Study plan

Name of study plan: B TZSI 2021 - prezenční

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Welcome page
Type of study: unknown full-time
Required credits: 156
Elective courses credits: 30
Sum of credits in the plan: 186
Note on the plan: odebrány předměty typu alfa, původní minimální počet kreditů pro absolvování studijního plánu byl 224

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 135
The role of the block: P

Code of the group: 01P1/B2342-B/FSI23P
Name of the group: 1. B TZSI (s KVI a ZT1)
Requirement credits in the group: In this group you have to gain 29 credits
Requirement courses in the group: In this group you have to complete 8 courses
Credits in the group: 29
Note on the group: odebrány předměty alfa, původní skupina 01P1/B2342-B/FSI17P

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2021026	**Physics I**	Z,ZK	5	4P+1C+1L	L	P
2313028	**Career in Engineering** *Václav Bauma, Zbyněk Šika, Michael Valášek* ***Michael Valášek*** *Michael Valášek (Gar.)*	Z	2	1P+1C	Z	P
2011018	**Constructive Geometry** *Jan Halama, Ivana Linkeová, Marta Hlavová, Martin Hanek, Milana Kittlerová, Nikola Pajerová, Vladimír Prokop, David Trdlička, Jaroslav Cibulka* ***Ivana Linkeová*** *Ivana Linkeová (Gar.)*	Z,ZK	5	3P+2C	1	P
2011067	**Mathematics I.** ***Gejza Dohnal***	Z,ZK	6	4P+4C	*	P
2372041	**Computer Support for Study** ***Vladimír Hlaváč***	KZ	3	1P+1C	*	P
2132031	**Engineering Design I.** *František Lopot, Karel Petr, Marek Štádler, Roman Uhlíř* ***Karel Petr*** *Karel Petr (Gar.)*	KZ	3	1P+2C	1	P
2333008	**Fundamental of Technology I.** ***Marie Kolaříková***	Z	2	1P+1C	1	P

Characteristics of the courses of this group of Study Plan: Code=01P1/B2342-B/FSI23P Name=1. B TZSI (s KVI a ZT1)

2021026	Physics I	Z,ZK	5
Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurement of experiments related to the lectures.			
2313028	Career in Engineering	Z	2
The goal is to teach the principles of engineering, tits fundamental concepts, personal profile and career procedure in industrial enterprize.			
2011018	Constructive Geometry	Z,ZK	5
The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.			
2011067	Mathematics I.	Z,ZK	6
In the course, greater emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections between concepts. Students will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eigennumbers and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.			

2372041	Computer Support for Study	KZ	3
The course introduces students into creating technical and professional documents on computers or Web and into realizing technical computations with the use of computers. Students gain practical skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating technical-based WWW page.			
2132031	Engineering Design I.	KZ	3
Basic of technical representation, dimensioning and tolerancing.			
2333008	Fundamental of Technology I.	Z	2

Code of the group: 02P1/B2342--/FSI23P
Name of the group: 2. B TZSI (s ZT2)
Requirement credits in the group: In this group you have to gain 31 credits
Requirement courses in the group: In this group you have to complete 9 courses
Credits in the group: 31
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2021027	**Physics II**	Z,ZK	4	2P+2L		P
2381054	**Management and Economics of the Enterprise** *Theodor Beran, Štěpánka Uličná, Vladimír Brdek, Ladislav Vaniš, Petr Žemlička* ***Theodor Beran*** *Theodor Beran (Gar.)*	Z,ZK	4	2P+2C	*	P
2011068	**Mathematics II.**	Z,ZK	6	4P+4C		P
2322029	**Materials Science I.** *Jana Sobotová, Eliška Galčíková, Jiří Cejp, Pavlína Hájková, Jan Krčil, Vladimír Mára, Lucie Pilsová, Taťana Vacková* ***Jana Sobotová*** *Jana Sobotová (Gar.)*	KZ	3	2P+1L	2	P
TV-2	**Physical Education**	Z	1		L	P
TVK-L	**Physical Education Course**	Z	1	7dní	L	P
2121046	**Thermomechanics** *Tomáš Hyhlík, Hana Schmirlerová* ***Tomáš Hyhlík*** *Tomáš Hyhlík (Gar.)*	Z,ZK	5	3P+1C+0L		P
2343010	**Fundamentals of Technology II.** ***Pavel Novák***	Z	2	1P+0C+1L	2	P

Characteristics of the courses of this group of Study Plan: Code=02P1/B2342--/FSI23P Name=2. B TZSI (s ZT2)

2021027	Physics II	Z,ZK	4
Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, ;laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.			
2381054	Management and Economics of the Enterprise	Z,ZK	4
The subject is intended to teach the students of the Faculty of Mechanical Engineering the basic economic starting points necessary for technical reasoning and to help them understand the basic relationships between economic quantities costs - revenues, expenses - incomes and other basic economic terms. The goal is for the audience to be able to communicate with economists in organizations. every product or service is valued at a selling price and therefore it is necessary to understand the simple costing of products and services. Every technician will encounter reports and should understand the basic structure of financial statements. As a future manager, he will compile and approve the operating budget. In the field of management, they will learn basic managerial functions and their content. Furthermore, they will learn how to use network analysis in project management. For decision-making purposes, they will learn the applications of multi-criteria decision-making. The basics of marketing and strategic management will be introduced.			
2011068	Mathematics II.	Z,ZK	6
Open and closed set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.			
2322029	Materials Science I.	KZ	3
History and present state of materials engineering, overview of technical materials, internal structure of metals, crystal lattices and their defects, deformation, recrystallization and fracture of materials, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformations, iron-carbon phase diagram.			
TV-2	Physical Education	Z	1
TVK-L	Physical Education Course	Z	1
2121046	Thermomechanics	Z,ZK	5
Basic laws of thermodynamics. State equation of ideal gas. Ideal and semi-ideal gases and their properties. Reversible and typical irreversible processes of ideal and semi-ideal gases. Mixtures of gases. Real gases and vapours, reversible and irreversible processes. Cycles of typical motors and machines. Moist air. Fundamentals of chemical thermodynamics. Thermodynamics of chemical reactions. Basic cases of heat transfer. Steady heat conduction. Heat convection. Similarity, a criterion equation. Heat transfer during phase changes. Thermal radiation. Combined cases of heat transfer. Heat exchangers.			
2343010	Fundamentals of Technology II.	Z	2
Introduction to machining. Principle of cutting process. Working parameters. Cutting tools - general characteristics, geometry, designation and symbols. The basic machining processes, their mechanics, equipment, conditions, material removal rate determination. The shapes produced, commercial tolerance and surface finish obtained. Laboratories.			

Code of the group: 03P1/B2342--/FSI23P
Name of the group: 3. B TZSI
Requirement credits in the group: In this group you have to gain 31 credits
Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 31
Note on the group: odebrány předměty alfa, původní skupina 03P1/B2342--/FSI19P

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2182019	**Chemistry** *Radek Šulc, Martin Dostál, Vojtěch Bělohlav, Stanislav Solnař, Jan Skočilas* ***Radek Šulc*** *Radek Šulc (Gar.)*	KZ	3	2P+1C	1	P
2011009	**Mathematics III** *Jan Halama, Milana Kittlerová, Vladimír Prokop, David Trdlička, Marta Čertíková, Jan Valášek, Hynek Řezníček, Luděk Beneš, Tomáš Bodnár, ...* ***Stanislav Kračmar*** *Stanislav Kračmar (Gar.)*	Z,ZK	5	2P+2C	*	P
2311101	**Mechanics I.** *Václav Bauma, Zbyněk Šika, Michael Valášek, Pavel Bastl, Petr Beneš, Ivo Bukovský, Martin Nečas, Zdeněk Neusser, Jan Pelikán, ...* ***Zbyněk Šika*** *Zbyněk Šika (Gar.)*	Z,ZK	4	2P+2C	*	P
2121502	**Fluid Dynamics** *Tomáš Hyhlík, Hana Schmirlerová* ***Tomáš Hyhlík*** *Tomáš Hyhlík (Gar.)*	Z,ZK	5	3P+2C	Z	P
2321039	**Materials Science II.** *Jana Sobotová, Eliška Galčíková, Jiří Cejp, Pavlína Hájková, Jan Krčil, Vladimír Mára, Lucie Pilsová, Taťana Vacková, Jan Walter, ...* ***Jana Sobotová*** *Jana Sobotová (Gar.)*	Z,ZK	4	2P+2L	*	P
2341014	**Technology II.** ***Pavel Novák***	Z,ZK	5	2P+0C+2L	*	P
TV-1	**Physical Education**	Z	1		Z	P
2012035	**Algorithmization and Programming Fundamentals** *Jan Halama, Martin Hanek, Vladimír Prokop, David Trdlička, Marta Čertíková, Olga Majlingová, Petr Sváček, Vladimír Hric, Jan Karel, ...* ***Petr Sváček*** *Petr Sváček (Gar.)*	KZ	4	1P+2C	*	P

Characteristics of the courses of this group of Study Plan: Code=03P1/B2342--/FSI23P Name=3. B TZSI

2182019	Chemistry	KZ	3
General chemistry from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties of matter, thermodynamics, phase equilibrium, chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochemistry. Laboratory practice is oriented upon the material properties measurement.			
2011009	Mathematics III	Z,ZK	5
An introductory course in ordinary differential equation and infinite series.			
2311101	Mechanics I.	Z,ZK	4
Mechanics I deals with the basic concepts of statics. There are described the methods of solution of equilibrium of particles and rigid bodies and their systems with and without friction. There are introduced the methods of description of position and motion of particles and rigid bodies.			
2121502	Fluid Dynamics	Z,ZK	5
2321039	Materials Science II.	Z,ZK	4
Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and thermo-mechanical processing, technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.			
2341014	Technology II.	Z,ZK	5
mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planing.			
TV-1	Physical Education	Z	1
2012035	Algorithmization and Programming Fundamentals	KZ	4
Programming in MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matrices, vectors and operations. Writting M-script. Input and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. Systems of linear equations. Scripts and functions. Structure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Structures. Algorithmization of simple programs: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems of linear equations.			

