintenance and repair of transport machinery" deepens students' knowledge of methods, technological equipment, organization and management of maintenance and repair of transport equipment.

PREREQUISITES: Basic knowledge of Mathematics and Construction of Automobile 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: Yordanova S., E. Gadjeva. System Modeling and Simulation. Technical University of Sofia, Sofia, 2019, 143, ISBN 954-438-350-6; 2. MATLAB with SIMULINK, User's Guide. The Math Works Inc., 2012; 3. Chisman J. Introduction to Simulation Modeling using GPSS/PC. Prentice Hall, 2015. ISBN 0-13-473695-8.

DESCRIPTION OF THE COURSE

Name of the course: **Hydraulic and Pneumatic Machines and Fluid Power Systems**	Code: **BpTMT20**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Atanas Nachev, PhD (FME), tel.: 032 659 514, e-mail: anachev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory study from the curriculum training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The main purpose of the subject "Hydraulic and pneumatic actuation" is to provide to the student's necessary knowledge on the main issues of the construction solutions, calculation methods, designing and operation of hydraulic and pneumatic machines, elements and main types of actuating systems, used in automotive engineering.

DESCRIPTION OF THE COURSE: The main topics concern: Main course themes are divided in the two directions: first direction – specification, construction, mode of operation and characteristics of dynamic and positive displacement hydraulic and pneumatic machines. Second direction of themes – cover valves and other elements, used in hydraulic and pneumatic actuating systems and the main types of those type systems.

PREREQUISITES: Physics, Information and Communication Technologies, Electrical Engineering and Electronics, Fluid mechanics, Thermodynamics and Heat Transfer 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: Two one-hour assessments at mid and end of semester (80 %), laboratories (20 %).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Грозев Г., С. Стоянов, Г. Гужгулов, Хидро- и пневмомашини и задвижвания, Издателство „Техника", София, 1990; 2. Комитовски М., Елементи на хидро- и пневмозадвижването, Издателство „Техника", София, 1985; 3. Москов Н., Лазаров С., Ръководство за лабораторни упражнения по хидро- и пневмо задвижване и управление. Издателство „Техника", София, 1986; 4. Akers A., Gassman M., Smith R, Hydraulic Power System Analysis, Taylor & Francis, NY, 2006.

DESCRIPTION OF THE COURSE

Name of the course: **Sport**	Code: **FaSPR07**	Semester: **7**
Type of teaching: Self-Study (SS)	Hours per semester: SS – 30 hours	Number of credits: **1**

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

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COURSE STATUS IN THE CURRICULUM: Facultative subject from the curricula for training of students to obtain Bachelor's degree, specialties „Mechanical Engineering and Instrumentation“, „Mechatronics“, „Computer Modelling and Mechanical Engineering“, Professional orientation 5.1 Mechanical engineering; specialties „Transport Machinery and Technology“, „Aeronautical Engineering” Professional orientation“ 5.5 Transport, Navigation and Aviation, specialties „Intelligent systems and artificial intelligence“, „Industrial Management“, “Graphic Design and Printing“, Professional qualification 5.13 General 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: **Traffic safety**	Code: **BpTMT22**	Semester: **8**
Type of teaching: Lectures (L) Tutorials (T)	Hours per semester: L – 30 hours T – 20 hours	Number of credits: **4**

LECTURER(S):
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 study from the curriculum training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The course purpose in "Traffic Safety" is to train students in the theory and practical measures to ensure the safety of road traffic.

DESCRIPTION OF THE COURSE: The requirements, methods, measures, and constructive solutions ensuring traffic safety and reducing the harmful effects of road transport are studied. The studied questions are in the scientific fields: psychophysiology of the driver's work, structural safety of the modern car, the road and its facilities, theory of transport flows, organization, regulation and management of transport and pedestrian flows, automated traffic control systems.

