

Study plan

Name of study plan: PL nav.kombi 22/23 (pro program PL)

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Air Traffic Control and Management

Type of study: Follow-up master combined

Required credits: 96

Elective courses credits: 24

Sum of credits in the plan: 120

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 80

The role of the block: Z

Code of the group: 1.S.NKPL 22/23

Name of the group: 1.sem.nav.kombi PL (od) 22/23 (program PL)

Requirement credits in the group: In this group you have to gain 28 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 28

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
11APAS	Applied Statistics Pavla Pecherková Pavla Pecherková	Z,ZK	4	2P+2C+12B	Z	Z
11MMJ	Mathematical Models and their Applications Pavla Pecherková, Evženie Uglickich Evženie Uglickich (Gar.)	Z,ZK	4	2P+2C+12B	Z	Z
21BILD	Safety Engineering in Aviation Andrej Lališ, Natalia Guskova, Kateřina Grötschelová Andrej Lališ	Z,ZK	4	2P+2C+12B	Z	Z
21CNSS	CNS Systems Stanislav Pleninger, Jakub Kraus, Petr Lukeš, Jakub Steiner Stanislav Pleninger	Z,ZK	5	3P+2C+16B	Z	Z
21LETS	Airport Petr Líka, Sébastien Lán, Petr Had Slobodan Stoji	Z,ZK	4	1P+2C+12B	Z	Z
21PEKL	Principles and Models in Air Transport Economics Peter Vittek, Eva Endrizalová Peter Vittek	Z,ZK	5	4P+2C+16B	Z	Z
15J2A1	Language - English 1 Markéta Musilová, Jitka He manová, Marie Michlová, Lenka Monková, Markéta Vojanová, Peter Mopuss, Jan Feit, Eva Rezlerová	Z	2	0P+2C+10B	Z	Z

Characteristics of the courses of this group of Study Plan: Code=1.S.NKPL 22/23 Name=1.sem.nav.kombi PL (od) 22/23 (program PL)

11APAS	Applied Statistics	Z,ZK	4	Descriptive statistics, data preprocessing, discretize continuous data. Hypothesis testing - continuous and discrete variables. Regression and correlation analysis. Multivariable methods - multiple regression analysis, logistic regression analysis, ROC curve, MANOVA, PCA, Factor analysis. Power analysis, preparation, processing and evaluation of hte experiment.
11MMJ	Mathematical Models and their Applications	Z,ZK	4	System. Regression, discrete and logistic models. Bayesian estimation of model parameters. Parameter estimation of normal regression, discrete and logistic models. Classification with logistic model. One-step and multi-step prediction with regression and discrete models. State model. State estimation. Kalman filter. Control with regression and discrete models.
21BILD	Safety Engineering in Aviation	Z,ZK	4	The course is focused on understanding the issue of safety, learning how to assess new systems in terms of safety and acquiring principles of safety management. Students will learn explaining accidents and incident causes and bridge their theoretical knowledge with practical problems of air transport.
21CNSS	CNS Systems	Z,ZK	5	Course provides full technical informations about CNS (communication, navigation, surveillance) systems used in aviation. Systems are presented in perspective of future development.
21LETS	Airport	Z,ZK	4	Methods of designing new airports and developing existing ones. Connection of the airport to the surrounding infrastructure. Airport economics. Detailed look at the development of movement areas. Certification of airside movement areas and procedures according to EASA CS-ADR-DSN. Development planning - design, preparation and regulatory basis. Environmental aspects of airport operations.

