INFORMATION PACKAGE
/ECTS/

FIELD OF HIGHER EDUCATION: 5. TECHNICAL SCIENCES

PROFESSIONAL FIELD: 5.1. MECHANICAL ENGINEERING

SPECIALITY: AUTO TECHNICAL EXPERTISE

EDUCATIONAL DEGREE: MASTER

LEVEL BY NATIONAL QUALIFICATION FRAMEWORK LEVEL 7

NUMBER OF CREDITS ON ECTS 60

QUALIFICATION: MASTER of ENGINEERING

DURATION: ONE YEAR

FORM OF EDUCATION: FULL TIME

ENTER FROM 2017/2018
QUALIFICATION CHARACTERISTICS

of the specialty: AUTO TECHNICAL EXPERTISE

EDUCATIONAL DEGREE: MASTER
QUALIFICATION: MASTER - ENGINEER IN THE TRANSPORT

PURPOSE AND EDUCATIONAL AIM OF THE SPECIALTY
The Master's program is intended for graduates Bachelor's degree / Master's degree by specialties from professional fields in higher education areas 5. Technical sciences and specialty "Pedagogy of technology and entrepreneurship education" of professional field 1.3. Pedagogy of training on ...
The Master program "Auto-technical Expertise" aims to prepare research, analytical and expert staff in carrying out expertises to habits of attitudes that are necessary to provide technical support for the preparation of expert analysis of road accidents, necessary for the judiciary to know the basic legislative process, regulating the expertise of the experts, the documentation, used in the preparation and carrying out of judicial proceedings and official investigation of traffic-related accidents.

REQUIREMENTS FOR THE PREPARATION OF THE SPECIALIST
The master engineer of the Auto-technical Expertise prepares as a wide-profile specialized training, knowledge of the organization, planning, processing and analysing of experiments. The training course is structured in the following main parts: basic training courses which provide the basic theoretical specialized platform for the specialty Auto-technical expertise, elective courses, facultative study subjects, the graduation of students.

KNOWLEDGE AND SKILLS, NECESSARY FOR PROFESSIONAL ACTIVITY
The Master of Engineering Expert must be prepared to make a professional occupation of the place of the accident,
- to assist the investigative bodies in drafting a screening inspection report,
- to view the means of transport and to co-operate for the making of an expertise,
- to formulate tasks for auto-technical expertise,
- to carry out expert research and to compile the transport accidents.

AREA OF PROFESSIONAL IMPLEMENTATION
Students who successfully complete their training are prepared to carry out in the field of elaboration of legal technical and mathematical justifications, for the needs of pre-trial proceedings, and criminal and civil litigation; to deceive expert
actions in road accidents and to take personal responsibility for their activity; to realize as management personal state, municipal and private transport vehicles, and valuers of transport forwarding companies; and as transport companies, all areas requiring higher education. The specialist is prepared for work in the Auto-technical expertise, as well as technical analysis skills, in the field of accidents, which can be modeled and explored with his / her knowledge and skills as in The Republic of Bulgaria and abroad.

AREA FOR PROFESSIONAL REALISATION
Students who have completed the training are realized by occupying the following national classifications in The Republic of Bulgaria (2011):
- Expert, Expert Engineer, Expert Technical Information; Expert in Technological Maintenance; Engineer, Civil Servant; engineer, mechanic, inspector, road transport safety; inspector of the safety of the transport; mash engineer: technician, mechanic technician criminalist.
Appraiser: Appraiser of the damage control, qualified specialist with control functions; sponsor of the production commencement shift: chief workshop manager; infrastructure and logistics in enterprise quality engineer in production planning, forecasting engineer, production efficiency engineering, technical researcher, lecturer, high school assistant. Masters-engineer can continue with the education and can acquire the degree "DOCTOR".
### CURRICULUM