Code of the group: 05P1/B2342--/FSI23P
Name of the group: 5. B TZSI
Requirement credits in the group: In this group you have to gain 26 credits
Requirement courses in the group: In this group you have to complete 6 courses
Credits in the group: 26
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2131512	**Machine Elements and Mechanisms I.** ***František Lopot***	Z,ZK	6	3P+2C	*	P
2141504	**Electric Circuits and Electronics** *Stanislava Papežová, Jan Chyský, Jaroslav Novák, Lukáš Novák* ***Zuzana Sedlecká*** *Jan Chyský (Gar.)*	Z,ZK	4	2P+0C+1L	*	P

2311107	**Mechanics III.** ***Tomáš Vampola***	Z,ZK	7	2P+3C	5	P
2111103	**Strenght of Materials II** *Miroslav Španiel, Jan Řezníček, Tomáš Mareš, Karel Doubrava, Ctirad Novotný, Zdeněk Padovec, Michal Bartošák, Jiří Kuželka, Martin Nesládek, ...* ***Tomáš Mareš*** *Miroslav Španiel (Gar.)*	Z,ZK	5	3P+3C	Z	P
2372083	**Measurement in Engineering** *Martin Novák, Vladimír Hlaváč* ***Martin Novák*** *Martin Novák (Gar.)*	KZ	3	1P+0C+2L	*	P
2153005	**Fundamentals of Energy Conversions** ***Jan Havlík***	Z	1	1P+1C	*	P

Characteristics of the courses of this group of Study Plan: Code=05P1/B2342--/FSI23P Name=5. B TZSI

2131512	Machine Elements and Mechanisms I.	Z,ZK	6
Joints and joining elements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters, keys). Mechanical transmissions (belt, chain, friction, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded connecting bolts, clamped, pressed, splined and key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple assembly units is also indispensable seminar work.			
2141504	Electric Circuits and Electronics	Z,ZK	4
Introduction into theory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy. El. Power and Energy. Introduction into electronics. Principle and typical parameters of basic semiconductor components. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Principle of analogue and digital signal processing. Logical circuits, converters, microprocessor.			
2311107	Mechanics III.	Z,ZK	7
Mechanics III deals with the basic concepts of dynamics. Methods of solving the dynamics of mass particle and body motion and their systems are described. Methods for describing and solving vibrations of systems.			
2111103	Strenght of Materials II	Z,ZK	5
This course is to provide an advanced analysis of machine members. It also provides the prerequisite for other special courses concerning the theory of elasticity and plasticity.			
2372083	Measurement in Engineering	KZ	3
Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and verification of measurement instruments.			
2153005	Fundamentals of Energy Conversions	Z	1

Code of the group: 06P1/B2342--/FSI21P
Name of the group: 6. B TZSI
Requirement credits in the group: In this group you have to gain 18 credits
Requirement courses in the group: In this group you have to complete 5 courses
Credits in the group: 18
Note on the group:

Code	**Name of the course / Name of the group of courses** ***(in case of groups of courses the list of codes of their members)*** *Tutors,* ***authors*** *and guarantors (gar.)*	**Completion**	**Credits**	**Scope**	**Semester**	**Role**
2131026	**Machine Elements and Mechanisms II** *František Lopot, Karel Petr, Zdeněk Češpíro, Eliška Cézová, Martin Dub, Jan Flek, Jan Kanaval, Jiří Houkal* ***František Lopot*** *František Lopot (Gar.)*	ZK	3	3P+0C	*	P
2141505	**Electrical machines and drives** *Jan Chyský, Jaroslav Novák* ***Jaroslav Novák*** *Jaroslav Novák (Gar.)*	Z,ZK	4	2P+0C+1L	*	P
2133025	**Design** *František Lopot* ***František Lopot*** *František Lopot (Gar.)*	Z	4	0P+4C	*	P
2181026	**Momentum, Mass and Heat Transfer** *Martin Dostál, Vojtěch Bělohlav, Stanislav Solnař, Jan Skočilas, Tomáš Jirout, Adam Krupica, Jiří Moravec* ***Tomáš Jirout*** *Tomáš Jirout (Gar.)*	Z,ZK	5	3P+1C	*	P
2383001	**Fundamentals of Law** *Václav Pilík Václav Pilík (Gar.)*	Z	2	1P+1C	*	P

Characteristics of the courses of this group of Study Plan: Code=06P1/B2342--/FSI21P Name=6. B TZSI

2131026	Machine Elements and Mechanisms II	ZK	3
Preliminary design, design calculations and aplication of axles and shafts, sliding and rolling bearings, shaft connections, elements of crank mechanism, pipelines and their accessories and fittings.			
2141505	Electrical machines and drives	Z,ZK	4
AC el. curcuits. Electrical power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transformer, principle, construction, 3-phase transformer, operating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-torque characteristic, speed control. Synchronous machines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque characteristic. Low-voltage instruments. Low-voltage distribution system.			
2133025	Design	Z	4
Design, design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft couplings and clutches.			
2181026	Momentum, Mass and Heat Transfer	Z,ZK	5
Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical energy equation. Residence time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and thermal radiation. Multicomponent systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.			

2383001	Fundamentals of Law	Z	2

Basic orientation in legal system is a necessary part of professional equipment of each expert with university degree. The aim of this course is to provide a view into the Czech Legal Order, particular sources of law and system of law (branch of law), using tutorials, lectures, specialised literature and significant legal regulations. It is necessary for students to know our legal institutions, that will be regularly in touch with, especially during their professional career and to learn how to work with the collection of laws. At the same time the course leads students to know some practical habits and processes while putting the law on, especially in domain of contracts and other important legal relationships and to make them ready to prepare professional presentations and to understand basic structures between law and engineering

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 19
The role of the block: PV

Code of the group: 03Q1/B2342--/FSI18P
Name of the group: 3. B TZSI
Requirement credits in the group: In this group you have to gain 2 credits
Requirement courses in the group: In this group you have to complete at least 1 course (at most 4)
Credits in the group: 2
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2023013	**Practical Class in Physics I** *Tomáš Horažďovský, Zuzana Budinská, Petr Ducháček, Jan Koller **Zuzana Budinská***	Z	2	0P+2C		PV
2013044	**Mathematics Repetitory** *Jan Halama, Milana Kittlerová, Luděk Beneš, Jiří Holman Ivana Linkeová (Gar.)*	Z	2	0P+2C	*	PV
2133013	**Engineering Design III.** *František Lopot, Roman Uhlíř, Jan Hoidekr, Jan Kanaval, David Skalický **Jan Kanaval** Jan Kanaval (Gar.)*	Z	2	0P+2C	Z	PV
2013066	**Basics of Stochastics** *Gejza Dohnal **Gejza Dohnal** Gejza Dohnal (Gar.)*	Z	2	0P+2C	*	PV

Characteristics of the courses of this group of Study Plan: Code=03Q1/B2342--/FSI18P Name=3. B TZSI

2023013	Practical Class in Physics I	Z	2

The subject is inteded for students who need more detailed practising and improvement (including knowledge from former physics coursess, or high-school knowledge) necessary for successful finishing Physics I course.The instructions are analogical to seminars with a short corresponding theoretical background. The link between physical concepts and methods of solution of typical problems is underlying.

2013044	Mathematics Repetitory	Z	2

Lessons are intended for students who expect problems at exams from mathematics. Lessons have a form of seminary with a short introduction to theory and a variety of exercises ranging sometimes even from level of grammar school and aimed mainly to Mathematics I and III.

2133013	Engineering Design III.	Z	2

Design of assembly unit (draft drawing, detail drawing, assembly drawing, technical report)

2013066	Basics of Stochastics	Z	2

Students will learn the basics of probability theory (random experiment, probability, random variable, probability distribution, characteristics of random variables, probability models, multivariate random variable and its characteristics, laws of large numbers and limit theorems) and the basic principles of statistical inference (frequency analysis, parameter estimation , hypothesis testing, regression analysis and more). The application of this knowledge we can found in all areas where it is necessary to evaluate the results of experiments, perform parameter estimation based on measurements, application of stochastic simulation methods, prediction of random processes and time series assessment. Also important is the use of these methods for the control of quality, reliability and risk assessment.