21PEKL	Principles and Models in Air Transport Economics	Z,ZK	5
The course contains the most important and typical models on which the economics of air transport is based. It covers the principles of regulation, airline infrastructure models, market structure, analyses airline costs, and looks in detail at the low-cost and charter airline model. It also focuses on airline alliances, air cargo, airline strategies and the economic principles of safety and security.			
15J2A1	Language - English 1	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			

Code of the group: 2.S.NKPL 22/23

Name of the group: 2.sem.nav.kombi PL (od) 22/23 (program PL)

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
21AFM	Air Traffic Management <i>Terézia Pilmannová Terézia Pilmannová</i>	Z,ZK	5	3P+2C+16B	L	Z
21MULD	Managerial Challenges in Air Transport <i>Petr Víttek, Eva Endrizalová</i>	Z,ZK	5	3P+2C+14B	L	Z
21PLET	Airport Operations <i>Petr Líka, Sébastien Lán, Petr Had, Jiří Volt, Tereza Dvořáková, Slobodan Stoji</i>	Z,ZK	5	2P+2C+12B	L	Z
21SPOL	Aircraft Technology Reliability <i>Natalia Guskova, Kateřina Grötschelová, Oldřich Štumberg</i>	Z,ZK	4	2P+1C+12B	L	Z
21PAM1	Programming and Modelling 1 <i>Vladimír Socha, Lenka Hanáková</i>	KZ	5	2P+4C+16B	L	Z
15JBA2	Language - English 2 <i>Markéta Musilová, Jitka Heřmanová, Marie Michlová, Lenka Monková, Markéta Vojanová, Peter Morpuss, Jan Feit, Eva Rezlerová</i>	Z	2	0P+2C+10B	L	Z

Characteristics of the courses of this group of Study Plan: Code=2.S.NKPL 22/23 Name=2.sem.nav.kombi PL (od) 22/23 (program PL)

21AFM	Air Traffic Management	Z,ZK	5
Current ATM system and its functional blocks. View of ATM data (technical architecture and configuration, transmission systems and networks). Data exchange with neighboring ATM systems. Monitoring systems and technical supervision. ATM simulation. ATM conceptions and strategies for next years. EUROCONTROL - CFMU. FAB. ATS's - AOC's data applications.			
21MULD	Managerial Challenges in Air Transport	Z,ZK	5
The course contains a list of basic managerial tasks in aviation. The basic managerial tasks are quality assurance and operational safety, marketing operations, marketing context implementation, airline network management, fleet management and revenue management. The core disciplines also include project management, cost management and project resource planning and management.			
21PLET	Airport Operations	Z,ZK	5
Planning, design and modelling of airport processes in airside, landside and terminal buildings. Impact of infrastructure and equipment on airport capacity. Available tools and practices for increasing capacity. Operational analytics, capacity and traffic load forecasting. Purpose and development of an airport masterplan.			
21SPOL	Aircraft Technology Reliability	Z,ZK	4
Subject deals with tuition of separate attributes of reliability (no failure, vitality, maintainability, and so on) and main criterions of safety of production and working of aerospace engineering. General legalities are in the framework of tuition demonstrated on the example of calculation of reliability of integral characteristics of materials and they are practical illustration of its security in The Czech Police Aviation Department.			
21PAM1	Programming and Modelling 1	KZ	5
Harmonic signals, their generation. Real signals, sampling theorem, aliasing. Signal filtering. Fourier transform (FT), discrete Fourier transform (DFT), fast Fourier transform (FFT). Spectrum estimation, spectral power density. Image - basic processing methods, 2D Fourier transform, noise filtering, edge detection, linear and non-linear methods, brightness transforms, geometric transforms, image compression.			
15JBA2	Language - English 2	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			

Code of the group: 3.S.NKPL 23/24

Name of the group: 3.sem.nav.kombi PL (od) 23/24 (program PL)

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 7 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11MMAA	Mathematical methods for data analysis <i>Pavla Pečerková</i>	Z,ZK	4	2P+2C+12B	Z	Z
21NSR	Navigation and Flight Control Systems <i>Jakub Hospodka Jakub Hospodka</i>	Z,ZK	5	3P+2C+14B	Z	Z

21PLDC	Air Carrier Operations	Z,ZK	5	3P+2C+16B	Z	Z
21PAM2	Programming and Modelling 2 <i>Vladimír Socha</i>	KZ	5	2P+4C+16B	Z	Z
21LIA1	Aviation Engineering English 1 <i>Jitka He manová</i>	Z	3	0P+2C+8B	Z	Z
21XNL1	Thesis seminar 1	Z	2	0P+1C+4B	Z	Z
15JBA3	Language - English 3 <i>Markéta Musilová, Jitka He manová, Marie Michlová, Lenka Monková, Markéta Vojanová, Peter Morpuss, Jan Feit, Eva Rezlerová, Marek Tomek,</i>	Z	2	0P+2C+10B	Z	Z