<table>
<thead>
<tr>
<th>First academic year</th>
<th>ECTS credits</th>
<th>Second semester</th>
<th>ECTS credits</th>
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<td><strong>SELECTED CHAPTERS IN</strong></td>
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<td><strong>LEGAL FRAMEWORK FOR TRANSPORTATION OF TRAFFIC</strong></td>
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<td>ACCIDENTS</td>
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<td><strong>MATHEMATICAL MODELING OF</strong></td>
<td>3</td>
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<td>OF THE VEHICLE</td>
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<td><strong>ENGINEERING STUDIES</strong></td>
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<td><strong>Elective course from Group 2</strong></td>
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<td><strong>DIPLOMA THESIS</strong></td>
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<td><strong>MODERN SYSTEMS FOR THE</strong></td>
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TOTAL: 60 CREDITS FOR ONE ACADEMIC YEARS
THEORY OF THE ENGINEERING SCIENCE

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<td><strong>Course type:</strong> lectures + laboratory exercises</td>
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<td><strong>Course status:</strong> Compulsory</td>
<td><strong>Degree Course:</strong> Auto Technical Expertise</td>
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</table>

**Lecturer:** Assoc. Prof. Eng. Dimitrina Kerina, PhD, Email: d_kerina@swu.bg

**Department:** Mechanical engineering

**Faculty:** Faculty of Engineering

**Phone:** (+359 73) 073 88 51 62, Email: technical_mtt@swu.bg

**Description of the discipline:**
The training in the subject includes the study of the basic issues related to the mathematical foundations of the engineering experiment. The discipline contains the mathematical apparatus necessary for the study of the engineering disciplines provided in the curriculum and prepares future specialists for independent engineering. Basic knowledge and skills are required from the Bachelor's degree course in Mathematics.

**Aim of the discipline:**
The aim of the course is to enhance the main knowledge of the students and to develop their habits for a constructive approach in the application of mathematical knowledge in engineering. They are going to be acquainted with special questions from the theory of differential equations, methods of approximating functions, numerical methods (approximation of algebraic equations and systems of algebraic equations, numerical differentiation and integration, numerical solution of differential equations) for optimization.

**Educational methods:**
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

**Inscribing for tuition:** Not necessary.
**Inscribing for exam:** Agreement with the lecturer and the Students Service Department
SELECTED CHAPTERS IN MECHANICS

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**Lecturer:** Assoc. Prof. Eng. Raika Cingova, PhD, Email: rajkach@swu.bg
Department: Mechanical engineering
Faculty: Faculty of Engineering
Phone: (+359 73) 073 88 51 62, Email: technical_mtt@swu.bg

**Description of the discipline:**

The training in the discipline involves the study of the main issues of theoretical mechanics. The course includes basic laws, equations and theorems of dynamics, kinematic dependencies in complex mechanical systems, and differential equations in motion of mechanical systems with more than one degree of freedom. The discipline gives the students the necessary knowledge for realization in fields of modern science and technology. Meanwhile, Mechanics helps to build an engineering approach and habits to solve a variety of transport tasks. The discipline is based on the knowledge of Mechanics, Higher Mathematics, Physics, Theory of Mechanisms and Machines.

**Aim of the discipline:**

The aim of the course is to improve students' knowledge of mechanics by studying additional equations, laws and methods for studying the movement of various mechanical systems, to apply this knowledge in engineering practice, and to develop an engineering approach to the calculation of devices, fittings and machinery.

**Educational methods:**

Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

**Inscribing for tuition:** Not necessary.
**Inscribing for exam:** Agreement with the lecturer and the Students Service Department
THEORY AND CONSTRUCTION OF THE VEHICLE

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Lecturer: Prof. DTS Eng. Stanimir Karapetkov PhD, Email: skarapetkov@gmail.com
Department: Mechanical engineering
Faculty: Faculty of Engineering
Phone: (+359 73) 073 88 51 62, Email: technical_mtt@swu.bg

Description of the discipline:
The course includes the study of the construction of the automotive equipment and gives knowledge about the basic principles of the automotive theory. The discipline forms practical skills for determining the basic exploitation properties, in students. The exploitation properties related to the movement of the self-propelled machine are studied, namely: dynamics, fuel economy, manageability, stability, road ability and easiness of the movement. Also the knowledge of the construction of the individual parts, hitches and aggregates of the vehicle separately and in general, on the main loads and computation modes, as well as to acquaint the students with the materials used in the constructions and the ways of their dimensioning.