Code of the group: 04Q1/B2342--/FSI19P
Name of the group: 4. B TZSI
Requirement credits in the group: In this group you have to gain 2 credits
Requirement courses in the group: In this group you have to complete at least 1 course (at most 11)
Credits in the group: 2
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2213014	**Transportation and Aerospace Technology** ***Zdeněk Novák*** *Oldřich Vítek (Gar.)*	Z	2	0P+2C	L	PV
2323014	**Materials of the 21st Century** *Jan Krčil, Taťana Vacková, Ladislav Cvrček **Ladislav Cvrček** Ladislav Cvrček (Gar.)*	Z	2	0P+2C		PV
2383020	**Modern Management of Businesses and Projects** *Miroslav Žilka, Pavel Scholz **Miroslav Žilka** Miroslav Žilka (Gar.)*	Z	2	0P+2C		PV

2333040	**Perspective Production in Engineering** *Antonín Kříž, Pavel Rohan **Pavel Rohan** Pavel Rohan (Gar.)*	Z	2	0P+2C	4	PV
2183014	**Progressive Processes of Energy Utilization** *Jan Skočilas, Tomáš Jirout, Vladimír Zmrhal, Michal Kolovratník, Lukáš Krátký **Tomáš Jirout** Jan Skočilas (Gar.)*	Z	2	0P+2C	*	PV
2353041	**Practical introduction to production machines** *Petr Vavruška **Petr Vavruška** Petr Vavruška (Gar.)*	Z	2	0P+2C+0L		PV
2023012	**Practical Class in Physics II** *Tomáš Horažďovský, Zuzana Budinská, Petr Ducháček, Jan Koller **Zuzana Budinská** Tomáš Horažďovský (Gar.)*	Z	2	0P+2C		PV
2343040	**Manufactory** *Pavel Novák (Gar.)*	Z	2	0P+2C		PV
2133014	**Engineering Design IV.** *František Lopot **František Lopot** František Lopot (Gar.)*	Z	2	0P+2C	L	PV
2313040	**Introduction into applied mechanics and mechatronics** *Václav Bauma, Zbyněk Šika, Michael Valášek, Vladimír Prokop, Tomáš Hyhlík, Petr Beneš, Ivo Bukovský, Jan Pelikán, Jan Zavřel, ... **Michael Valášek** Michael Valášek (Gar.)*	Z	2	0P+2C	*	PV
2373040	**Robot Control Introduction** ***Jakub Jura** Pavel Trnka (Gar.)*	Z	2	0P+0C+2L	*	PV

Characteristics of the courses of this group of Study Plan: Code=04Q1/B2342--/FSI19P Name=4. B TZSI

2213014	Transportation and Aerospace Technology	Z	2

Design and testing of ground transportation vehicles, control systems, aircraft structures and propulsions. Selected topics of transportation and aerospace technology are presented in seminars and by means of laboratory exercises. Information about possibility of master study and project work at CTU, trainee and internship in reputable firms, both in transportation and aerospace technology.

2323014	Materials of the 21st Century	Z	2

The subject is focused on characterization of structural and functional materials, which are currently used in technical practice. Attention is paid to technological methods of production of advanced materials, prediction and own evaluation of their properties. In addition, development trends for individual types of materials are discussed

2383020	Modern Management of Businesses and Projects	Z	2

The main objective of the course is to introduce students to modern trends and approaches that have emerged in corporate governance in recent years and will shape the future. The course introduces the main technical and technological trends that will significantly transform the industry, its economic, environmental benefits and risks in the near future. The second main topic represent information systems for management and planning of business processes and for support of managerial decision-making. Furthermore, the course deals with the issue of modern approaches and tools for production management and ends with issues of current trends in project management. The focus of the course is not to provide students with a detailed explanation, but to provide a general view of current trends and approaches in key areas of corporate governance. The required depth of individual areas is further developed within individual courses in the Master's degree program.

2333040	Perspective Production in Engineering	Z	2

The subject focuses on the teaching of advanced engineering technology, modern trends in production management, development of new advanced materials, testing of materials, energy production and presentation of the virtual factory. Classes will be a combination of practical nature of work in laboratories FS, instructional videos, and tours to the high-tech material-working.

2183014	Progressive Processes of Energy Utilization	Z	2

The scope of this subject is to introduce the fields of study in bachelor study programs "Engineering" and "Theoretical Fundamentals in Mechanical Engineering". Student gets knowledge of fundamentals in Environmental, Power and Process Engineering . In the field of Environmental Engineering, fundamentals of heating, ventilation, cooling, alternative sources of energy, separators and protection against dust and noise are presented. As for Power Engineering, heat and electricity production from fossil and renewable sources is presented, needs and applications of these energy forms in the industrial and private sectors are discussed. In the field of Process Engineering, technologies, machines and equipment in food, consumer and chemical industries, pharmacy, biotechnologies and waste treatment technologies are presented. Based on this information, student gets finally more detailed information during the processing of a brief seminar paper on selected topic, in which she/he is interested in.

2353041	Practical introduction to production machines	Z	2

The course offers a practical introduction to production machines including modern CNC technologies and the basics of design considerations of components produced on CNC machines. Students will acquire the necessary knowledge of the production cycle of basic types of production machines as well as CNC machining centres, including the design brief, technologies and production procedures used and determination of technological conditions. Students will also familiarize themselves with machine operation, possibilities of machine and tool adjustment, production proper, testing procedures and product measurement. Basic statistical and operational diagnostic methods of measurement will also be demonstrated (measurements of accuracy, force, noise, vibration, temperature etc.)

2023012	Practical Class in Physics II	Z	2

The subject is inteded for students who need more detailed practising and improvement (including knowledge from former physics coursess, or high-school knowledge) necessary for successful finishing Physics II course.The instructions are analogical to seminars with a short corresponding theoretical background. The link between physical concepts and methods of solution of typical problems is underlying.

2343040	Manufactory	Z	2

The course presents three basic competencies profiling the institute - machining, technological design, metrology and quality management systems. The course is realized in the form of seminars, laboratory exercises and excursions to industrial partners. In this way, students will get acquainted with the activities of the machining group in the areas of CNC machine programming, complex CAD / CAM systems, machining tools, conventional but also unconventional machining methods and additive technologies. In the field of technological design, students will be introduced to the principles and methodology for designing production processes and systems using modern methods of production preparation (Lean Production, Just In Time, Make or Buy) and advanced software for production preparation and planning. In the field of technological design with the issue of designing production processes and complex production systems. Within metrology and quality management systems, students will then be introduced to modern product quality control technologies in the field of coordinate measurement? dimensional and geometric tolerances, surface texture. In the form of professional excursions to industrial companies, students are demonstrated the practical role of the above competencies in the product life cycle? marketing, construction, technical preparation of production, engineering production and quality control. The course will be scheduled in 4-hour blocks, once every 14 days due to higher efficiency of teaching within individual teaching blocks and excursions.

2133014	Engineering Design IV.	Z	2
2313040	Introduction into applied mechanics and mechatronics	Z	2
2373040	Robot Control Introduction	Z	2

The class introduces basic concepts and principles of robotics. Students will use construction kit for design, assemble and programme the robot. This subject is recommended for students of the second year of the bachelor study. There is no prerequisite for this subject.

Code of the group: 05Q1/B2342--/FSI20P

Name of the group: 5. B TZSI - Oborový předmět I.
Requirement credits in the group: In this group you have to gain at least 3 credits (at most 5)
Requirement courses in the group: In this group you have to complete at least 1 course (at most 18)
Credits in the group: 3
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2371110	**Industrial Automation** *Lukáš Novák, Lubomír Musálek, Šárka Němcová, Jakub Jura, Pavel Trnka, Jan Hošek, Matouš Cejnek, Michal Kuchař, Martin Vitoušek* ***Pavel Trnka*** *Pavel Trnka (Gar.)*	Z,ZK	4	2P+2C+0L		PV
2211130	**Transport Engineering** *Josef Kolář* ***Josef Kolář*** *Josef Kolář (Gar.)*	Z,ZK	4	2P+2C+0L	*	PV
2121047	**Hydro a Thermodynamics** *Michal Schmirler* ***Tomáš Hyhlík*** *Tomáš Hyhlík (Gar.)*	Z,ZK	4	2P+2C		PV
2221221	**Aeronautics and Astronautics** *Svatomír Slavík, Jaroslav Kousal, Jan Klesa, Tomáš Čenský Svatomír Slavík (Gar.)*	Z,ZK	4	2P+2C+0L		PV
2011715	**Mathematical Modeling in Technical Applications** *Jan Halama, Ivana Linkeová, Martin Hanek, Vladimír Prokop, David Trdlička, Jan Valášek, Luděk Beneš, Tomáš Bodnár, Jiří Fürst, ... Jiří Fürst (Gar.)*	Z,ZK	3	2P+2C	*	PV
2381006	**Methods and Tools for Managerial Decisionmaking** ***Miroslav Žilka***	Z,ZK	3	2P+2C		PV
2151705	**Renewables energy sources**	Z,ZK	4	2P+2C		PV
2181125	**Process equipment and production lines** *Radek Šulc, Lukáš Krátký* ***Lukáš Krátký*** *Lukáš Krátký (Gar.)*	Z,ZK	3	2P+2C		PV
2341001	**Metrology** ***Pavel Novák***	Z,ZK	5	2P+0C+2L	*	PV
2321500	**Technical Materials I** *Jana Sobotová, Jan Krčil, Vladimír Mára, Taťana Vacková, Jakub Horník, Elena Čižmárová, Jakub Horváth, Zdeňka Jeníková, Stanislav Krum* ***Stanislav Krum*** *Stanislav Krum (Gar.)*	Z,ZK	4	2P+2C+0L		PV
2161022	**Environmental Engineering** *Jiří Bašta* ***Jiří Bašta*** *Jiří Bašta (Gar.)*	Z,ZK	4	2P+2C+0L	5	PV
2331075	**Design Consideration** *Pavel Rohan, Aleš Herman, Pavel Novák, Ladislav Kolařík, Bohumír Bednář, František Tatíček* ***Bohumír Bednář*** *Bohumír Bednář (Gar.)*	Z,ZK	4	2P+2C+0L		PV
2131060	**Transport Technology** *František Lopot, Roman Uhlíř, Zdeněk Češpíro, Jan Hoidekr* ***Zdeněk Češpíro*** *František Lopot (Gar.)*	Z,ZK	4	2P+2C+0L	Z	PV
2021014	**Physics - Selected Topics**	Z,ZK	3	2P+2C		PV
2311083	**Selected Topics of Mechanics and Mechatronics** *Václav Bauma, Zbyněk Šika, Michael Valášek, Pavel Steinbauer* ***Michael Valášek*** *Michael Valášek (Gar.)*	Z,ZK	4	2P+2C+0L		PV
2351094	**Production Technology** *Jan Smolík, Vladimír Andrlík, Tomáš Krannich* ***Vladimír Andrlík*** *Vladimír Andrlík (Gar.)*	Z,ZK	4	2P+2C+0L		PV

Characteristics of the courses of this group of Study Plan: Code=05Q1/B2342--/FSI20P Name=5. B TZSI - Oborový předmět I.