PREREQUISITES: Basic knowledge of mathematics, physics, mechanics, internal combustion engines, theory and construction of automobile, technology and organization of road transport, etc. is required.

TEACHING METHODS: Lectures delivered with the help of visual materials, boards, slides and videos. Coursework for presentation of appropriate measures to increase traffic safety for specific road sections.

METHOD OF ASSESSMENT: Exam.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: I. Zlatanov. Traffic organization and safety. Technika Sofia. 1985; R. Bayett, R. Watts. Investigation of traffic accidents. Technique. Sofia. 1988; D. Semov, N. Ivanov, D. Lozanov. Cars, tractors and trucks. Technique. Sofia. 1992; A. Pavlov, V. Panchev, H. Zapryanov, H. Bonev, L. Hristov. Safe road traffic. Technique. Sofia. 1991; D. Lyubenov, S. Kostadinov. Traffic safety - manual for exercises, Printing base at RU "A. Kanchev", 2015; Zh. Gelkov, D. Lyubenov. Traffic safety, Printing base at RU "A. Kanchev", 2014; D. Simeonov, V. Pencheva. Interaction of the types of transport, Printing base at RU "A. Kanchev", Ruse, 2001, p. 308.

DESCRIPTION OF THE COURSE

Name of the course: **Loading and unloading processes**	Code: **BpTMT23**	Semester: **8**
Type of teaching: Lectures (L) Tutorials (T)	Hours per semester: L – 30 hours T – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Silviya Salapateva, PhD (FME), tel.: 032 659613, e-mail: sisisal@tu-plovdiv.bg
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Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory study from the curriculum training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of the "Loading and Unloading Processes" training is to train students to apply their knowledge to work with palletized and non-palletized loads. Correct application of handling and transport handling processes in transport and logistics. To know the work with cargo carts, carts and different types of cranes for handling cargo and cargo units

DESCRIPTION OF THE COURSE: They study main topics: Manipulation and transport-manipulation processes in transport. Carrie. Bridge, gantry, cable and bridge cable cranes. Transporters. Working with pallets and containers. Boom cranes.

PREREQUISITES: Basic knowledge of mathematics, physics, mechanics, technology and organization of road transport, etc. is required.

TEACHING METHODS: Lectures delivered with the help of visual materials, boards, slides and videos.

METHOD OF ASSESSMENT: Exam

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: Technique and technology of loading and unloading processes". D. Petrov, E. Kircheva, Textbook, Sofia 2001. 2. "Elevated transport machines and systems". V. Y. Diviziev, S., Technics, 1999. 3. "Storage and transport warehouse systems". K. Z. Krastev, S., Technics, 1992. 4. "Machines and equipment for continuous transport". S.S. Nachev, S., Technics, 1981. 5. "Electric cars". D. B. Orakaliev, S. Technika, 1969. 6. "Lifting and transport processes and systems in industry". GP Petkov, S., Technics, 1987. 7. Cascetta E. Transportation System Analysis. Second edition, 2014, ISBN 978-0-387-75856-5 e-ISBN 978-0-387-75857-2.

DESCRIPTION OF THE COURSE

Name of the course: **Economics of Transport**	Code: **BpTMT24**	Semester: **8**
Type of teaching: Lectures (L) Tutorials (T)	Hours per semester: L – 20 hours T- 15 hours	Number of credits: **4**

LECTURER(S):
Prof. Toni Mihova (FME), PhD tel. 032 659 714, email: mihova@tu-plovdiv.bg
Chief Assist. Prof. Mariana Kovacheva (FME), PhD tel. 032 659 716,
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COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curricula for training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The main objective of Transport Economics is the study of the transport sector from an economic point of view, to understand the different concepts, and principles of transport economics for effective decision making. It is expected that when the student completes this course, they should be able to analyze the economic processes taking place in transport enterprises as a system.