Aim of the discipline:
The aim of the course is to improve students' knowledge of Mechanics, by studying additional equations, laws and methods for studying the movement of various mechanical systems, to apply this knowledge in engineering practice, and to develop an engineering approach to the calculation of devices, fittings and machines.

Educational methods:
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

Inscribing for tuition: Not necessary.
Inscribing for exam: Agreement with the lecturer and the Students Service Department
DYNAMIC AUTOMOTIVE THE TECHNOLOGIES

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<td>Degree Course: Auto Technical Expertise</td>
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Lecturer: Assoc. Prof. Eng. Raika Cingova, PhD, Email: rajkach@swu.bg
Department: Mechanical engineering
Faculty: Faculty of Engineering
Phone: +359 73) 073 88 51 62, Email: technical_mtt@swu.bg

Description of the discipline:

Training in the discipline involves studying the dynamic properties of the vehicle when starting, driving and stopping, needed in case of investigation after car accidents. In this case, we analyze dynamic car models with the application of the acting forces, according to the stages of motion, as well as the main factors influencing the loss of dynamic properties. The study serves as a technical justification for preparing an expert analysis of the crash-related crimes, because that is necessary for the judicial system. The exercises include solving tasks, related to the dynamic parameters, the stability of the vehicle, as well as indicators for the economy while in motion.

Aim of the discipline:

The aim of the course is to provide students with theoretical and practical knowledge of the dynamic properties of the vehicle, when starting, driving and stopping, as well as solving tasks related to dynamic parameters, vehicle sustainability and economy of management.

Educational methods:
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

Inscribing for tuition: Not necessary.
Inscribing for exam: Agreement with the lecturer and the Students Service Department
ROAD SAFETY ORGANIZATIONS

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Lecturer: Assoc. Prof. Eng. Snejina Andonova, PhD, Email: andonova_sn@swu.bg
Department: Mechanical engineering
Faculty: Faculty of Engineering
Phone: +(359 73) 073 88 51 62, Email: technical_mtt@swu.bg

Description of the discipline:

The training in the discipline includes the study of the main issues, related to the traffic safety rules and the relevant criminal procedures for their violation. The training in the discipline is related to the need for helping the improvement of the organization and safety of road traffic in Bulgaria, through the preparation of well-informed and disciplined specialists in this field.

Aim of the discipline:

The aim of the course is to acquaint students with the main normative documents for ensuring safe traffic on the roads, to know the rules of traffic safety, to know the causes of road accidents and their prevention, to know the administrative and penal procedures for violations of road traffic.

Educational methods:
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

Inscribing for tuition: Not necessary.
Inscribing for exam: Agreement with the lecturer and the Students Service Department

MODERN SYSTEMS FOR THE MANAGEMENT AND SAFETY OF THE VEHICLE

| ECTS credits: 3 | Semester: 1 |
**Exam type:** written exam  
**Hours per week:** 2 lectures+1 laboratory exercises  
**Course type:** lectures + laboratory exercises  
**Course status:** Compulsory  
**Degree Course:** Auto Technical Expertise

**Lecturer:** Assoc. Prof. Eng. Aleksei Stefanov, PhD, Email: astef@swu.bg  
Department: Mechanical engineering  
Faculty: Faculty of Engineering  
Phone: +(359 73) 073 88 51 62, Email: technical_mtt@swu.bg

**Description of the discipline:**

Training in the discipline includes the study of modern safety systems, built into the vehicle and the trends in the development of these systems. In addition, issues concerning the road behavior of the vehicle over time are considered, taking into account the interconnection between the aggregates and the influence of the road. It addresses the issues of vehicle movement related to electronic active safety systems, which today have become the standard for every modern car's and the sustainability as well as the principles of building active systems for monitoring and controlling these processes, as well as the state of road cover and obstacles as a source of disturbing impacts. The exercises involve solving tasks related to the dynamic parameters, the stability of the vehicle, as well as indicators for the economy while in motion.

**Aim of the discipline:**

The aim of the course is to provide students with theoretical and practical knowledge in the field of current safety systems, built into the vehicle, and trends in the development of these systems.

