Module: Automotive and Transportation Engineering

Year of study 1
Semester 1

COURSE	ECTS
Design of Railway Vehicles	4
Maintenance of Motor Vehicles	8
Motor Vehicles 2	8
Transport Systems Dynamics	4
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Commercial Vehicles	5
Design of Material Handling Machinery	6
Electrical Systems of Motor Vehicles	5
Homologation of Motor Vehicles	4
Practice	4
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Design of Vehicle Propulsion	8
Engine and Vehicle Testing	4
IC Engine and Motor Vehicle Computer Simulations 2	5
Project ATT	4
Selected Topics in Transport	3
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Construction Machines	3
Engineering Design Optimization	3
Engineering Product Design	3
Engines, Vehicles and the Environment	3
Mechanical Engineering: Legislation, Regulations and Code	2
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Energy and Environment
Specialization: Power Engineering

Year of study 1
Semester 1

COURSE	ECTS
Energy Management	6
Environmental Engineering E	6
Hydro Energy	6
Steam Generators	6
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Energy Systems	5
Heat Turbomachines	5
Practice	4
Water Engineering	5
Wind Power Plants	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Design of Turbomachines	6
Energy Storage	6
Heat Pumps with Renewable Energy Sources	6
Pumps and fans	6
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Design of Water Treatment Systems	3
Measurements in Power Engineering	4
Process control	3
Steam Generators Construction	4
Elective course of module III	3
Free elective course	3
Diploma Thesis	10

Module: Energy and Environment
Specialization: Renewable Energy Sources and Environmental Protection

Year of study 1
Semester 1

COURSE	ECTS
Energy Management	6
Environmental Engineering E	6
Hydro Energy	6
Steam Generators	6
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Energy Systems	5
ORC Technologies and Applications	5
Practice	4
Water Engineering	5
Wind Power Plants	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Energy Storage	6
Fuels and Lubricants in Power Engineering	6
Hydrogen and Fuel Cells	6
Solar Thermal Systems	6
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Design of Water Treatment Systems	3
Energy planning and modelling of energy systems	3
Environmental Management Systems	4
Measurements in Environmental Protection	4
Elective course of module III	3
Free elective course	3
Diploma Thesis	10

Module: Energy and Environment
Specialization: Smart Energy Systems

Year of study 1
Semester 1

COURSE	ECTS
Energy Management	6
Environmental Engineering E	6
Hydro Energy	6
Steam Generators	6
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Energy Economics, Innovation and Business in Energy Engineering	5
Energy Systems	5
Energy Systems in Industry	5
Practice	4
Wind Power Plants	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Energy Markets	6
Heat Pumps with Renewable Energy Sources	6
Hydrogen and Fuel Cells	6
Solar Thermal Systems	6
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Energy Planning and Modelling of Energy Systems	3
Environmental Management Systems	4
Measurements in Environmental Protection	4
Process Control	3
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Engineering Design and Mechanical Analysis
Specialization: Structural Calculation

Year of study 1
Semester 1

COURSE	ECTS
Biomechanics	6
Computer Integrated Product Development	7
Fatigue Service Life Assessment of Mechanical Structures	3
Fatigue Service Life Assessment of Mechanical Structures - practicum	3
Technological Design	5
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Advanced Engineering Informatics	4
Finite Element Method in Structural Design	5
Finite Element Method in Structural Design - practicum	2
Kinematics and Dynamics of Mechanisms	4
Material Handling Devices and Machines	5
Practice	4
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Calculation of Metal Structures	7
Monitoring and Integrity of Structures	5
Optical Methods in Mechanics	7
Robot Design Elements	5
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Active Vibration Control	4
Inverse Methods in Mechanics	4
Limit Analysis of Structures	3
Structural Stability	3
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Engineering Design and Mechanical Analysis
Specialization: Engineering Design and Product Development

Year of study 1
Semester 1

COURSE	ECTS
Biomechanics	6
Computer Integrated Product Development	7
Fatigue Service Life Assessment of Mechanical Structures	3
Fatigue Service Life Assessment of Mechanical Structures - practicum	3
Technological Design	5
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Advanced Engineering Informatics	4
Calculation of Joints of Structures	5
Material Handling Devices and Machines	5
Motion and Power Transmission	6
Practice	4
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Actuators and Electric Drives	5
Artificial Intelligence Methods in Design	5
Engineering of Complex Technical Systems	4
Robot Design Elements	5
Technical Information Systems	5
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
CAD - Advanced Surface Modelling	4
Innovation Management in Product Development	3
Lightweight Design	4
Management of Engineering Design Process	3
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Engineering Design and Mechanical Analysis
Specialization: Medical Structures