DESCRIPTION OF THE COURSE: Main topics: Introduction to economics, Business environment of the transport enterprise, Capital and assets of the transport enterprise, Production capacities, Material management of the enterprise, Human resources of the transport enterprise, Costs and cost price, Pricing in the enterprise, Placement and sales of the enterprise, Efficiency of production and economic activity, Financing and investments of the transport enterprise.

PREREQUISITES: Basic knowledge of economic and humanities disciplines is required.

TEACHING METHODS: Lectures and seminars with multimedia techniques. Active teaching methods are used, continuously engaging students.

METHOD OF ASSESSMENT: The final grade is obtained as follows: the average grade from two tests (50%) and an assessment from tutorials (50%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Бакалова В. и др. Икономика на транспорта, София, 2010, 2. Бакалова, В. и др. Икономически анализ на транспортното предприятие, София, 3. Аврамов, П., Икономика на транспорта, София, 2005, 4. Михова, Т., Икономика на предприятието, Макрос, Пловдив, 2017, 5. Дончев Д., Велев Мл., Димитров Й., Бизнес икономика, Софтрейд, 2003, 6. Маринов, Г., Велев М. и др. Икономика на предприемаческата дейност, С. 7. Николова, К., Международен транспорт и спедиция, Университетско издателство "Стопанство", ISBN: 978-954-644-240-6, София.

DESCRIPTION OF THE COURSE

Name of the course: **Transport and ecology**	Code: **BpTMT25.1**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 20 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):

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COURSE STATUS IN THE CURRICULUM: Optional subject from the curriculum for training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The students must to know about the toxic components of the automobile exhaust gases, the methods for their measurement, the legislation on harmful emissions into the exhaust gases in different countries, the test procedures for measuring their content in the exhaust gases. Students should also know about emission control system of internal combustion engine (ICE), noise from vehicles and ways to reduce it.

DESCRIPTION OF THE COURSE: Main topics: Evaluation of pollution from internal combustion engines (ICE). Systems for reduction of environmental pollution by vehicles, equipped with internal combustion engines. Legislation for control of harmful emissions in the exhaust gases of cars. Emission test cycles. Noise, caused by transport. Impact of noise on the environment and the humans. Sources of noise in vehicles. Noise reduction methods. Standardization of vehicle noise.

PREREQUISITES: Chemistry, Fluid Mechanics, 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. Зотов Л.Л. Экологическая безопасность автомобилей, Санкт-Петербург, 2005 г., 2. Кралов И, Банов Ст., Шум в транспортната техника, ТУ-София, София, 2003 г., 3. Крауз У., Енглин Д., Намаляване на отделянето на вредни вещества от автомобила, издателство „Техника“, София, 1981 г., 4. Робърт Бош, Системи за управление на дизелови двигатели, издателство "Консулт - Лозанов", 2011 г. , 5. Рокош У., Бортовая диагностика, издателство „За рулем“, 2013.

DESCRIPTION OF THE COURSE

Name of the course: **Combustion Engines Diagnosis**	Code: **BpTMT25.2**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 20 hours LW – 15 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 specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, 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: Basics of Electrical Engineering and Electronics, Electrical Equipment of 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: **Forklifts**	Code: **BpTMT26.1**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 20 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Prof. Eng. Valyo Nikolov, PhD, (FME), tel.:032 659 594, e-mail: vnikolov@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: Optional subject from the curriculum for training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of the training in "Forklifts" is to deepen the students' knowledge in the field of trucks and the trends in the development of their specific arrangements and drive systems. They will allow them to quickly and competently solve questions related to the features and types of cars. In addition, knowledge is provided in the field of design, organization and management of logistics systems.

DESCRIPTION OF THE COURSE: Topics directly related to the construction, performance and design of carts are covered. The discipline creates skills for the analysis of structures and their dimensioning, paying particular attention to drive systems and other arrangements other than traditional automotive technology. The main principles, methods and technologies of transport logistics are considered; the device and operation of the logistics vehicle; cargo handling technologies; supply chain planning, organization and management; development of logistics strategies and technologies; inventory management.

