

Recommended pass through the study plan

Name of the pass: Bachelor Part-Time TET-LED from 2025/26

Faculty/Institute/Others:

Department:

Pass through the study plan: Bachelor TET-LED Part-Time from 2025/26

Branch of study guaranteed by the department: Welcome page

Guarantor of the study branch:

Program of study: Technology in Transportation and Telecommunications

Type of study: Bachelor combined

Note on the pass: zahájení studia 2025/26

Coding of roles of courses and groups of courses:

P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):

KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

| 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 |
|--------|---|------------|---------|-----------|----------|------|
| 14ASD | Algorithm and Data Structures Tomáš Brandejský, Michal Jeábek, Alena Kubáková, Jan Procházka, Vít Fábera, Martin Fiala Vít Fábera Vít Fábera (Gar.) | KZ | 3 | 0P+2C+8B | Z | z |
| 11CAL1 | Calculus 1 Olga Vraštilová, Tomáš Tasák, Magdalena Hykšová, Bohumil Ková, Ondřej Navrátil Bohumil Ková Ondřej Navrátil (Gar.) | Z,ZK | 7 | 2P+4C+2B | Z | z |
| 11GIE | Geometry Oldřich Hykš, Pavel Provinský, Šárka Voráková Oldřich Hykš Oldřich Hykš (Gar.) | KZ | 3 | 2P+2C+12B | Z | z |
| 11LA | Linear Algebra Pavel Provinský, Lucie Kárná, Martina Bevková Martina Bevková Martina Bevková (Gar.) | Z,ZK | 3 | 2P+1C+10B | Z | z |
| 18MTY | Materials Science and Engineering Jaromír Kýlar, Veronika Drechslerová, Jaromír Kýlar, Nela Králová, Jitka Ježníková, Jaroslav Valach, Vít Malinovský, Veronika Drechslerová, Jaromír Kýlar Jaroslav Valach Jaroslav Valach (Gar.) | Z,ZK | 3 | 2P+1C+10B | Z | z |
| 18TKK | Technical Drawing and Designing Jitka Ježníková, Vít Malinovský, Jan Šleicher, Martin Brumovský, Jan Mejstřík, Drahomír Schmidt, Lukáš Svoboda, Jan Vogl, Jiří Zeisek, Jan Šleicher Jan Šleicher (Gar.) | KZ | 4 | 2P+2C+16B | Z | z |
| 16UDOP | Introduction into Vehicles Zuzana Radová, Petr Bouchner | Z | 2 | 2P+0C+8B | Z | z |
| 12ZADK | Introduction to Transportation Engineering Dagmar Kořírková, Jana Stikarová | Z,ZK | 5 | 12B | Z | z |

Number of semester: 2

| 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 |
|--------|--|------------|---------|-----------|----------|------|
| 11CAL2 | Calculus 2 Olga Vraštilová, Tomáš Tasák, Magdalena Hykšová, Ondřej Navrátil, Oldřich Hykš Magdalena Hykšová Ondřej Navrátil (Gar.) | Z,ZK | 5 | 2P+3C+20B | L | z |
| 14PRG | Programming Alena Kubáková, Jan Procházka, Martin Fiala, Lukáš Svoboda, Jana Kalíková, Jan Král Jana Kalíková Jana Kalíková (Gar.) | KZ | 2 | 0P+2C+8B | L | z |
| 18SAT | Structural Analysis Jaromír Kýlar, Veronika Drechslerová, Nela Králová, Jitka Ježníková, Jan Šleicher, Daniel Kytý, Jan Vyšehlí, Tomáš Doktor, Jan Fiala Daniel Kytý (Gar.) | Z,ZK | 4 | 2P+2C+14B | L | z |
| 11STAT | Statistics Pavel Provinský, Evžen Uglickich, Pavla Pecherková, Michal Matowicki, Natálie Blahitka, Ivan Nagy, Jana Kuklová Pavla Pecherková Evžen Uglickich (Gar.) | Z,ZK | 4 | 2P+2C+12B | L | z |
| 20SYSA | Systems Analysis Zuzana Bělínová, Jiří Růžička, Patrik Horažovský, Petr Bureš Zuzana Bělínová (Gar.) | Z,ZK | 5 | 2P+2C+14B | L | z |

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|--------|---|------|---|-----------|---|---|
| 17TEDK | Transport Technology and Logistics <i>Michal Drábek Michal Drábek (Gar.)</i> | KZ | 4 | 12B | L | z |
| 21ZALD | Basics of Air Transport <i>Jakub Hospodka, Tomáš Tluhoš, Jiří Volt, Peter Olexa, Jan Slezáček, Jakub Trýb, Sébastien Lán, Bo Stloukal</i> | KZ | 2 | 0P+2C+8B | L | z |
| 12ZTS | Railway Lines and Stations <i>Lukáš Týfa, Martin Jacura, Petr Šatra, Tomáš Javořík, Ondřej Trešl Lukáš Týfa (Gar.)</i> | Z,ZK | 4 | 2P+2C+10B | L | z |