2371110	Industrial Automation	Z,ZK	4

In this course, students will learn the basic principles of automated systems used in current industrial practice, especially focused on the use of advanced procedures in the spirit of the Industry 4.0 initiative. Specifically, these are PLCs and PLC networks, Distributed Control Systems (DCS) and Distributed Artificial Intelligence (DAI), Robotic Manufacturing Systems (RMS), Use of controlled drives, Industrial sensors, Micro machining, Methods of system integration and MES systems, Human Machine Interface (HMI) and SCADA Systems (Visualization and Data Collection), Databases and cyber security, Data analysis, Machine vision (including optical processing and image preprocessing) and Machine learning.

2211130	Transport Engineering	Z,ZK	4

Road and rail transport systems - characteristics, distribution and application vehicles. Characteristics of transport routes and dimensions of vehicles on the track link. Driving resistance and traction characteristics of the vehicles. Analysis of the driving cycle. Internal combustion engines - classification, characteristics, characteristics. Methods of power transmission with a drive mechanism. The function of basic structural units and groups of vehicles.

2121047	Hydro a Thermodynamics	Z,ZK	4
2221221	Aeronautics and Astronautics	Z,ZK	4

The course is intended as an introductory course in the field of aircraft technology for bachelor students. The course serves as a theoretical support of the project and bachelor thesis in the field of aircraft technology aimed at aircraft structures, engines and space. The first block is focused on obtaining an overview of aircraft structures and their operating loads, aircraft materials, production technologies and aircraft systems. The second block introduces the basics of aerodynamics. The follow-up enginer section deals with the principles and types of aircraft propulsion units. The space section presents input information inthe field of space technology.

2011715	Mathematical Modeling in Technical Applications	Z,ZK	3

Introduction to mathematic models for basic engineering problems. Basic principles of solution by means of mathematical modeling, numerical mathematics and current computers. This course will introduce finite difference, finite volume and finite element methods including different topology of domain discretization (meshes). Numerical simulations will be aimed at the solution of engineering problems of continuum mechanics.

2381006	Methods and Tools for Managerial Decisionmaking	Z,ZK	3
The course is oriented to project management approach. During the course are solved cases that respond to practical situations. The cases are stressed on cost-returns calculations, on the solving interactions among costs, capacity of resources and the price. And also on the calculation typical kinds of variations and their explanation and the selection of the appropriate managerial decision. The students are concerning on the right way of operational budget creation and assessment. The link on the internal company accounting is shown and explain. The computerized models are used by explanation.			
2151705	Renewables energy sources	Z,ZK	4
The course deals with overview of the currently used renewable energy sources. In a wider context, it concerns with their domestic as well as world-wide potential, possibilities of their utilization and possible impacts on the environment. The course discusses in deeper details some of them, especially are emphasized the source having the highest potential in the Czech Republic this is mostly hydropower, wind energy, solar energy and energy from biomass. Other renewable energy sources are to a smaller extent discussed as well, e.g. geothermal energy, tidal energy, etc.			
2181125	Process equipment and production lines	Z,ZK	3
2341001	Metrology	Z,ZK	5
Metrology, intergration into quality control, legal metrology, metrology system. Geometrical quantities metrology. Measurement uncertainty. Primary and secondary standarts. Measurement in 1, 2, end 3 coordinates. Laserinterferometres and their applications. Geometrical surface properties. Form - and position deviations. Surface structure - roughness, wawiness. Measurement automatisation.			
2321500	Technical Materials I	Z,ZK	4
2161022	Environmental Engineering	Z,ZK	4
Application of a theory in environmental engineering			
2331075	Design Consideration	Z,ZK	4
Relations between construction, production technology and economic aspects. Product design with regard to casting, forming, welding, machining and assembly technologies. The basis for choosing material and technology. Structural modifications of parts with regard to quality and production possibilities. Use of CNC technology.			
2131060	Transport Technology	Z,ZK	4
2021014	Physics - Selected Topics	Z,ZK	3
The subject gives students a deeper and wider knowledge of selected parts of fundamental physics courses with respect to usage of physical phenomena in technological applications (for example lasers, electron beams, roentgen diffraction, thermophysical properties of matter). Students can achieve and deepen their knowledge in solid state physics, liquids and they will be acquainted with modern method of diagnostics of their properties. The subject professionally profile students for a physical topics in a future study program Applied sciences in Mechanical Engineering.			
2311083	Selected Topics of Mechanics and Mechatronics	Z,ZK	4
2351094	Production Technology	Z,ZK	4
Manufacturing machines and equipment contains three basic parts. These are forming machines, machine tools and industrial robots and manipulators. Characteristics of machines and equipment for realization of discrete technological processes will be explained, technical parameters, basics of construction of production machines and equipment, OS, TS design, automation of production machines and equipment, industrial manipulators and robots, their applications, single-purpose and modular machines, production lines. Examples of applications of production machines and equipment.			

Code of the group: 06Q1/B2342--/FSI19P
Name of the group: 6. B TZSI - Oborový projekt II.
Requirement credits in the group: In this group you have to gain 4 credits
Requirement courses in the group: In this group you have to complete at least 1 course (at most 18)
Credits in the group: 4
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2382122	**Branch Project II.**	KZ	4	0P+4C+0L		PV
2372122	**Branch Project II.** ***Vladimír Hlaváč*** *Vladimír Hlaváč (Gar.)*	KZ	4	0P+4C+0L		PV
2022122	**Branch Project II.** *Zuzana Budinská* ***Zuzana Budinská***	KZ	4	0P+4C+0L		PV
2112122	**Branch Project II.** *Miroslav Španiel, Jan Řezníček, Tomáš Mareš, Karel Doubrava, Ctirad Novotný, Zdeněk Padovec, Michal Bartošák, Jiří Kuželka, Martin Nesládek, ... **Tomáš Mareš** Miroslav Španiel (Gar.)*	KZ	4	0P+4C+0L		PV
2122122	**Branch Project II.** *Hana Schmirlerová, Jakub Suchý, Pavel Sláma, Michal Schmirler Michal Schmirler (Gar.)*	KZ	4	0P+4C+0L		PV
2132122	**Branch Project II.** *František Lopot, Karel Petr, Marek Štádler, Roman Uhlíř, Václav Čvančara, Zdeněk Češpíro, Eliška Cézová, Martin Dub, Jan Flek, ... **František Lopot** František Lopot (Gar.)*	KZ	4	0P+4C+0L		PV
2152122	**Branch Project II.** *Michal Kolovratník, Matěj Vodička, Jan Špale, Jan Syblík, Michal Cihlář, Pavel Skopec, Jakub Maščuch, Jan Opatřil, Václav Novotný, ... **Jan Štěpánek***	KZ	4	0P+4C+0L		PV
2162122	**Branch Project II.** *Vladimír Zmrhal, Roman Vavřička, Martin Barták, Vojtěch Zavřel **Martin Barták** Martin Barták (Gar.)*	KZ	4	0P+4C+0L	6	PV
2182122	**Branch Project II.** *Radek Šulc, Stanislav Solnař, Jan Skočilas, Tomáš Jirout, Jiří Moravec, Lukáš Krátký, Jaromír Štancl **Lukáš Krátký** Lukáš Krátký (Gar.)*	KZ	4	0P+4C+0L		PV

2212122	**Branch Project II.** *Petr Hatschbach, Gabriela Achtenová, Oldřich Vítek, Josef Kolář, Václav Jirovský, Libor Červenka, Jan Baněček, Vít Beránek, Ivan Bortel, ... **Petr Hatschbach** Oldřich Vítek (Gar.)*	KZ	4	0P+4C+0L	*	PV
2222122	**Branch Project II.** *Milan Dvořák, Jaroslav Kousal, Jan Klesa, Tomáš Čenský, Jaromír Kučera, Jakub Valenta, Jiří Teichman, Aleš Kratochvíl Milan Dvořák (Gar.)*	KZ	4	0P+4C+0L		PV
2242122	**Branch Project II.** *Matej Daniel, Lukáš Horný, Hynek Chlup, Jakub Kronek, Kristýna Kubášová **Matej Daniel** Matej Daniel (Gar.)*	KZ	4	0P+4C+0L		PV
2312122	**Branch project II.** *Václav Bauma, Zbyněk Šika, Michael Valášek, Pavel Steinbauer, Jan Zavřel **Michael Valášek** Michael Valášek (Gar.)*	KZ	4	0P+4C+0L	*	PV
2322122	**Branch Project II.** *Jana Sobotová, Jiří Cejp, Pavlína Hájková, Jan Krčil, Vladimír Mára, Taťana Vacková, Jakub Horník, Ladislav Cvrček, Elena Čižmárová, ... **Petr Špatenka** Petr Špatenka (Gar.)*	KZ	4	0P+4C+0L		PV
2332122	**Branch project II.** *Aleš Herman **Aleš Herman** Aleš Herman (Gar.)*	KZ	4	0P+4C+0L		PV
2342122	**Branch Project II.** *Jiří Kyncl Jan Podaný (Gar.)*	KZ	4	0P+4C+0L		PV
2352122	**Branch Project II.** *Vladimír Andrlík, Tomáš Krannich, Michal Fürbacher **Vladimír Andrlík** Vladimír Andrlík (Gar.)*	KZ	4	0P+4C+0L		PV
2012122	**Branch Project II.** *Jan Halama, Ivana Linkeová, Marta Hlavová, Vladimír Prokop, Jan Valášek, Luděk Beneš, Tomáš Bodnár, Jiří Fürst, Radka Keslerová, ... **Jiří Fürst** Jiří Fürst (Gar.)*	KZ	4	0P+4C+0L	*	PV

Characteristics of the courses of this group of Study Plan: Code=06Q1/B2342--/FSI19P Name=6. B TZSI - Oborový projekt II.