PREREQUISITES: Basic knowledge of "Mechanics", "Chemistry", " Electrical Engineering and Electronics", "Theory of Internal Combustion Engines", "Design of Internal Combustion Engines", "Theory of Automobile" and "Construction of Automobile" is required.

TEACHING METHODS: Lectures delivered with the help of visual materials, boards, slides and videos. Laboratory exercises carried out according to a guide and protocols developed by the students and checked by the teacher.

METHOD OF ASSESSMENT: Exam

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1.Михайлов, Е. Стоянов, С. Толев, Т. Експлоатация, обслужване и ремонт на електрокари и мотокари. София, Техника. 1979.; 2. Георгиев, Г. Проектиране, конструиране и изчисление на кара. София, Техника. 1980.; 3. Д. Оракалиев, П. Данев, С. Стоянов, П. Милев. Устройство, експлоатация и управление на електрокара и мотокара. София. Техника. 1982.

DESCRIPTION OF THE COURSE

Name of the course: **Wheeled and Crawler Tractors**	Code: **BpTMT26.2**	Semester: **8**
Type of teaching: Lectures (L) Laboratory work (LW)/Tutorials (T)	Hours per semester: L – 20 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Krasimir Ambarev, PhD (FME), tel.: 032 659 575,
e-mail: kambarev@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: Optional subject from the curriculum for training of students to obtain Bachelor's degree, specialty Transport Machinery and Technology, Professional orientation 5.5 Transport, Navigation and Aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The course purpose is to deepen the students' knowledge in the field of wheel and track tractors and their assemblies and systems. They will allow them to quickly and accurately solve questions related to the types of wheeled and tracked tractors, the features of their general device and the construction of their specific units and systems, as well as questions related to the design and construction of wheeled and tracked tractors.

DESCRIPTION OF THE COURSE: Topics directly related to the construction, operational properties and design of wheeled and tracked tractors, their transmissions, undercarriage and working equipment are considered, including the ability to analyses kinematic schemes and determine load and calculation modes.

PREREQUISITES: Basic knowledge of "Mechanics" I and II, "Theory of Machines and Mechanisms", "Strength of Materials", "Theory of ICE", "Design of Internal Combustion Engines", "Theory of Automobile" and "Construction of Automobile" is required

TEACHING METHODS: Lectures delivered using visual materials, boards and slides. Laboratory exercises carried out under laboratory guidance, with protocols developed by the students and checked by the teacher. In the laboratory exercises, an analysis of basic characteristics and operational properties, kinematic schemes and structures of wheeled and tracked tractors is carried out.

METHOD OF ASSESSMENT: Exam

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Пиперков, С., Велев, Н. Теория на трактора и автомобила. София, Земиздат, 1988; 2. Велев, Н. Теория и изчисление на трактора и автомобила. София, Земиздат, 1972; 3. Смиленов, Б., Йолов, Ц. Трактори и автомобили. София, Техника, 1980; 4. Чаръкчиев, Т., Игнатов, С. Трактори. София, Земиздат, 1973.

DESCRIPTION OF THE COURSE

Name of the course: **Sport**	Code: **FaSPR08**	Semester: **8**
Type of teaching: Self-Study (SS)	Hours per semester: SS – 30 hours	Number of credits: **1**

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 curricula for training of students to obtain Bachelor's degree, specialties „Mechanical Engineering and Instrumentation“, „Mechatronics“, „Computer Modelling and Mechanical Engineering“, Professional orientation 5.1 Mechanical engineering; specialties „Transport Machinery and Technology“, „Aeronautical Engineering” Professional orientation“ 5.5 Transport, Navigation and Aviation, specialties „Intelligent systems and artificial intelligence“, „Industrial Management“, “Graphic Design and Printing“, Professional qualification 5.13 General 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.