Year of study 1
Semester 1

COURSE	ECTS
Biomechanics	6
Computer Integrated Product Development	7
Fatigue Service Life Assessment of Mechanical Structures	3
Fatigue Service Life Assessment of Mechanical Structures - Practicum	3
Technological Design	5
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Application of Biomaterials	3
Biomechanics of the Locomotor System	4
Continuum Mechanics	5
Experimental Mechanics of Biological Tissue	4
Kinematics and Dynamics of Mechanisms	4
Practice	4
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Ergobiomechanics	4
Machining Systems in Medical Engineering	5
Numerical Modelling in Biomechanics	3
Numerical Modelling in Biomechanics - Practicum	2
Principles of Diagnostic and Therapeutic Systems	4
Prostheses and Implants	6
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Biological Fluid Mechanics	3
Mechanics of Composite Materials	3
Mechanics of Inelastic Bodies	3
Research and Development of Medical Constructions	5
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Engineering Modelling and Computer Simulations

Year of study 1
Semester 1

COURSE	ECTS
Computational Fluid Dynamics II	5
Damage and Fracture Mechanics	5
Numerical Analysis of Structures	3
Numerical Modeling of Damage and Fracture of Structures - Practicum	6
Selected Topics in Thermodynamics	5
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Continuum Mechanics	5
Finite Element Method in Structural Design	5
Gas Dynamics	5
Practice	4
Vibration of Distributed Parameter Systems	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Dynamics of Machines	4
Dynamics of Rigid Body Systems	4
Nonlinear Numerical Structural Analysis	4
Nonlinear Numerical Structural Analysis - Computational Practicum	4
Computational Thermodynamics	3
Transport Phenomena	5
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Active Vibration Control	3
Computational Material Modelling	4
Environmental Fluid Mechanics	4
Mechanics of Inelastic Bodies	3
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Industrial Engineering and Management

Year of study 1
Semester 1

COURSE	ECTS
Computer Aided Manufacturing - CAM	6
Elective course of module I	3
Integrated Production System Planning	5
Operations Research I	7
Production Information Systems	6
Free elective course	3

Semester 2

COURSE	ECTS
Industrial Sociology	4
Modeling and Managemet of Logistics Systems	
Operations Research II	6
Practice	4
Work Study and Ergonomics	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Decision Support Systems	5
Design of Experiments	5
Industrial Management	4
Simulation of Production and Logistics Systems	5
Sustainable Production and Supply Chains	5
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Accounting and Finance	3
Foundations of Commercial Law	2
Multivariate Statistical Methods	3
Project Management	3
Robotics in Production	3
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Marine Engineering

Year of study 1
Semester 1

COURSE	ECTS
Design of Experiments	5
Electrical Servodrives	5
Marine Engine Plants	6
Marine Engine Plants - Project	2
Steam Generators	6
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Marine Auxiliary Engines	7
Marine Propulsors	6
Practice	4
Ship Vibration	7
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Decision Support Systems	5
Project ME	
Pumps and Fans	6
Ship Design	6
Small Crafts Propulsion Plants	4
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Energy Efficiency and Environmental Friendliness of Ships	5
Microclimate of Ship	4
Shipboard Machinery Room Design	5
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Materials Engineering

Year of study 1
Semester 1

COURSE	ECTS
Advanced Materials and Technologies	3
Light and Non-ferrous Metals	9
Nanostructured Materials	6
Structure and Properties of Materials	6
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Composites	7
Forensic in Materials Engineering	5
Powder Metallurgy	3
Practice	4
Smart and Functional Materials	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Heat Treatment	6
Modeling and Simulation	8
Quality Assurance	3
Technical Ceramics	7
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Business Systems and Management	3
Joining Processes	3
Materials Selection	4
Surface Engineering	4
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Pipeline Systems Engineering

Year of study 1
Semester 1

COURSE	ECTS
Environmental Engineering in Pipeline Systems	6
Non-destructive Testing	5
Pumps and Fans	6
Vacuum Technology	7
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Gas Dynamics	5
Gas Systems	5
Geographic Information Systems in Energy Engineering	3
Mechanisms of Corrosion Protection	3
Practice	4
Project 1	4
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Flammable Fluids Transport and Fire Protection	4
Heating Pipelines	4
Hygienic Design of Water Installations	3
Project 2	4
Strength and Stability of the Pipe	4
System Dynamics	5
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Pumping Station Design	4
Waste Management	5
Water Treatment Technology	5
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Polymer Processing and Additive Manufacturing