Characteristics of the courses of this group of Study Plan: Code=3.S.NKPL 23/24 Name=3.sem.nav.kombi PL (od) 23/24 (program PL)

11MMAA	Mathematical methods for data analysis Stochastic modelling, estimation, prediction, filtration, control, methods of data analysis - k-means, DBSCAN, naive Bayes, decision trees, support vector machine.	Z,ZK	4
21NSR	Navigation and Flight Control Systems Navigation. Radionavigation. Satellite navigation. Flight management system. Autopilot. FMC. Practical execution of flight.	Z,ZK	5
21PLDC	Air Carrier Operations Mission and importance of air transport. Legislation. Airlines - structure, strategy. Performances in air transport. Cost structure. Fuel management. Cargo. Aircraft maintenance (organization) and economics of aircraft operation. Ground handling and other services. Safety / Security / Quality and Compliance monitoring. Revenue management. Air transport and environment.	Z,ZK	5
21PAM2	Programming and Modelling 2 Descriptive statistics, classical statistical analysis. Statistical hypothesis testing. Analysis of variance (ANOVA), one-factor, two-factor ANOVA. Non-parametric methods. Linear regression. Correlation, correlation coefficient. Non-linear regression models, procedure for regression analysis of a non-linear model. Basics of machine learning. Classification by nearest neighbour method. SVM classifiers. Decision trees.	KZ	5
21LIA1	Aviation Engineering English 1 Lectures include various types of the language exercises and are focused on the following topics - EUR-Lex and European Legislation, ICAO Annexes and SARPs, AMCs and GMs, Civil Aviation Authorities, Accident investigation, Aircraft Airworthiness, Aircraft documentations and manuals, Medical certification, Emergency response plan.	Z	3
21XNL1	Thesis seminar 1 Introduction, scientific publications, publications devoted to scientific writing, grey literature, difference between bachelor and master thesis. Time management. Formal and graphic design, mathematical typesetting, typography, paragraphing, transitions between paragraphs. LaTeX. Research, databases, critical work with text, digital notes, working with notes, outline. Rhetorical exercises / presentation skills.	Z	2
15JBA3	Language - English 3 Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement. Optional courses for certificates FCE, CAE.	Z	2

Name of the block: Semestrální projekt

Minimal number of credits of the block: 8

The role of the block: ZP

Code of the group: XN PL 1-4 22/23

Name of the group: Projekty nav. 1.-4.sem (od) 22/23 programu PL (PRE i KOMBI)

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 4 courses

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
11XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
12XN1	Master Project 1 <i>Zuzana arská, Kristýna Neubergová, Iva Šturmová, Martin Jacura, Tomáš Javořík, Lukáš Týla, Jiří arský, Josef Kocourek, Tomáš Padleček,</i>	Z	2	0P+2C+4B	Z	ZP
14XN1	Master Project 1 <i>Tomáš Brandejský, Vít Fábera, Mária Jánešová, Jan Zelenka</i>	Z	2	0P+2C+4B	Z	ZP
15XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
16XN1	Master Project 1 <i>Josef Mík, Josef Svoboda, Pěmysl Toman, Dmitrij Rožděstvenský</i>	Z	2	0P+2C+4B	Z	ZP
17XN1	Master Project 1 <i>Václav Baroch, Edvard Bezina, Michal Drábek, Alexandra Dvořáková, Veronika Fajfrová, Tomáš Horák, Vít Janoš, Milan Kříž, Olga Mertlová,</i>	Z	2	0P+2C+4B	Z	ZP
18XN1	Master Project 1 <i>Radim Dvořák, Jaroslav Valach, Daniel Kytý, Petr Koudelka, Tomáš Fíla, Jan Šleiccht, Ján Kopačka, Radek Kolman</i>	Z	2	0P+2C+4B	Z	ZP
20XN1	Master Project 1 <i>Jiří Růžka, Patrik Horažďovský</i>	Z	2	0P+2C+4B	Z	ZP
21XN1	Master Project 1 <i>Andrej Lališ, Natalia Grötschelová, Jakub Kraus, Jakub Steiner, Peter Vittek, Terézia Pilmannová, Slobodan Stojić, Vladimír Socha,</i>	Z	2	0P+2C+4B	Z	ZP