2382122	Branch Project II.	KZ	4
2372122	Branch Project II.	KZ	4
Individual preparation for a future bachelor thesis. Main task is a research of problematics, preparation of experiments, introduction on equipment, data collection etc. As a result, student prepares a short report about his advances in the work.			
2022122	Branch Project II.	KZ	4
The conception of the subject is on an individual base the topics are related to the professional profile of students. Students are guided to the application of possessed knowledge in solution of a given problem together with an individual approach. The achieved results are presented in the end of semester, if they are supposed to be a part of bachelor thesis.			
2112122	Branch Project II.	KZ	4
2122122	Branch Project II.	KZ	4
2132122	Branch Project II.	KZ	4
2152122	Branch Project II.	KZ	4
Design, construction, project of a simple facility, device, machine, etc., from the field of compressors, cooling techniques, thermal insulation.			
2162122	Branch Project II.	KZ	4
Project, dimensioning and designing solution of basic elements for heating, ventilation and air conditioning plants, devices for air pollution control, air feed and systems with recoverable source of heat.			
2182122	Branch Project II.	KZ	4
Theoretical introduction to selected technologies of process technology with a subsequent excursion. The work on a semester project focused on the issue of machines and apparatus for the food, chemical, processing and ecology industries.			
2212122	Branch Project II.	KZ	4
Project training in solution of design task based on industry requirements.			
2222122	Branch Project II.	KZ	4
The Branch Project assignment is largely based on the practical needs of the industry or the research and development objectives of the university. The content is a structural design of a selected part of the airplane structure including the creation of a 3D model of the designed structure, determination of the loading and the stress analysis, proposition and execution of experiment on designed part of structure (if required). The conclusion is a technical report describing the proposed solution			
2242122	Branch Project II.	KZ	4
2312122	Branch project II.	KZ	4
2322122	Branch Project II.	KZ	4
2332122	Branch project II.	KZ	4
2342122	Branch Project II.	KZ	4
Work on specialized tasks.			
2352122	Branch Project II.	KZ	4
The course is focused on elaboration of individual work, which student solves in close cooperation with the head of the assigned topic. The student will get acquainted with the problems of manufacturing machines and the equipment, respectively its parts according to the orientation of their work, and during regular weekly consultations with the supervisor proceed in professional solution of the problem. At the end of the semester students present their work on small oral examination in which they present the work performed, the coherence and meaning.			
2012122	Branch Project II.	KZ	4
Course consists of individual assignment. Student works under the guidance of supervisor. Regular meetings with supervisor are supposed each week of semestr. Student prepares the written report describing methods and results.			

Code of the group: 06Q2/B2342--/FSI19P
Name of the group: 6. B TZSI - Bakalářská práce
Requirement credits in the group: In this group you have to gain 8 credits
Requirement courses in the group: In this group you have to complete at least 1 course (at most 18)

Credits in the group: 8
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
2183992	**Bachelor Thesis** *Radek Šulc, Martin Dostál, Vojtěch Bělohlav, Stanislav Solnař, Jan Skočilas, Tomáš Jirout, Jiří Moravec, Lukáš Krátký, Jaromír Štancl* ***Tomáš Jirout*** *Tomáš Jirout (Gar.)*	Z	8	0P+8C		PV
2373992	**Thesis** ***Vladimír Hlaváč*** *Tomáš Vyhlídal (Gar.)*	Z	8	0P+8C	*	PV
2383992	**Bachelor Thesis** ***František Freiberg*** *František Freiberg (Gar.)*	Z	8	0P+2C		PV
2013992	**Bachelor Thesis** *Jan Halama, Ivana Linkeová, Marta Hlavová, Jan Valášek, Luděk Beneš, Tomáš Bodnár, Jiří Fürst, Radka Keslerová, Olga Majlingová, ... Jiří Fürst (Gar.)*	Z	8	0P+8C	*	PV
2023992	**Bachelor Thesis** *Zuzana Budinská* ***Zuzana Budinská***	Z	8	0P+8C		PV
2113992	**Bachelor Thesis** *Miroslav Španiel, Jan Řezníček, Tomáš Mareš, Karel Doubrava, Ctirad Novotný, Martin Nesládek, Karel Vítek* ***Tomáš Mareš*** *Miroslav Španiel (Gar.)*	Z	8	0P+8C		PV
2313992	**Bachelor Thesis** *Václav Bauma, Zbyněk Šika, Michael Valášek, Pavel Bastl, Petr Beneš, Ivo Bukovský, Martin Nečas, Zdeněk Neusser, Jan Pelikán, ...* ***Michael Valášek*** *Michael Valášek (Gar.)*	Z	8	0P+8C		PV
2133992	**Bachelor Thesis** *František Lopot, Jakub Milan Hradecký* ***František Lopot*** *František Lopot (Gar.)*	Z	8	0P+8C		PV
2153992	**Bachelor thesis** *Michal Kolovratník, Matěj Vodička, Jan Špale, Jan Syblík, Michal Cihlář, Pavel Skopec, Jakub Maščuch, Jan Opatřil, Václav Novotný, ...* ***Jan Štěpánek***	Z	8	0P+8C		PV
2163992	**Bachelor Thesis** *Vladimír Šulc* ***Vladimír Zmrhal*** *Vladimír Zmrhal (Gar.)*	Z	8	0P+8C	6	PV
2213992	**Bachelor Thesis** *Petr Hatschbach, Gabriela Achtenová, Oldřich Vítek, Josef Kolář, Václav Jirovský, Jan Baněček, Vít Beránek, Ivan Bortel, Vít Doleček, ...* ***Petr Hatschbach*** *Oldřich Vítek (Gar.)*	Z	8	0P+8C	*	PV
2223992	**Thesis** *Milan Dvořák (Gar.)*	Z	8	0P+8C		PV
2243992	**Bachelor Thesis** *Matej Daniel, Lukáš Horný* ***Matej Daniel*** *Matej Daniel (Gar.)*	Z	8	0P+8C		PV
2323992	**Bachelor thesis** *Zdeňka Jeníková* ***Jana Sobotová*** *Jana Sobotová (Gar.)*	Z	8	0P+8C		PV
2333992	**Bachelor thesis** *Antonín Kříž, Pavel Rohan, Barbora Bryksí Stunová, Aleš Herman, Jiří Kuchař, Ladislav Kolařík, Bohumír Bednář, František Tatíček, Jan Čermák, ...* ***Ladislav Kolařík*** *Ladislav Kolařík (Gar.)*	Z	8	0P+8C		PV
2343992	**Thesis** *Jan Podaný (Gar.)*	Z	8	0P+8C		PV
2353992	**Bachelor Thesis** ***Vladimír Andrlík*** *Petr Kolář (Gar.)*	Z	8	0P+8C+0L		PV
2123992	**Thesis, Department of Fluid Dynamics and Thermodynamics** *Michal Schmirler Michal Schmirler (Gar.)*	Z	8	0P+8C		PV

Characteristics of the courses of this group of Study Plan: Code=06Q2/B2342--/FSI19P Name=6. B TZSI - Bakalářská práce

2183992	Bachelor Thesis	Z	8
2373992	Thesis	Z	8
Each student will solve his individual theme under guiding of his individual supervising department specialist. Result is his/her bachelor thesis.			
2383992	Bachelor Thesis	Z	8
2013992	Bachelor Thesis	Z	8
2023992	Bachelor Thesis	Z	8
The aim of the subject is to inform students with all general rules of final thesis formation and due to the regular consultations with own thesis supervisor to continue in professional solution of a given problem and on preparation of the own text of final thesis. Individual and active approach of students is expected.			
2113992	Bachelor Thesis	Z	8
2313992	Bachelor Thesis	Z	8
2133992	Bachelor Thesis	Z	8
2153992	Bachelor thesis	Z	8
Bachelor thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.			
2163992	Bachelor Thesis	Z	8
Bachelor Thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.			
2213992	Bachelor Thesis	Z	8

2223992	Thesis	Z	8
The Bachelor Thesis assignment is largely based on the practical needs of the industry or the research and development objectives of the university. The content is a structural design of a selected part of the airplane structure including the creation of a 3D model of the designed structure, determination of the loading and the stress analysis, proposition and execution of the experiment with designed part of structure under the leadership of consultants and supervisors of the work (if required). Working out of the bachelor work.			
2243992	Bachelor Thesis	Z	8
2323992	Bachelor thesis	Z	8
2333992	Bachelor thesis	Z	8
2343992	Thesis	Z	8
Sources of information in the field. Databases and corporate literature. Normalization. Search activity. News from the field of engineering technology. Principles of research and work in laboratories. The principles of work safety in technological devices. Work on specialized tasks related to the focus of a thesis.			
2353992	Bachelor Thesis	Z	8
The course focuses on processing the final thesis within the scope of the assigned topic of the bachelor thesis. The student is acquainted with the general principles of the final thesis and during regular weekly consultations with the supervisor proceeds in the professional solution of the assigned problem and at the same time works on the actual text of the final thesis. In the course of the solution, the student completes a small oral presentation where the work in progress is presented.			
2123992	Thesis, Department of Fluid Dynamics and Thermodynamics	Z	8