**Educational methods:**

Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

**Inscribing for tuition:** Not necessary.  
**Inscribing for exam:** Agreement with the lecturer and the Students Service Department
CONSTITUTION OF THE JUDICIAL SYSTEM

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**Lecturer:** Assoc. Prof. Eng. Veselina Buchkova, PhD, Email: technical_mtt@swu.bg
Department: Mechanical engineering
Faculty: Faculty of Engineering
Phone: (+359 73) 073 88 51 62, Email: technical_mtt@swu.bg

**Description of the discipline:**
The course includes the study of the structure, and the structure of the judicial system of Republic of Bulgaria, the hierarchy of the laws and regulations, the legislative initiative, the adoption of laws and regulations, as a distinct place for the penal normative acts and the specialized legislation in the field of road traffic accidents. In this sense, the "Road Traffic Law", which aims to protect the life and health of road users, to facilitate their movement, to protect the property and the environment from pollution of motor vehicles and to create regulatory preconditions and conditions for permanent reduction of victims of road accidents; "Rules for Implementation of the TPA"; "Criminal Code", which defines what socially dangerous acts are crimes, and what penalties are imposed on them, and to established cases where measures for public impact and education may be imposed, instead of punishment. Auto-technical expertise for investigation of traffic accidents and other normative acts in this direction.

**Aim of the discipline:**
The aim of the course is to acquire basic knowledge of the structure of the judicial system of the Republic of Bulgaria and the specialized legislation in the field of road accidents.

**Educational methods:**
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

**Inscribing for tuition:** Not necessary.
**Inscribing for exam:** Agreement with the lecturer and the Students Service Department
Description of the discipline:
The training in the discipline includes the study of the scientific methodological apparatus for the preparation of the technical expertise, with the basic methods of responding to the main tasks of the expertise - place of impact / encounter, speed of vehicles, technical possibility for drivers to prevent crashes. Separate issues deal with the activities of autoexperts in inspections, their rights and obligations, preparation of documentation, reporting in court, etc. Particular attention is paid to the methodology of the expert analysis of the most common types of crashes. The sequence of calculations, the influence of various factors and parameters, the style of the exhibition in the expertise, the graphic material, the conclusions, etc. that are given.

Aim of the discipline:
The aim of the course is to acquire basic knowledge and acquire practical skills in the expert technical study of road accidents, in the practical actions during the inspections, the drawing of the scale sketch, the actions in the investigation and specialist’ report in courts’ hearing.

Educational methods:
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

Inscribing for tuition: Not necessary.
Inscribing for exam: Agreement with the lecturer and the Students Service Department.
**Description of the discipline:**
The training in the discipline includes the study of the scientific methodological apparatus for preparing the technical expertise, respectively, the main methods of responding to the main tasks of the expertise - the place of the impact / encounter, the spies of the vehicle, the technical possibility for the drivers to prevent crashes. Separate issues deal with the activities of auto experts in inspections, their rights and obligations, preparation of documentation, reporting in court, etc. Particular attention is paid to the methodology of the expert analysis of the most common types of accidents. The sequence of calculations, the influence of various factors and parameters, the style of the exhibition in the expertise, the graphic material, conclusions, etc. that are given.

**Aim of the discipline:**
The aim of the course is to provide students with theoretical and practical knowledge and to acquire them with skills for the scientific methodological apparatus for preparing the technical expertise, respectively, to familiarize themselves with the basic methods of answering the main tasks of the expertise, to acquire skills in the expert's practical actions in the pre-investigations, to know the documentation used in the preparation of the expert report, and the report at courts’ hearing.

**Educational methods:**
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

**Inscribing for tuition:** Not necessary.
**Inscribing for exam:** Agreement with the lecturer and the Students Service Department
Description of the discipline:

The training in the discipline includes the study of the normative basis, the regulation of the auto-technical expertise, its admission and appointment in the pre-trial and the judicial stage in the criminal and civil litigation, the stages of investigating the crash, the assignment of complex forensic and auto-technical expertise, the collection of written and vowel evidence in the case, inspection of crashes, witnesses, testimonies, photo and video, etc. The course focuses on the place, status and role of the technical expertise.