22XN1	Master Project 1 <i>Tomáš Mi unek, Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zden k Svatý</i>	Z	2	0P+2C+4B	Z	ZP
23XN1	Master Project 1	Z	2	0P+2C+4B	Z	ZP
11XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
12XN2	Master Project 2 <i>Zuzana arská, Martin Jacura, Tomáš Javo ík, Lukáš Týfa, Ji í arský, Josef Kocourek, Tomáš Pad lek, Vojt ch Novotný, Petr Kumpošt,</i>	Z	2	0P+2C+8B	L	ZP
14XN2	Master Project 2 <i>Tomáš Brandejský, Vít Fábera, Mária Jánešová, Jan Zelenka Vít Fábera (Gar.)</i>	Z	2	0P+2C+8B	L	ZP
15XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
16XN2	Master Project 2 <i>Josef Mík, P emysl Toman, Petr Bouchner</i>	Z	2	0P+2C+8B	L	ZP
17XN2	Master Project 2 <i>Václav Baroch, Edvard B ezina, Michal Drábek, Veronika Fairová, Tomáš Horák, Vít Janoš, Milan K íž, Olga Mertlová, Zden k Michl,</i>	Z	2	0P+2C+8B	L	ZP
18XN2	Master Project 2 <i>Jaroslav Valach, Daniel Kytý, Tomáš Fila, Petr Zlámal Daniel Kytý Daniel Kytý (Gar.)</i>	Z	2	0P+2C+8B	L	ZP
20XN2	Master Project 2 <i>Patrik Horaž ovský</i>	Z	2	0P+2C+8B	L	ZP
21XN2	Master Project 2 <i>Andrej Lališ, Natalia Guskova, Kate ina Grötschelová, Jakub Kraus, Peter Vittek, Terézia Pilmannová, Slobodan Stoji, Lenka Hanáková, Jakub Hospodka</i>	Z	2	0P+2C+8B	L	ZP
22XN2	Master Project 2 <i>Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zden k Svatý, Jakub Nová ek</i>	Z	2	0P+2C+8B	L	ZP
23XN2	Master Project 2	Z	2	0P+2C+8B	L	ZP
11XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
12XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
14XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
15XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
16XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
17XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
18XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
20XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
21XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
22XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
23XN3L	Master Project 3	Z	2	0P+2C+8B	Z	ZP
11XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
12XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
14XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
15XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
16XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
17XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
18XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
20XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
21XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
22XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP
23XN4L	Master Project 4	Z	2	0P+5C+8B	L	ZP

Characteristics of the courses of this group of Study Plan: Code=XN PL 1-4 22/23 Name=Projekty nav. 1.-4.sem (od) 22/23 programu PL (PRE i KOMBI)

11XN1	Master Project 1	Z	2
12XN1	Master Project 1	Z	2
14XN1	Master Project 1	Z	2
15XN1	Master Project 1	Z	2
16XN1	Master Project 1	Z	2
17XN1	Master Project 1	Z	2
18XN1	Master Project 1	Z	2
20XN1	Master Project 1	Z	2
21XN1	Master Project 1	Z	2
22XN1	Master Project 1	Z	2
23XN1	Master Project 1	Z	2
11XN2	Master Project 2	Z	2