Name of the block: Jazyky
Minimal number of credits of the block: 2
The role of the block: J

Code of the group: 04J2/B2342--/FSI15P
Name of the group: 4. B TZSI
Requirement credits in the group: In this group you have to gain 2 credits
Requirement courses in the group: In this group you have to complete at least 1 course (at most 5)
Credits in the group: 2
Note on the group:

Code	**Name of the course / Name of the group of courses** ***(in case of groups of courses the list of codes of their members)*** *Tutors,* ***authors*** *and guarantors (gar.)*	**Completion**	**Credits**	**Scope**	**Semester**	**Role**
2041061	**English-Bachelor Exam** *Ilona Šimice, Michaela Schusová, Hana Volejníková, Veronika Kratochvílová, Michele Le Blanc Ilona Šimice (Gar.)*	Z,ZK	2	0P+2C	*	J
2041063	**French - Bachelor Exam /FME** *Michaela Schusová, Dušana Jirovská* ***Eliška Vítková*** *Dušana Jirovská (Gar.)*	Z,ZK	2	0P+2C	*	J
2041062	**German - Bachelor Exam / FME** *Michaela Schusová, Jaroslava Kommová, Eliška Vítková, Petr Laurich* ***Jaroslava Kommová*** *Jaroslava Kommová (Gar.)*	Z,ZK	2	0P+2C	*	J
2041065	**Russian - Bachelor Exam / FME** *Michaela Schusová, Hana Volejníková, Dušana Jirovská* ***Eliška Vítková*** *Dušana Jirovská (Gar.)*	Z,ZK	2	0P+2C	*	J
2041064	**Spanish - Bachelor Exam / FME** *Michaela Schusová, Jaime Andrés Villagómez* ***Eliška Vítková*** *Jaime Andrés Villagómez (Gar.)*	Z,ZK	2	0P+2C	*	J

Characteristics of the courses of this group of Study Plan: Code=04J2/B2342--/FSI15P Name=4. B TZSI

2041061	English-Bachelor Exam	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041063	French - Bachelor Exam /FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041062	German - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041065	Russian - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041064	Spanish - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
2011009	Mathematics III	Z,ZK	5
	An introductory course in ordinary differential equation and infinite series.		
2011018	Constructive Geometry	Z,ZK	5
	The subject is focused on geometric objects in the space - curves, surfaces and solids and their properties and mutual relations.		
2011067	Mathematics I.	Z,ZK	6
	In the course, greater emphasis is placed on the theoretical basis of the concepts discussed and on the derivation of basic relationships and connections between concepts. Students will also get to know the procedures for solving problems with parametric input. In addition, students will gain extended knowledge in some thematic areas: eigennumbers and eigenvectors of a matrix, Taylor polynomial, integral as a limit function, integration of some special functions.		
2011068	Mathematics II.	Z,ZK	6
	Open and closed set, boundary in E^k. Real function of k-variables. Partial derivatives and differentiability. Gradient and directional derivative. Differential operators div (divergence) and curl (rotation). Function given implicitly. Local and global (= absolute) extremes of a function of more variables. Double integral, volume (=triple) integral, Fubini theorem. Transformation of integrals to polar, cylindrical and spherical coordinates. A simple smooth curve and line integral of a scalar and vector function. Circulation and Green's theorem. A potential vector field, independence of a line integral on the path. Simple smooth surface and surface integral of a scalar function and a vector function. Flow of a vector field through a surface. The Gauss-Ostrogradskij theorem.		
2011715	Mathematical Modeling in Technical Applications	Z,ZK	3
	Introduction to mathematic models for basic engineering problems. Basic principles of solution by means of mathematical modeling, numerical mathematics and current computers. This course will introduce finite difference, finite volume and finite element methods including different topology of domain discretization (meshes). Numerical simulations will be aimed at the solution of engineering problems of continuum mechanics.		
2012035	Algorithmization and Programming Fundamentals	KZ	4
	Programming in MATLAB and its programming language. MATLAB command line. Elementary commands, variable, assignment and expression. Matrices, vectors and operations. Writting M-script. Input and output. Condition and cycle. Algorithmization of simple problems in MATLAB. Graphical commands. Matrix operations. Systems of linear equations. Scripts and functions. Structure of program. Variables, expressions, assignment, and input / output commands. switch. For cycle. Arrays and files. Pointers. Structures. Algorithmization of simple programs: minimum, mean, norm, numerical integration, bisection method, Newton method, matrix operations. Direct methods for solution of systems of linear equations.		
2012122	Branch Project II.	KZ	4
	Course consists of individual assignment. Student works under the guidance of supervisor. Regular meetings with supervisor are supposed each week of semestr. Student prepares the written report describing methods and results.		
2013044	Mathematics Repetitory	Z	2
	Lessons are intended for students who expect problems at exams from mathematics. Lessons have a form of seminary with a short introduction to theory and a variety of exercises ranging sometimes even from level of grammar school and aimed mainly to Mathematics I and III.		
2013066	Basics of Stochastics	Z	2
	Students will learn the basics of probability theory (random experiment, probability, random variable, probability distribution, characteristics of random variables, probability models, multivariate random variable and its characteristics, laws of large numbers and limit theorems) and the basic principles of statistical inference (frequency analysis, parameter estimation , hypothesis testing, regression analysis and more). The application of this knowledge we can found in all areas where it is necessary to evaluate the results of experiments, perform parameter estimation based on measurements, application of stochastic simulation methods, prediction of random processes and time series assessment. Also important is the use of these methods for the control of quality, reliability and risk assessment.		
2013992	Bachelor Thesis	Z	8
2021014	Physics - Selected Topics	Z,ZK	3
	The subject gives students a deeper and wider knowledge of selected parts of fundamental physics courses with respect to usage of physical phenomena in technological applications (for example lasers, electron beams, roentgen diffraction, thermophysical properties of matter). Students can achieve and deepen their knowledge in solid state physics, liquids and they will be acquainted with modern method of diagnostics of their properties. The subject professionally profile students for a physical topics in a future study program Applied sciences in Mechanical Engineering.		
2021026	Physics I	Z,ZK	5
	Kinematics and dynamics of a particle motion. Principle of conservation of energy. System of particles, centre of mass. Rigid body. Continuum, elastic properties of bodies. Oscillations, waves. Fluid mechanics. Temperature and heat transfer. Kinetic theory of gases. Thermodynamics. Electric field, current, conductivity, resistance. Conductors, semiconductors, insulators. Magnetic field. Magnetic materials. Laboratories - accuracy of measurements, systematic and random errors, uncertainty of direct and indirect measurements, regression, measurement of experiments related to the lectures.		
2021027	Physics II	Z,ZK	4
	Faraday's law of electromagnetic induction. Maxwell's equations, electromagnetic waves. Light, wave optics, geometrical optics. Quantum properties of electromagnetic waves. Interaction of radiation with matter. Photoelectric effect. Wave-particle mature of matter. Quantum-mechanical description of particle's motion. Hydrogen atom and periodic system of elements. Spectra, x-rays, ;laser. Band theory of solids, semiconductors. Nucleus, radioactivity, sources of nuclear energy. Laboratories - measurements of 6 experiments related to the lectures.		
2022122	Branch Project II.	KZ	4
	The conception of the subject is on an individual base the topics are related to the professional profile of students. Students are guided to the application of possessed knowledge in solution of a given problem together with an individual approach. The achieved results are presented in the end of semester, if they are supposed to be a part of bachelor thesis.		
2023012	Practical Class in Physics II	Z	2
	The subject is inteded for students who need more detailed practising and improvement (including knowledge from former physics coursess, or high-school knowledge) necessary for successful finishing Physics II course.The instructions are analogical to seminars with a short corresponding theoretical background. The link between physical concepts and methods of solution of typical problems is underlying.		
2023013	Practical Class in Physics I	Z	2
	The subject is inteded for students who need more detailed practising and improvement (including knowledge from former physics coursess, or high-school knowledge) necessary for successful finishing Physics I course.The instructions are analogical to seminars with a short corresponding theoretical background. The link between physical concepts and methods of solution of typical problems is underlying.		
2023992	Bachelor Thesis	Z	8
	The aim of the subject is to inform students with all general rules of final thesis formation and due to the regular consultations with own thesis supervisor to continue in professional solution of a given problem and on preparation of the own text of final thesis. Individual and active approach of students is expected.		

