DESCRIPTION OF THE COURSE

Name of the course: **Research methods in engineering**	Code: **MpAE01**	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Pepo Yordanov, PhD, (FME) tel.: 032 659 514, e-mail: piyordanov@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to provide students with theoretical knowledge and practical skills about numerical methods used in aeronautical engineering.

DESCRIPTION OF THE COURSE: The main topics concern: Errors in computations, Approximation of functions; Linear and nonlinear equations; Numerical integration of functions and ordinary differential equations; Direct measurement errors, Statistical theory with engineering applications; Statistical analysis of stochastic systems; Least square method, Regression analysis; Correlation analysis.

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree.

TEACHING METHODS: Lectures, using slides; laboratory works by solving problems on computers, consultations.

METHOD OF ASSESSMENT: Continuous assessment (80%), laboratory works (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Егер. Проектирование самолетов. Москва, Машиностроение, 1986; 2. Raymer Daniel P. Aircraft Design: A conceptual Approach. Third Editon. AIAA Educational Series, Reston, Virginia ISBN 1-56347-281-0; 3. Raymer Daniel P. RDS-Student: Software for Aircraft Design, Sizing and Performance Aircraft Design: A conceptual Approach. Third Editon. AIAA, Reston, Virginia ISBN 1-56347-047-0.

DESCRIPTION OF THE COURSE

Name of the course: **Aeromechanics**	Code: **MpAE02**	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: 5
Course project (CP)		Number of credits:

LECTURER(S):
Assoc. Prof. Eng. Hristian Panayotov, PhD (Faculty of Mechanical Engineering),
tel.:032.659.518, e-mail: hristian@tu-plovdiv.bg
Assist. Prof. Stanimir Ivanov Penchev, PhD, (Faculty of Mechanical Engineering),
tel.:032.659., e-mail: spenchev@tu-plovdiv.bg

Plovdiv Branch of
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course for the master students specialty "Aeronautical Engineering", Faculty of Mechanical Engineering.

AIMS AND OBJECTIVES OF THE COURSE: At the end of the course the students are expected to be able to work with CFD programs and use them to solve of engineering problems, analyses and validation of the results.

DESCRIPTION OF THE COURSE: The main topics concern: Introduction to computational fluid dynamics. Conversation laws of fluid motion and boundary condition. Finite volume method. Solution of discretised equations. Meshes. Wind tunnels. Principle of balance of wind tunnels. Influence of aeroelasticity phenomena over aircraft stability and controllability characteristics.

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree on Aeronautical engineering.

TEACHING METHODS: Lectures, using projector; laboratory works, consultations
METHOD OF ASSESSMENT: Written exam (80%), laboratory works (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Аржаников Н.С., Садекова Г. С. Аэродинамика летательных аппаратов, Москва, Высшая школа, 1983.; 2. Лойцянский Л. Г., Механика жидкости и газа, Москва, Наука, 1987.; 4. Katz J., Plotkin A. Low – speed aerodynamics, McGraw-Hill, 1991. 5. Ferziger J.H., Peric M., Computational methods for fluid dynamics, Springer, 1996

DESCRIPTION OF THE COURSE

Name of the course: **System engineering in aviation**	Code: **MpAE03**	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: 5
Course project (CP)		Number of credits:

LECTURER(S):
Assoc. Prof. Eng. Hristian Panayotov, PhD (Faculty of Mechanical Engineering),
tel.:032.659.518, e-mail: hristian@tu-plovdiv.bg
Plovdiv Branch of
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course for the master students specialty "Aeronautical Engineering", Faculty of Mechanical Engineering.

AIMS AND OBJECTIVES OF THE COURSE: The course is aims to create based knowledge about modern methods, used in design and management of the life cycle of the complex aviation systems.

DESCRIPTION OF THE COURSE: Main definitions. Synthesis of complex systems, Optimization theory, Selection of effectiveness criteria (FOM), Optimization methods, Simulation modeling, Parametric research, Management of the risk, Research validation, Life cycle.

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree on Aeronautical engineering.

TEACHING METHODS: Lectures, using projector; laboratory works, consultations
METHOD OF ASSESSMENT: Written exam (100%)

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:

1. MSFC Technical Standard EE11 Project Management and Systems Engineering Handbook, MSFC-HDBK-3173, Revision B, October 16, 2012
2. NASA Systems Engineering Handbook, NASA/SP-2007-6105 Rev1, 2007.
3. National Airspace System System Engineering Manual, Version 3.1 06/06/06, Federal Aviation Administration, 2006.
4. http://ocw.mit.edu/courses/aeronautics-and-astronautics/16-885j-aircraft-systems-engineering-fall-2004/
5. INCOSE Systems Engineering Handbook v. 3.1, INCOSE-TP-2003-002-03.1, International Council on Systems Engineering, 2007.