12XN2	Master Project 2	Z	2
14XN2	Master Project 2	Z	2
15XN2	Master Project 2	Z	2
16XN2	Master Project 2	Z	2
17XN2	Master Project 2	Z	2
18XN2	Master Project 2	Z	2
20XN2	Master Project 2	Z	2
21XN2	Master Project 2	Z	2
22XN2	Master Project 2	Z	2
23XN2	Master Project 2	Z	2
11XN3L	Master Project 3	Z	2
12XN3L	Master Project 3	Z	2
14XN3L	Master Project 3	Z	2
15XN3L	Master Project 3	Z	2
16XN3L	Master Project 3	Z	2
17XN3L	Master Project 3	Z	2
18XN3L	Master Project 3	Z	2
20XN3L	Master Project 3	Z	2
21XN3L	Master Project 3	Z	2
22XN3L	Master Project 3	Z	2
23XN3L	Master Project 3	Z	2
11XN4L	Master Project 4	Z	2
12XN4L	Master Project 4	Z	2
14XN4L	Master Project 4	Z	2
15XN4L	Master Project 4	Z	2
16XN4L	Master Project 4	Z	2
17XN4L	Master Project 4	Z	2
18XN4L	Master Project 4	Z	2
20XN4L	Master Project 4	Z	2
21XN4L	Master Project 4	Z	2
22XN4L	Master Project 4	Z	2
23XN4L	Master Project 4	Z	2

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 8

The role of the block: PV

Code of the group: Y2-NKPL 22/23

Name of the group: PVP nav.kombi program PL 22/23

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 4 courses

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
21Y2FM	Aviation Company Financial Management	KZ	2	2P+0C+8B	Z	PV
21Y2LS	Air Traffic Services	KZ	2	2P+0C+8B	L	PV
21Y2MQ	Quality Management <i>Vladimír Socha, Luboš Socha</i>	KZ	2	2P+0C+8B	L	PV
21Y2MK	Marketing of Air Transport <i>Peter Vittek</i>	KZ	2	2P+0C+8B	Z	PV
21Y2MC	CNS Systems Modelling <i>Stanislav Pleninger</i>	KZ	2	2P+0C+8B	Z	PV
21Y2PP	Law and Operation in Air Transport	KZ	2	2P+0C+8B	L	PV
21Y2UL	Aircraft Maintenance <i>Ondřej Vítovec, Tomáš Parýzek</i>	KZ	2	2P+0C+8B	L	PV
14Y2UI	Artificial Intelligence	KZ	2	2P+0C+8B	Z,L	PV
21Y2VA	Selected Chapters of Aerodynamics	KZ	2	2P+0C+8B	L	PV

Characteristics of the courses of this group of Study Plan: Code=Y2-NKPL 22/23 Name=PVP nav.kombi program PL 22/23