2041061	English-Bachelor Exam	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041062	German - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041063	French - Bachelor Exam /FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041064	Spanish - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2041065	Russian - Bachelor Exam / FME	Z,ZK	2
Mapped to the Common European Framework Level B2. The aim is to understand spoken language and lectures on technical topics without greater difficulties, to take part in discussions, to write a summary, a report and an essay, to read technical texts, to master grammar at advanced level.			
2111103	Strenght of Materials II	Z,ZK	5
This course is to provide an advanced analysis of machine members. It also provides the prerequisite for other special courses concerning the theory of elasticity and plasticity.			
2112122	Branch Project II.	KZ	4
2113992	Bachelor Thesis	Z	8
2121046	Thermomechanics	Z,ZK	5
Basic laws of thermodynamics. State equation of ideal gas. Ideal and semi-ideal gases and their properties. Reversible and typical irreversible processes of ideal and semi-ideal gases. Mixtures of gases. Real gases and vapours, reversible and irreversible processes. Cycles of typical motors and machines. Moist air. Fundamentals of chemical thermodynamics. Thermodynamics of chemical reactions. Basic cases of heat transfer. Steady heat conduction. Heat convection. Similarity, a criterion equation. Heat transfer during phase changes. Thermal radiation. Combined cases of heat transfer. Heat exchangers.			
2121047	Hydro a Thermodynamics	Z,ZK	4
2121502	Fluid Dynamics	Z,ZK	5
2122122	Branch Project II.	KZ	4
2123992	Thesis, Department of Fluid Dynamics and Thermodynamics	Z	8
2131026	Machine Elements and Mechanisms II	ZK	3
Preliminary design, design calculations and aplication of axles and shafts, sliding and rolling bearings, shaft connections, elements of crank mechanism, pipelines and their accessories and fittings.			
2131060	Transport Technology	Z,ZK	4
2131512	Machine Elements and Mechanisms I.	Z,ZK	6
Joints and joining elements (screwed, clamped, splined, welded, riveted, soldered and adhesive joints; joints with use of feathers, pins, tenons, cotters, keys). Mechanical transmissions (belt, chain, friction, gear drives). Seminars are devoted to practical individual solution of simple design projects - tasks with motion screws, preloaded connecting bolts, clamped, pressed, splined and key joints between shafts and hubs and tasks with welded and riveted joints. Sketching of machine elements and their simple assembly units is also indispensable seminar work.			
2132031	Engineering Design I.	KZ	3
Basic of technical representation, dimensioning and tolerancing.			
2132122	Branch Project II.	KZ	4
2133013	Engineering Design III.	Z	2
Design of assembly unit (draft drawing, detail drawing, assembly drawing, technical report)			
2133014	Engineering Design IV.	Z	2
2133025	Design	Z	4
Design, design calculations and their aplications in case of geared transmissions, axles and shafts, sliding and rolling bearings, shaft couplings and clutches.			
2133992	Bachelor Thesis	Z	8
2141504	Electric Circuits and Electronics	Z,ZK	4
Introduction into theory of electrical circuits, analysis special types of electrical circuits as DC and AC. Transient states in circuits with accumulators of energy. El. Power and Energy. Introduction into electronics. Principle and typical parameters of basic semiconductor components. Application in electronic circuits (rectifier, stabilizer, power control, operational amplifier). Analogue and digital circuits. Principle of analogue and digital signal processing. Logical circuits, converters, microprocessor.			
2141505	Electrical machines and drives	Z,ZK	4
AC el. curcuits. Electrical power and energy. Calculation, measurement, power factor. Magnetic circuit, materials, hysteresis loop. Electromagnet. Transformer, principle, construction, 3-phase transformer, operating conditions, rated (scheduled) values. Induction machine, principle, construction, operating conditions. Starting, speed-torque characteristic, speed control. Synchronous machines. DC-machines, principle, parameters, operating conditions, construction, starting, speed control, speed-torque characteristic. Low-voltage instruments. Low-voltage distribution system.			
2151705	Renewables energy sources	Z,ZK	4
The course deals with overview of the currently used renewable energy sources. In a wider context, it concerns with their domestic as well as world-wide potential, possibilities of their utilization and possible impacts on the environment. The course discusses in deeper details some of them, especially are emphasized the source having the highest potential in the Czech Republic this is mostly hydropower, wind energy, solar energy and energy from biomass. Other renewable energy sources are to a smaller extent discussed as well, e.g. geothermal energy, tidal energy, etc.			
2152122	Branch Project II.	KZ	4
Design, construction, project of a simple facility, device, machine, etc., from the field of compressors, cooling techniques, thermal insulation.			
2153005	Fundamentals of Energy Conversions	Z	1
2153992	Bachelor thesis	Z	8
Bachelor thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.			
2161022	Environmental Engineering	Z,ZK	4
Application of a theory in environmental engineering			

2162122	Branch Project II.	KZ	4
Project, dimensioning and designing solution of basic elements for heating, ventilation and air conditioning plants, devices for air pollution control, air feed and systems with recoverable source of heat.			
2163992	Bachelor Thesis	Z	8
Bachelor Thesis is final individual work. This work checks ability of logical independent technical thinking and treatment with technical materials. There is applied acquired knowledge from previous study periods.			
2181026	Momentum, Mass and Heat Transfer	Z,ZK	5
Fundamentals of transport phenomena balances in homogeneous fluids. Navier-Stokes equations. Momentum transport in turbulent flows. Mechanical energy equation. Residence time distributions in continuous systems. Conduction heat transfer. Forced and natural convection heat transfer. Heat transfer with phase changes and thermal radiation. Multicomponent systems. Mass transfer by molecular diffusion, convection, with chemical reactions and interphase mass transfer.			
2181125	Process equipment and production lines	Z,ZK	3
2182019	Chemistry	KZ	3
General chemistry from the point of view of mechanical and process engineering. Physical chemistry forms 2/3 of the course (structure and properties of matter, thermodynamics, phase equilibrium, chemical reactions, reaction engineering), the remaining 1/3 is devoted to organic chemistry (hydrocarbons, polymers) and biochemistry. Laboratory practice is oriented upon the material properties measurement.			
2182122	Branch Project II.	KZ	4
Theoretical introduction to selected technologies of process technology with a subsequent excursion. The work on a semester project focused on the issue of machines and apparatus for the food, chemical, processing and ecology industries.			
2183014	Progressive Processes of Energy Utilization	Z	2
The scope of this subject is to introduce the fields of study in bachelor study programs "Engineering" and "Theoretical Fundamentals in Mechanical Engineering". Student gets knowledge of fundamentals in Environmental, Power and Process Engineering . In the field of Environmental Engineering, fundamentals of heating, ventilation, cooling, alternative sources of energy, separators and protection against dust and noise are presented. As for Power Engineering, heat and electricity production from fossil and renewable sources is presented, needs and applications of these energy forms in the industrial and private sectors are discussed. In the field of Process Engineering, technologies, machines and equipment in food, consumer and chemical industries, pharmacy, biotechnologies and waste treatment technologies are presented. Based on this information, student gets finally more detailed information during the processing of a brief seminar paper on selected topic, in which she/he is interested in.			
2183992	Bachelor Thesis	Z	8
2211130	Transport Engineering	Z,ZK	4
Road and rail transport systems - characteristics, distribution and application vehicles. Characteristics of transport routes and dimensions of vehicles on the track link. Driving resistance and traction characteristics of the vehicles. Analysis of the driving cycle. Internal combustion engines - classification, characteristics, characteristics. Methods of power transmission with a drive mechanism. The function of basic structural units and groups of vehicles.			
2212122	Branch Project II.	KZ	4
Project training in solution of design task based on industry requirements.			
2213014	Transportation and Aerospace Technology	Z	2
Design and testing of ground transportation vehicles, control systems, aircraft structures and propulsions. Selected topics of transportation and aerospace technology are presented in seminars and by means of laboratory exercises. Information about possibility of master study and project work at CTU, trainee and internship in reputable firms, both in transportation and aerospace technology.			
2213992	Bachelor Thesis	Z	8
2221221	Aeronautics and Astronautics	Z,ZK	4
The course is intended as an introductory course in the field of aircraft technology for bachelor students. The course serves as a theoretical support of the project and bachelor thesis in the field of aircraft technology aimed at aircraft structures, engines and space. The first block is focused on obtaining an overview of aircraft structures and their operating loads, aircraft materials, production technologies and aircraft systems. The second block introduces the basics of aerodynamics. The follow-up enginer section deals with the principles and types of aircraft propulsion units. The space section presents input information inthe field of space technology.			
2222122	Branch Project II.	KZ	4
The Branch Project assignment is largely based on the practical needs of the industry or the research and development objectives of the university. The content is a structural design of a selected part of the airplane structure including the creation of a 3D model of the designed structure, determination of the loading and the stress analysis, proposition and execution of experiment on designed part of structure (if required). The conclusion is a technical report describing the proposed solution			
2223992	Thesis	Z	8
The Bachelor Thesis assignment is largely based on the practical needs of the industry or the research and development objectives of the university. The content is a structural design of a selected part of the airplane structure including the creation of a 3D model of the designed structure, determination of the loading and the stress analysis, proposition and execution of the experiment with designed part of structure under the leadership of consultants and supervisors of the work (if required). Working out of the bachelor work.			
2242122	Branch Project II.	KZ	4
2243992	Bachelor Thesis	Z	8
2311083	Selected Topics of Mechanics and Mechatronics	Z,ZK	4
2311101	Mechanics I.	Z,ZK	4
Mechanics I deals with the basic concepts of statics. There are described the methods of solution of equilibrium of particles and rigid bodies and their systems with and without friction. There are introduced the methods of description of position and motion of particles and rigid bodies.			
2311107	Mechanics III.	Z,ZK	7
Mechanics III deals with the basic concepts of dynamics. Methods of solving the dynamics of mass particle and body motion and their systems are described. Methods for describing and solving vibrations of systems.			
2312122	Branch project II.	KZ	4
2313028	Career in Engineering	Z	2
The goal is to teach the principles of engineering, tits fundamental concepts, personal profile and career procedure in industrial enterprize.			
2313040	Introduction into applied mechanics and mechatronics	Z	2
2313992	Bachelor Thesis	Z	8
2321039	Materials Science II.	Z,ZK	4
Fundamentals of metallurgy, iron-carbon alloys and influence of other elements, phase transformations, thermal, combined chemical and thermal and thermo-mechanical processing, technical iron-carbon alloys, non-ferrous metals and their alloys, plastics, structural ceramics, composites, selection of materials.			
2321500	Technical Materials I	Z,ZK	4