Aim of the discipline:

The aim of the course is to obtain the theoretical and practical knowledge in the scientific methodological apparatus for the preparation of the technical expertise, the types of expertise, the normative basis in the criminal and civil court proceedings, related to the admission and commissioning of the expertise of the expert, and to acquire the knowledge of road traffic accidents, procedural actions, related to road accidents, formation and prosecution of injustice and court proceedings, and the established regulations in this field.

Educational methods:

Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

Inscribing for tuition: Not necessary.
Inscribing for exam: Agreement with the lecturer and the Students Service Department
MATHEMATICAL MODELING OF ENGINEERING STUDIES

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<td>Degree Course: Auto Technical Expertise</td>
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Lecturer: Assoc. Prof. Borislav Yurukov, PhD, Email: yurukov@swu.bg
Department: Mechanical engineering
Faculty: Faculty of Engineering
Phone : (+359 73) 073 88 51 62, Email: technical_mtt@swu.bg

Description of the discipline:

The course includes the study of the mathematical apparatus, necessary for the study of the engineering disciplines, envisaged in the curriculum, and prepares the future specialists for self-engineering - solving of systems of ordinary differential equations (TACs), methods of approaching tabulated functions, application numerical methods in solving mathematical models and basic methods of linear optimization, constructing and solving transport problems.

Aim of the discipline:

The aim of the course is for students to develop habits for a constructive approach in the application of mathematical knowledge in engineering. They are going to be acquainted with special matter from the theory of differential equations, methods of approximating functions, numerical methods (approximation of algebraic equations and systems of algebraic equations, numerical differentiation and integration, numerical solution of differential equations) for optimization.

Educational methods:
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

Inscribing for tuition: Not necessary.
Inscribing for exam: Agreement with the lecturer and the Students Service Department
TRAUMA AFTER TRAFFIC ACCIDENTS

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Lecturer: Assoc. Prof. Daniela Petkova, PhD, Email: technical_mtt@swu.bg
Department: Mechanical engineering
Faculty: Faculty of Engineering
Phone: (+359 73) 073 88 51 62, Email: technical_mtt@swu.bg

Description of the discipline:
The course includes the study of the types of injuries after a road accident, the mechanisms of obtaining the transport injuries, the sequence of injuries and the conformity of the resulting trauma deformation on the vehicle and its cabin. Particular attention is paid to the methodology of the expert analysis of the most common traumas. It gives the sequence of the phases of impact, the influence of different factors and parameters, the style of the exhibition in the expertise, the conclusions, etc.

Aim of the discipline:
The aim of the course is to acquire the theoretical and practical knowledge in the scientific methodological apparatus for the preparation of complex forensic and auto-technical expertise, respectively to get acquainted with the basic methods of answering the main tasks of the expert's examination - types of injuries and mechanism of their obtaining, and their relationship to the road traffic accident.

Educational methods:
Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

Inscribing for tuition: Not necessary.
Inscribing for exam: Agreement with the lecturer and the Students Service Department
FORENSICS

<table>
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**Lecturer:** Prof. Kostadin Bobev, Email: kbobev@law.swu.bg  
Department: Mechanical engineering  
Faculty: Faculty of Engineering  
Phone: (+359 73) 073 88 51 62, Email: technical_mtt@swu.bg

**Description of the discipline:**

Training in this discipline includes the study of the legal basis, the regulations of the court expertises, the types of expert opinions, the classification of the court expertises, the main issues related to the admission and the appointment of judicial expertise. Both in the pre-trial phase and in the judicial phase. Questions related to the admission of further and re-expertises are considered. A particular place is devoted to the main issues, tasks, placed in the various expert reports.

**Aim of the discipline:**

The aim of the course is to acquire the theoretical and practical knowledge in the scientific methodological apparatus for the preparation of judicial expertise, the types of expertise, the normative basis in the criminal and civil litigation, related to the admission and commissioning of the expertise from the expert.

**Educational methods:**

Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, solve problems, exercise, and Power Point presentation.

**Inscribing for tuition:** Not necessary.
**Inscribing for exam:** Agreement with the lecturer and the Students Service Department