21Y2FM	Aviation Company Financial Management	KZ	2
Theories of corporate finance - financial statements, budget, forecast. Financial policy of the company. Financial resources - long-term financial resources, depreciation, retained earnings, shares, bonds, loans, leasing, capital. Financial and economic analysis of the company - structure and content.			
21Y2LS	Air Traffic Services	KZ	2
Airspace structure in Czech Republic and other countries. Introduction and description of ATS units in Czech Republic. Practical examples of TWR, APP a ACC control. History of ATS at USA and Czechoslovakia. ATS - Model of financing. Training Systém of Air Traffic Controllers. Future development of ATS.			
21Y2MQ	Quality Management	KZ	2
History, basic definition. Pioneers in the field of quality. International quality organisations and quality promotion in the Czech Republic. Quality management system. Environmental management systems. Integrated management systems. Risk management in the context of the requirements of ISO standards. Sectoral quality management systems. Comprehensive quality management, excellence models and corporate social responsibility. Quality audits.			
21Y2MK	Marketing of Air Transport	KZ	2
The content of the course "Marketing in air transport" is the management of activities and processes using available marketing tools and processes for analysis, strategy development and implementation of sales of goods and services in the aviation industry. In addition to the theoretical foundations of marketing, the lectures present systems of market, competition and product analysis, creation of marketing strategies and planning.			
21Y2MC	CNS Systems Modelling	KZ	2
The course is designed as a set of model tasks in the field of communication navigation and surveillance systems in aviation, addressed using mathematical approaches and software tools. A large part is devoted to air targets tracking, measurement-to-track association, track filtering and multisensor tracking.			
21Y2PP	Law and Operation in Air Transport	KZ	2
Development of aviation law. International conventions on civil aviation. International organisations and including of the Czech Republic in these organisations. EU legislation and civil aviation. Execution of state administration and state supervision in matters of civil aviation, in accordance with Act No. 49/1997 Col. Facilitation. Responsibilities of air carriers for passengers, luggage and cargo. The safe transport of dangerous goods.			
21Y2UL	Aircraft Maintenance	KZ	2
Approved Maintenance Organisations (AMOs), Continuing Airworthiness Management Organisations (CAMOs), Maintenance Training Organisations (MTOs), technical documentation and additional ICA (Instructions for Continued Airworthiness) instructions, aircraft release to service procedure, maintenance programmes and scheduling, modifications and general repair methods, aircraft centre of gravity and weights, human factors in aircraft maintenance.			
14Y2UI	Artificial Intelligence	KZ	2
History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning.			
21Y2VA	Selected Chapters of Aerodynamics	KZ	2
Physical properties of real gases, atmosphere, aeronautical applications of external and internal aerodynamics, compressible internal flow, inlet nozzles and drive nozzles, compressible external flow, supercritical wings and profiles, vertical and oblique shock wave, energy losses, aeronautical aerodynamic profiles of wings, propellers, blades gratings, lift, drag, polar, viscosity, laminar and turbulent flow, boundary layer.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
11APAS	Applied Statistics	Z,ZK	4
Descriptive statistics, data preprocessing, discretize continuous data. Hypothesis testing - continuous and discrete variables. Regression and correlation analysis. Multivariable methods - multiple regression analysis, logistic regression analysis, ROC curve, MANOVA, PCA, Factor analysis. Power analysis, preparation, processing and evaluation of the experiment.			
11MMJ	Mathematical Models and their Applications	Z,ZK	4
System. Regression, discrete and logistic models. Bayesian estimation of model parameters. Parameter estimation of normal regression, discrete and logistic models. Classification with logistic model. One-step and multi-step prediction with regression and discrete models. State model. State estimation. Kalman filter. Control with regression and discrete models.			
11MMOA	Mathematical methods for data analysis	Z,ZK	4
Stochastic modelling, estimation, prediction, filtration, control, methods of data analysis - k-means, DBSCAN, naive Bayes, decision trees, support vector machine.			
11XN1	Master Project 1	Z	2
11XN2	Master Project 2	Z	2
11XN3L	Master Project 3	Z	2
11XN4L	Master Project 4	Z	2
12XN1	Master Project 1	Z	2
12XN2	Master Project 2	Z	2
12XN3L	Master Project 3	Z	2
12XN4L	Master Project 4	Z	2
14XN1	Master Project 1	Z	2
14XN2	Master Project 2	Z	2
14XN3L	Master Project 3	Z	2
14XN4L	Master Project 4	Z	2
14Y2UI	Artificial Intelligence	KZ	2
History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning.			
15J2A1	Language - English 1	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			
15JBA2	Language - English 2	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			
15JBA3	Language - English 3	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement. Optional courses for certificates FCE, CAE.			