Year of study 1
Semester 1

COURSE	ECTS
Additive Manufacturing of Polymer Products	6
Computer Aided Design for Additive Manufacturing	6
Metallic and Polymeric Materials	6
Polymer Processing	6
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Automatic Assembly and Packing	5
Control Systems of Industrial Machines	5
Design of Tools for Polymer Processing	5
Dimensional Measurements of 3D-printed Structures	5
Practice	4
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Additive Manufacturing of Metallic Products and Tools	6
Artificial Intelligence Methods in Design	5
Maintenance of Production Systems	4
Non-destructive Testing	5
Special Casting Techniques	4
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Basics of Design and Analysis of Experiments	3
Composite Design and Production	4
Entrepreneurship	3
Recovery Procedures	4
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Production Engineering
Specialization: Machining Systems

Year of study 1
Semester 1

COURSE	ECTS
Integrated Production System Planning	5
Logistics	5
Maintenance of Production Systems	4
Measurement Techniques in Industry	5
Production - Planning and Management	5
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Control Systems of Industrial Machines	5
Forming Machines in Production Processes	5
Planning and Design of Machining Systems	5
Practice	4
Tools for Metal Forming and Cutting Technology	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Additive Manufacturing of Metallic Products and Tools	6
Advanced Manufacturing Processes	6
Computer Aided Manufacturing - CAM	6
Numerical Control Systems	6
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Automatic Assembly and Packing	5
Casting Machines and Systems	3
Flexible Processes in Metal Forming	3
Quality Management Systems	3
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Production Engineering
Specialization: Welded Structures

Year of study 1
Semester 1

COURSE	ECTS
Integrated Production System Planning	5
Logistics	5
Maintenance of Production Systems	4
Measurement Techniques in Industry	5
Production - Planning and Management	5
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Basics of Design and Analysis of Experiments	3
Corrosion of Weldments	3
Forenzic in Materials Engineering	5
Practice	4
Protection via Inorganic Coatings	4
Weldability of Materials	5
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Dimensional Measurements on Welded Structures	4
Equipment and Energy Sources for Welding and Allied Processes	5
Heat Treatment	6
Mechanical Properties of Weld Joints	4
Protection by Organic Coatings	5
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Non-destructive Testing of Welded Structures	3
Quality Assurance of Welded Structures	3
Project	2
Quality Management Systems	3
Robotized Welding and Surfacing	3
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Quality Engineering and Metrology

Year of study 1
Semester 1

COURSE	ECTS
Accreditation Systems	4
Contemporary Quality Control Methods	3
Metrology Infrastructure	5
Numerical Methods in Metrology	5
Project	2
Statistical Modeling in Quality Engineering	5
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
3D Metrology	4
Certification Systems	4
Dimensional Measurements in Manufacturing	4
Internet of Things and Cloud Computing	5
Quality Management Systems	3
Practice	4
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Engineering Optics Basics	5
Non-destructive Testing	5
Selected Chapters of Ultrasonic Measurement and Testing	5
Temperature Metrology	5
Reliability of Non-destructive Inspection	4
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Basics of Design and Analysis of Experiments	3
Digital Ultrasonic Testing Techniques	3
Measurement of Mechanical Quantities	3
Pressure Metrology	5
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Sustainable Energy Systems in Built Environment and Industry
Specialization: Process Engineering

Year of study 1
Semester 1

COURSE	ECTS
Design of Heat Apparatus	7
Design of HVAC systems I	8
Refrigeration and Heat Pump Technology	9
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Experimental Analysis of Apparatus	6
Particulate Technology	6
Practice	4
Thermal Process Engineering	8
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Cryogenics	5
System dynamics	5
Technical Drying Processes	7
Vacuum Technology	7
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Design of Mesurement Systems	4
Design of Water Treatment Systems	3
Process System Optimization	3
Testing of Thermal Properties of Matter	4
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10

Module: Sustainable Energy Systems in Built Environment and Industry
Specialization: Sustainable Energy Usage

Year of study 1
Semester 1

COURSE	ECTS
Design of Heat Apparatus	7
Design of HVAC systems I	8
Refrigeration and Heat Pump Technology	9
Elective course of module I	3
Free elective course	3

Semester 2

COURSE	ECTS
Design of HVAC systems II	8
Experimental Analysis of Apparatus	6
Practice	4
Refrigeration System Design	6
Elective course of module II	3
Free elective course	3

Year of study 2
Semester 3

COURSE	ECTS
Computational Methods in Testing	6
Computer Simulations of the Built Environment	7
Heat Pumps with Renewable Energy Sources	6
System Dynamics	5
Elective course of module III	3
Free elective course	3

Semester 4

COURSE	ECTS
Artificial Intelligence and Digitalization in the Energy Sector	3
Design of Mesurement Systems	4
Energy Systems Planning	3
Low Carbon and Smart Buildings	4
Elective course of module IV	3
Free elective course	3
Diploma Thesis	10