Number of semester: 3

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|--------|--|------------|---------|-----------|----------|------|
| 15JZ1A | Foreign Language - English 1 <i>Markéta Vojanová, Dana Boušová, Marie Michlová, Marek Tomek, Jan Feit, Markéta Musilová, Peter Morpuss, Lenka Monková, Jitka Heřmanová,</i> | Z | 3 | 0P+4C+10B | Z | z |
| 14DATS | Database Systems <i>Jana Kalíková, Jan Král Jana Kalíková Jana Kalíková (Gar.)</i> | KZ | 2 | 1P+1C+10B | Z | z |
| 11FYZ | Physics <i>Oldřich Hykš, Jana Kuklová, Pavel Demo, Zuzana Malá, Tomáš Vít Jana Kuklová Pavel Demo (Gar.)</i> | Z,ZK | 5 | 2P+2C+18B | Z | z |
| 12MDE | Transport Models and Transport Excesses <i>Josef Kocourek, Tomáš Padělek</i> | Z,ZK | 3 | 2P+1C+8B | Z | z |
| 12PPOK | Designing Roads, Highways and Motorways <i>Josef Kocourek, Tomáš Padělek, Polina Zayats, Petr Kumpošt Josef Kocourek (Gar.)</i> | KZ | 3 | 1P+2C+10B | Z | z |
| 18PZP | Elasticity and Strength <i>Jitka Heřmanová, Jan Šleichrt, Daniel Kytý, Jan Vyhlídal, Tomáš Doktor, Josef Jíra, Ondřej Jiroušek Ondřej Jiroušek Ondřej Jiroušek (Gar.)</i> | Z,ZK | 3 | 2P+1C+10B | Z | z |
| 11TGA | Graph Theory and its Applications in Transport <i>Denisa Mocková, Dušan Teichmann Denisa Mocková Denisa Mocková (Gar.)</i> | Z,ZK | 4 | 2P+2C+12B | Z | z |
| 20UITS | Introduction to Intelligent Transport Systems <i>Jiří Růžka, Patrik Horažovský, Kristýna Navrátilová, Viktor Beneš, Eva Hajárová, Martin Langr, Vladimír Faltus, Pavel Hrubeš Martin Langr</i> | Z,ZK | 7 | 3P+2C+20B | Z | z |

List of groups of courses of this pass with the complete content of members of individual groups

List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|--|--|------------|---------|
| 11CAL1 | Calculus 1 | Z,ZK | 7 |
| Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Indefinite integral, Newton integral, Riemann integral, improper Riemann integral. First-order differential equations, linear differential equations. | | | |
| 11CAL2 | Calculus 2 | Z,ZK | 5 |
| Linear differential equations and their systems, differential calculus of functions of several real variables. Riemann integral in R_n . Line and surface integrals. | | | |
| 11FYZ | Physics | Z,ZK | 5 |
| Kinematics, dynamics, Newton's laws, force fields, mechanics of continuum, thermodynamics, introduction to electrostatics and electric current. | | | |
| 11GIE | Geometry | KZ | 3 |
| Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path. | | | |
| 11LA | Linear Algebra | Z,ZK | 3 |
| Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification. | | | |
| 11STAT | Statistics | Z,ZK | 4 |
| Basics of probability Descriptive statistics Population and sample, limit theorem Point estimate, construction and properties Interval estimates Parametric tests Nonparametric tests Regression and correlation analysis | | | |
| 11TGA | Graph Theory and its Applications in Transport | Z,ZK | 4 |
| Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines. | | | |

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| 12MDE | Transport Models and Transport Excesses | Z,ZK | 3 |
| Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency. | | | |
| 12PPOK | Designing Roads, Highways and Motorways | KZ | 3 |
| Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections. | | | |
| 12ZADK | Introduction to Transportation Engineering | Z,ZK | 5 |
| 12ZTS | Railway Lines and Stations | Z,ZK | 4 |
| Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport. | | | |
| 14ASD | Algorithm and Data Structures | KZ | 3 |
| Students will analyze problems, design a theoretical solution to a given problem and write the resulting algorithm using flowcharts, practice reading algorithms written using flowcharts, and use basic Boolean algebra to construct constraints in algorithms. Students will be introduced to the basics of the Python programming language - variable, branching, loops, they will learn to work with variables of basic data types (integer, floating point and string) and the list data structure in their programs. | | | |
| 14DATS | Database Systems | KZ | 2 |
| Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW. | | | |
| 14PRG | Programming | KZ | 2 |
| The Course Programming builds on and fully extends the course 14ASD (Algorithmization and Data Structures). The knowledge of the Python programming language is expanded here so that the participant gains skills and can apply them to solve various follow-up tasks. Main topics: lists, multidimensional arrays, sorting and searching, tuples, sets, dictionaries, working with date and time, regular expressions, functions and procedures, working with files (CSV, JSON, XML). | | | |
| 15JZ1A | Foreign Language - English 1 | Z | 3 |
| Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric. | | | |
| 16UDOP | Introduction into Vehicles | Z | 2 |
| Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation. | | | |
| 17TEDK | Transport Technology and Logistics | KZ | 4 |
| Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus. | | | |
| 18MTY | Materials Science and Engineering | Z,ZK | 3 |
| Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests. | | | |
| 18PZP | Elasticity and Strength | Z,ZK | 3 |
| Tension and compression. Bending of beam. Shear stress in bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joints of structures. Analysis of deflection curve of beams. Torsion of circular cross sections. Combined loading. Stability. | | | |
| 18SAT | Structural Analysis | Z,ZK | 4 |
| General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains. | | | |
| 18TKK | Technical Drawing and Designing | KZ | 4 |
| 20SYSA | Systems Analysis | Z,ZK | 5 |
| Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis. | | | |
| 20UITS | Introduction to Intelligent Transport Systems | Z,ZK | 7 |
| Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS. | | | |
| 21ZALD | Basics of Air Transport | KZ | 2 |
| History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies. | | | |

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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