15XN1	Master Project 1	Z	2
15XN2	Master Project 2	Z	2
15XN3L	Master Project 3	Z	2
15XN4L	Master Project 4	Z	2
16XN1	Master Project 1	Z	2
16XN2	Master Project 2	Z	2
16XN3L	Master Project 3	Z	2
16XN4L	Master Project 4	Z	2
17XN1	Master Project 1	Z	2
17XN2	Master Project 2	Z	2
17XN3L	Master Project 3	Z	2
17XN4L	Master Project 4	Z	2
18XN1	Master Project 1	Z	2
18XN2	Master Project 2	Z	2
18XN3L	Master Project 3	Z	2
18XN4L	Master Project 4	Z	2
20XN1	Master Project 1	Z	2
20XN2	Master Project 2	Z	2
20XN3L	Master Project 3	Z	2
20XN4L	Master Project 4	Z	2
21AFM	Air Traffic Management	Z,ZK	5
Current ATM system and its functional blocks. View of ATM data (technical architecture and configuration, transmission systems and networks). Data exchange with neighboring ATM systems. Monitoring systems and technical supervision. ATM simulation. ATM conceptions and strategies for next years. EUROCONTROL - CFMU. FAB. ATS's - AOC's data applications.			
21BILD	Safety Engineering in Aviation	Z,ZK	4
The course is focused on understanding the issue of safety, learning how to assess new systems in terms of safety and acquiring principles of safety management. Students will learn explaining accidents and incident causes and bridge their theoretical knowledge with practical problems of air transport.			
21CNSS	CNS Systems	Z,ZK	5
Course provides full technical informations about CNS (communication, navigation, surveillance) systems used in aviation. Systems are presented in perspective of future development.			
21LETS	Airport	Z,ZK	4
Methods of designing new airports and developing existing ones. Connection of the airport to the surrounding infrastructure. Airport economics. Detailed look at the development of movement areas. Certification of airside movement areas and procedures according to EASA CS-ADR-DSN. Development planning - design, preparation and regulatory basis. Environmental aspects of airport operations.			
21LIA1	Aviation Engineering English 1	Z	3
Lectures include various types of the language exercises and are focused on the following topics - EUR-Lex and European Legislation, ICAO Annexes and SARPs, AMCs and GMs, Civil Aviation Authorities, Accident investigation, Aircraft Airworthiness, Aircraft documentations and manuals, Medical certification, Emergency response plan.			
21MULD	Managerial Challenges in Air Transport	Z,ZK	5
The course contains a list of basic managerial tasks in aviation. The basic managerial tasks are quality assurance and operational safety, marketing operations, marketing context implementation, airline network management, fleet management and revenue management. The core disciplines also include project management, cost management and project resource planning and management.			
21NSR	Navigation and Flight Control Systems	Z,ZK	5
Navigation. Radionavigation. Satellite navigation. Flight management system. Autopilot. FMC. Practical execution of flight.			
21PAM1	Programming and Modelling 1	KZ	5
Harmonic signals, their generation. Real signals, sampling theorem, aliasing. Signal filtering. Fourier transform (FT), discrete Fourier transform (DFT), fast Fourier transform (FFT). Spectrum estimation, spectral power density. Image - basic processing methods, 2D Fourier transform, noise filtering, edge detection, linear and non-linear methods, brightness transforms, geometric transforms, image compression.			
21PAM2	Programming and Modelling 2	KZ	5
Descriptive statistics, classical statistical analysis. Statistical hypothesis testing. Analysis of variance (ANOVA), one-factor, two-factor ANOVA. Non-parametric methods. Linear regression. Correlation, correlation coefficient. Non-linear regression models, procedure for regression analysis of a non-linear model. Basics of machine learning. Classification by nearest neighbour method. SVM classifiers. Decision trees.			
21PEKL	Principles and Models in Air Transport Economics	Z,ZK	5
The course contains the most important and typical models on which the economics of air transport is based. It covers the principles of regulation, airline infrastructure models, market structure, analyses airline costs, and looks in detail at the low-cost and charter airline model. It also focuses on airline alliances, air cargo, airline strategies and the economic principles of safety and security.			
21PLDC	Air Carrier Operations	Z,ZK	5
Mission and importance of air transport. Legislation. Airlines - structure, strategy. Performances in air transport. Cost structure. Fuel management. Cargo. Aircraft maintenance (organization) and economics of aircraft operation. Ground handling and other services. Safety / Security / Quality and Compliance monitoring. Revenue management. Air transport and environment.			
21PLET	Airport Operations	Z,ZK	5
Planning, design and modelling of airport processes in airside, landside and terminal buildings. Impact of infrastructure and equipment on airport capacity. Available tools and practices for increasing capacity. Operational analytics, capacity and traffic load forecasting. Purpose and development of an airport masterplan.			
21SPOL	Aircraft Technology Reliability	Z,ZK	4
Subject deals with tuition of separate attributes of reliability (no failure, vitality, maintainability, and so on) and main criterions of safety of production and working of aerospace engineering. General legalities are in the framework of tuition demonstrated on the example of calculation of reliability of integral characteristics of materials and they are practical illustration of its security in The Czech Police Aviation Department.			
21XN1	Master Project 1	Z	2
21XN2	Master Project 2	Z	2
21XN3L	Master Project 3	Z	2
21XN4L	Master Project 4	Z	2