DESCRIPTION OF THE COURSE

Name of the course: **Aircraft Power Plants**	Code: MpAE04.1	Semester: **1**
Type of teaching: Lectures (L) Tutorials (T) Laboratory work (LW) Course work (CW)	Hours per semester: L – 45 hours T – 0 hours LW – 15 hours yes	Number of credits: 5
Course project (CP)	no	Number of credits:

LECTURER(S):
Assoc. Prof. Atanas Dimitrov Nachev, PhD, (Faculty of Mechanical Engineering, 659 514, e-mail: anachev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The course is supposed to train students

to analyze engine failures and identify state of aircraft gas-turbine engines by use of

mathematical models.

DESCRIPTION OF THE COURSE: Within the subject are dealt: Typical failures in gasair flow duct; Small disturbance method for gas flow variation and setting section appraisal. Prominence is given to gas-turbine engine tests. Problems of deleterious noise emission are dealt. Provided practice trains students in detection and analysis of engine failures. Subject gets students ready skilfully to operate and maintain aircraft engines..

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree..

TEACHING METHODS: Lectures, using projector; laboratory works, making protocols; consultations; course project calculation and presentation.

METHOD OF ASSESSMENT: Written exam (100%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Андонова М. М. и кол., Авиационни двигатели. Конструкция, якост и моделиране на ГТД, Актив комерс, София, 2002; 2. Вьюнов, С. А. и др., Конструкция и проектирование авиационных газотурбинных двигателей, Машиностроение, Москва, 1989; 3. Костов, В. и др., Газотурбинни и комбинирани двигатели, ДИ "Техника", 1990; 4. Костов, В., Газотурбинни двигатели и турбокомпресори, ТУ-София, 1998; 5. Костов, В. и З. Дойчинов, Ръководство за курсово проектиране на газотурбинни двигатели, ДИ "Техника", 1977; 6. Савов, Х., Газотурбинни двигатели, ДИ "Техника", 1981; 7. Николов, В и Д. Малинов, Ръководство за курсово проектиране на АГТД, част I: Газодинамично изчисляване на турбореактивни двигатели с интерактивна програмна система, ТУСофия, филиал Пловдив.

DESCRIPTION OF THE COURSE

Name of the course: **Aircraft Structural Mechanics**	Code: **MpAE04.2**	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW) Course work (CW))	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: **5**

LECTURER(S):
Assist. Prof. Eng. Stanimir Penchev, PhD (FME), tel.: 659 632, e-mail: spenchev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of the subject is to introduce students to advanced topics of structural mechanics with applications in aircrafts.

DESCRIPTION OF THE COURSE: The main topics concern: Thin walled beams; Variational methods; Plates and shells; Stress and displacements in aircraft structures; Plastic deformations; Composite materials.

PREREQUISITES: Mechanics, Strength of materials, Aircraft Aerodynamics, Flight Dynamics, Aircraft Structures.

TEACHING METHODS: Lectures, using slides, laboratory work, protocols and course work description preparation and defence

METHOD OF ASSESSMENT: Written exam (70%), laboratories (10%), course work (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Уманский, А. А., Строительная механика самолета, Оборонгиз, Москва, 1961.; 2. Феофанов, А. Ф., Строительная механика авиационных конструкций, Машиностроение, Москва, 1964; 3. Peery, D. J., J. J. Azar, Aircraft Structures, New York, McGraw-Hill, 1982.; 4. Sun, C. T., Mechanics of Aircraft Structures, New York, Wiley Interscience Publications, 1998.; 5. Hoskin, B. C., A. A. Baker, Composite Materials for Aircraft Structures, New York, AIAA, 1986.; 6. Kaw, A. K., Mechanics of Composite Materials, New York, CRC Press, 1997.

DESCRIPTION OF THE COURSE

Name of the course: **AIRCRAFT COMPUTER SYSTEMS**	Code: **MpAE05.1**	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: 5

LECTURER(S):

Assist. Prof. Stoyan Georgiev Avramov, PhD,
Faculty of Mechanical Engineering, tel.: 659 710 , e-mail: stav@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of the subject is the students made a profound study of the aircraft computer systems.