2322029	Materials Science I.	KZ	3
History and present state of materials engineering, overview of technical materials, internal structure of metals, crystal lattices and their defects, deformation, recrystallization and fracture of materials, structure and properties of materials and their testing, fundamentals of thermodynamics, phases and phase transformations, iron-carbon phase diagram.			
2322122	Branch Project II.	KZ	4
2323014	Materials of the 21st Century	Z	2
The subject is focused on characterization of structural and functional materials, which are currently used in technical practice. Attention is paid to technological methods of production of advanced materials, prediction and own evaluation of their properties. In addition, development trends for individual types of materials are discussed			
2323992	Bachelor thesis	Z	8
2331075	Design Consideration	Z,ZK	4
Relations between construction, production technology and economic aspects. Product design with regard to casting, forming, welding, machining and assembly technologies. The basis for choosing material and technology. Structural modifications of parts with regard to quality and production possibilities. Use of CNC technology.			
2332122	Branch project II.	KZ	4
2333008	Fundamental of Technology I.	Z	2
2333040	Perspective Production in Engineering	Z	2
The subject focuses on the teaching of advanced engineering technology, modern trends in production management, development of new advanced materials, testing of materials, energy production and presentation of the virtual factory. Classes will be a combination of practical nature of work in laboratories FS, instructional videos, and tours to the high-tech material-working.			
2333992	Bachelor thesis	Z	8
2341001	Metrology	Z,ZK	5
Metrology, intergration into quality control, legal metrology, metrology system. Geometrical quantities metrology. Measurement uncertainty. Primary and secondary standarts. Measurement in 1, 2, end 3 coordinates. Laserinterferometres and their applications. Geometrical surface properties. Form - and position deviations. Surface structure - roughness, wawiness. Measurement automatisation.			
2341014	Technology II.	Z,ZK	5
mechanics of chip formation, cutting processes, finishing operations, non-traditional machining processes. Production rates calculation, machining economics. Automation of processes, programming of manufacture. Engineering metrology. Assembly techniques. Introduction to process planing.			
2342122	Branch Project II.	KZ	4
Work on specialized tasks.			
2343010	Fundamentals of Technology II.	Z	2
Introduction to machining. Principle of cutting process. Working parameters. Cutting tools - general characteristics, geometry, designation and symbols. The basic machining processes, their mechanics, equipment, conditions, material removal rate determination. The shapes produced, commercial tolerance and surface finish obtained. Laboratories.			
2343040	Manufactory	Z	2
The course presents three basic competencies profiling the institute - machining, technological design, metrology and quality management systems. The course is realized in the form of seminars, laboratory exercises and excursions to industrial partners. In this way, students will get acquainted with the activities of the machining group in the areas of CNC machine programming, complex CAD / CAM systems, machining tools, conventional but also unconventional machining methods and additive technologies. In the field of technological design, students will be introduced to the principles and methodology for designing production processes and systems using modern methods of production preparation (Lean Production, Just In Time, Make or Buy) and advanced software for production preparation and planning. In the field of technological design with the issue of designing production processes and complex production systems. Within metrology and quality management systems, students will then be introduced to modern product quality control technologies in the field of coordinate measurement? dimensional and geometric tolerances, surface texture. In the form of professional excursions to industrial companies, students are demonstrated the practical role of the above competencies in the product life cycle? marketing, construction, technical preparation of production, engineering production and quality control. The course will be scheduled in 4-hour blocks, once every 14 days due to higher efficiency of teaching within individual teaching blocks and excursions.			
2343992	Thesis	Z	8
Sources of information in the field. Databases and corporate literature. Normalization. Search activity. News from the field of engineering technology. Principles of research and work in laboratories. The principles of work safety in technological devices. Work on specialized tasks related to the focus of a thesis.			
2351094	Production Technology	Z,ZK	4
Manufacturing machines and equipment contains three basic parts. These are forming machines, machine tools and industrial robots and manipulators. Characteristics of machines and equipment for realization of discrete technological processes will be explained, technical parameters, basics of construction of production machines and equipment, OS, TS design, automation of production machines and equipment, industrial manipulators and robots, their applications, single-purpose and modular machines, production lines. Examples of applications of production machines and equipment.			
2352122	Branch Project II.	KZ	4
The course is focused on elaboration of individual work, which student solves in close cooperation with the head of the assigned topic. The student will get acquainted with the problems of manufacturing machines and the equipment, respectively its parts according to the orientation of their work, and during regular weekly consultations with the supervisor proceed in professional solution of the problem. At the end of the semester students present their work on small oral examination in which they present the work performed, the coherence and meaning.			
2353041	Practical introduction to production machines	Z	2
The course offers a practical introduction to production machines including modern CNC technologies and the basics of design considerations of components produced on CNC machines. Students will acquire the necessary knowledge of the production cycle of basic types of production machines as well as CNC machining centres, including the design brief, technologies and production procedures used and determination of technological conditions. Students will also familiarize themselves with machine operation, possibilities of machine and tool adjustment, production proper, testing procedures and product measurement. Basic statistical and operational diagnostic methods of measurement will also be demonstrated (measurements of accuracy, force, noise, vibration, temperature etc.)			
2353992	Bachelor Thesis	Z	8
The course focuses on processing the final thesis within the scope of the assigned topic of the bachelor thesis. The student is acquainted with the general principles of the final thesis and during regular weekly consultations with the supervisor proceeds in the professional solution of the assigned problem and at the same time works on the actual text of the final thesis. In the course of the solution, the student completes a small oral presentation where the work in progress is presented.			
2371110	Industrial Automation	Z,ZK	4
In this course, students will learn the basic principles of automated systems used in current industrial practice, especially focused on the use of advanced procedures in the spirit of the Industry 4.0 initiative. Specifically, these are PLCs and PLC networks, Distributed Control Systems (DCS) and Distributed Artificial Intelligence (DAI), Robotic Manufacturing Systems (RMS), Use of controlled drives, Industrial sensors, Micro machining, Methods of system integration and MES systems, Human Machine Interface (HMI) and SCADA Systems (Visualization and Data Collection), Databases and cyber security, Data analysis, Machine vision (including optical processing and image preprocessing) and Machine learning.			
2372041	Computer Support for Study	KZ	3
The course introduces students into creating technical and professional documents on computers or Web and into realizing technical computations with the use of computers. Students gain practical skills by creating an essay in a text editor, by realizing technical computations with a spreadsheet calculator, and by creating technical-based WWW page.			

2372083	Measurement in Engineering	KZ	3
Overview of sensor principles for measurement of non-electrical variables (temperature, position, force, speed, acceleration, torque). Calibration and verification of measurement instruments.			
2372122	Branch Project II.	KZ	4
Individual preparation for a future bachelor thesis. Main task is a research of problematics, preparation of experiments, introduction on equipment, data collection etc. As a result, student prepares a short report about his advances in the work.			
2373040	Robot Control Introduction	Z	2
The class introduces basic concepts and principles of robotics. Students will use construction kit for design, assemble and programme the robot. This subject is recommended for students of the second year of the bachelor study. There is no prerequisite for this subject.			
2373992	Thesis	Z	8
Each student will solve his individual theme under guiding of his individual supervising department specialist. Result is his/her bachelor thesis.			
2381006	Methods and Tools for Managerial Decisionmaking	Z,ZK	3
The course is oriented to project management approach. During the course are solved cases that respond to practical situations. The cases are stressed on cost-returns calculations, on the solving interactions among costs, capacity of resources and the price. And also on the calculation typical kinds of variations and their explanation and the selection of the appropriate managerial decision. The students are concerning on the right way of operational budget creation and assessment. The link on the internal company accounting is shown and explain. The computerized models are used by explanation.			
2381054	Management and Economics of the Enterprise	Z,ZK	4
The subject is intended to teach the students of the Faculty of Mechanical Engineering the basic economic starting points necessary for technical reasoning and to help them understand the basic relationships between economic quantities costs - revenues, expenses - incomes and other basic economic terms. The goal is for the audience to be able to communicate with economists in organizations. every product or service is valued at a selling price and therefore it is necessary to understand the simple costing of products and services. Every technician will encounter reports and should understand the basic structure of financial statements. As a future manager, he will compile and approve the operating budget. In the field of management, they will learn basic managerial functions and their content. Furthermore, they will learn how to use network analysis in project management. For decision-making purposes, they will learn the applications of multi-criteria decision-making. The basics of marketing and strategic management will be introduced.			
2382122	Branch Project II.	KZ	4
2383001	Fundamentals of Law	Z	2
Basic orientation in legal system is a necessary part of professional equipment of each expert with university degree. The aim of this course is to provide a view into the Czech Legal Order, particular sources of law and system of law (branch of law), using tutorials, lectures, specialised literature and significant legal regulations. It is necessary for students to know our legal institutions, that will be regularly in touch with, especially during their professional career and to learn how to work with the collection of laws. At the same time the course leads students to know some practical habits and processes while putting the law on, especially in domain of contracts and other important legal relationships and to make them ready to prepare professional presentations and to understand basic structures between law and engineering			
2383020	Modern Management of Businesses and Projects	Z	2
The main objective of the course is to introduce students to modern trends and approaches that have emerged in corporate governance in recent years and will shape the future. The course introduces the main technical and technological trends that will significantly transform the industry, its economic, environmental benefits and risks in the near future. The second main topic represent information systems for management and planning of business processes and for support of managerial decision-making. Furthermore, the course deals with the issue of modern approaches and tools for production management and ends with issues of current trends in project management. The focus of the course is not to provide students with a detailed explanation, but to provide a general view of current trends and approaches in key areas of corporate governance. The required depth of individual areas is further developed within individual courses in the Master's degree program.			
2383992	Bachelor Thesis	Z	8
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1
TVK-L	Physical Education Course	Z	1

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