21XNL1	Thesis seminar 1	Z	2
Introduction, scientific publications, publications devoted to scientific writing, grey literature, difference between bachelor and master thesis. Time management. Formal and graphic design, mathematical typesetting, typography, paragraphing, transitions between paragraphs. LaTeX. Research, databases, critical work with text, digital notes, working with notes, outline. Rhetorical exercises / presentation skills.			
21Y2FM	Aviation Company Financial Management	KZ	2
Theories of corporate finance - financial statements, budget, forecast. Financial policy of the company. Financial resources - long-term financial resources, depreciation, retained earnings, shares, bonds, loans, leasing, capital. Financial and economic analysis of the company - structure and content.			
21Y2LS	Air Traffic Services	KZ	2
Airspace structure in Czech Republic and other countries. Introduction and description of ATS units in Czech Republic. Practical examples of TWR, APP a ACC control. History of ATS at USA and Czechoslovakia. ATS - Model of financing. Training System of Air Traffic Controllers. Future development of ATS.			
21Y2MC	CNS Systems Modelling	KZ	2
The course is designed as a set of model tasks in the field of communication navigation and surveillance systems in aviation, addressed using mathematical approaches and software tools. A large part is devoted to air targets tracking, measurement-to-track association, track filtering and multisensor tracking.			
21Y2MK	Marketing of Air Transport	KZ	2
The content of the course "Marketing in air transport" is the management of activities and processes using available marketing tools and processes for analysis, strategy development and implementation of sales of goods and services in the aviation industry. In addition to the theoretical foundations of marketing, the lectures present systems of market, competition and product analysis, creation of marketing strategies and planning.			
21Y2MQ	Quality Management	KZ	2
History, basic definition. Pioneers in the field of quality. International quality organisations and quality promotion in the Czech Republic. Quality management system. Environmental management systems. Integrated management systems. Risk management in the context of the requirements of ISO standards. Sectoral quality management systems. Comprehensive quality management, excellence models and corporate social responsibility. Quality audits.			
21Y2PP	Law and Operation in Air Transport	KZ	2
Development of aviation law. International conventions on civil aviation. International organisations and including of the Czech Republic in these organisations. EU legislation and civil aviation. Execution of state administration and state supervision in matters of civil aviation, in accordance with Act No. 49/1997 Col. Facilitation. Responsibilities of air carriers for passengers, luggage and cargo. The safe transport of dangerous goods.			
21Y2UL	Aircraft Maintenance	KZ	2
Approved Maintenance Organisations (AMOs), Continuing Airworthiness Management Organisations (CAMOs), Maintenance Training Organisations (MTOs), technical documentation and additional ICA (Instructions for Continued Airworthiness) instructions, aircraft release to service procedure, maintenance programmes and scheduling, modifications and general repair methods, aircraft centre of gravity and weights, human factors in aircraft maintenance.			
21Y2VA	Selected Chapters of Aerodynamics	KZ	2
Physical properties of real gases, atmosphere, aeronautical applications of external and internal aerodynamics, compressible internal flow, inlet nozzles and drive nozzles, compressible external flow, supercritical wings and profiles, vertical and oblique shock wave, energy losses, aeronautical aerodynamic profiles of wings, propellers, blades gratings, lift, drag, polar, viscosity, laminar and turbulent flow, boundary layer.			
22XN1	Master Project 1	Z	2
22XN2	Master Project 2	Z	2
22XN3L	Master Project 3	Z	2
22XN4L	Master Project 4	Z	2
23XN1	Master Project 1	Z	2
23XN2	Master Project 2	Z	2
23XN3L	Master Project 3	Z	2
23XN4L	Master Project 4	Z	2

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

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