DESCRIPTION OF THE COURSE: The subject broadens students′ knowledge in the field of aircraft computer units and aircraft computer systems- their structure, operation, components and units. Attainable accuracy is analyzed. Operative features and software requirements are bared. Typical applications of aircraft computer systems are examined.

PREREQUISITES: Knowledge, acquired in bachelor′s degree.

TEACHING METHODS: Lectures, laboratory works.

METHOD OF ASSESSMENT: Written exam.

INSTRUCTION LANGUAGE: Bulgarian language

BIBLIOGRAPHY:

1. Mike Tooley, “Aircraft Digital Electronic and Computer Systems” 2nd Edition, ISBN: 978-0415828604, ROUTLEDGE 2013

2. Ian Moir, Allan Seabridge, Malcolm Jukes, “Civil Avionics Systems” 2nd Edition, ISBN: 978-1-118-34180-3, WILEY 2013

3. Michael H Tooley, David Wyatt, “Aircraft Communications and Navigation Systems” 2nd Edition, ISBN : 978-0415827751, ELSEVIER 2017

4. David Wyatt, Mike Tooley, “Aircraft Electrical and Electronic Systems” 2nd Edition, ISBN: 978-0415827768, ROUTLEDGE 2018

5. Manuel Soler, “Fundamentals of aerospace engineering”, ISBN: 978-1493727759, CREATESPACE 2014

6. Larry Reithmaier, Ron Sterkenburg, “Standard Aircraft Handbook for Mechanics and Technicians” Seventh Edition, ISBN: 978-0071826792, Mcgraw-Hill Education 2013.

DESCRIPTION OF THE COURSE

Name of the course: **Aircraft Design**	Code: **MpAE05.2**	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: 5
Course project (CP)		Number of credits:

LECTURER(S):
Assoc. Prof. Eng. Hristian Panayotov, PhD (Faculty of Mechanical Engineering),
tel.:032.659.518, e-mail: hristian@tu-plovdiv.bg

Plovdiv Branch of
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course for the master students specialty "Aeronautical Engineering", Faculty of Mechanical Engineering.

AIMS AND OBJECTIVES OF THE COURSE: The subject purpose is to introduce the methodology of the aircraft design, its main systems and subsystems. At the end of the course, the students must be able to apply the methodology of the aircraft design and to perform the conceptual design.

DESCRIPTION OF THE COURSE: The main topics concern: Methodology of complex systems design, Conceptual design, Aircraft subsystem design, Optimization,

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree on Aeronautical engineering.

TEACHING METHODS: Lectures, using projector; laboratory works, consultations
METHOD OF ASSESSMENT: Written exam (80%), laboratory works (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. **Advanced Aircraft Design: Conceptual Design, Analysis and Optimization of Subsonic Civil Airplanes,** Egbert Torenbeek
Print ISBN:9781118568118 |Online ISBN:9781118568101 |DOI:10.1002/9781118568101
© 2013 Egbert Torenbeek All rights reserved 2013 John Wiley and Sons, Ltd.;

2. Raymer Daniel P. Aircraft Design: A conceptual Approach. Third Editon. AIAA Educational Series, Reston, Virginia ISBN 1-56347-281-0;
3. Raymer Daniel P. RDS-Student: Software for Aircraft Design, Sizing and Performance Aircraft Design: A conceptual Approach. Third Editon. AIAA, Reston, Virginia ISBN 1-56347-047-0

DESCRIPTION OF THE COURSE

Name of the course: **Management in civil aviation**	Code: MpAE06.1	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 30 hoursno	Number of credits: 4
Course project (CP)	By choice	Number of credits: 2

LECTURER(S):
Assoc. Prof. Atanas Nachev, PhD, (Faculty of Mechanical Engineering, 032 - 659 514, e-mail: anachev@tu-plovdiv.bg
Assist. Prof. Dancho Kolibarov, PhD, (Faculty of Mechanical Engineering), тел.: 032-659 593, e-mail: danchokol@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The subject purpose is to introduce students in aircraft operation- flight planning, flight arrangement, preparatory procedures, flight performance, flight management procedures, flight requirements in accordance with international aviation standards.

DESCRIPTION OF THE COURSE: The main topics concern: aircraft operation- flight planning, flight arrangement, preparatory procedures, flight performance, flight management procedures, flight requirements and international aviation standards.

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree.

TEACHING METHODS: Lectures, using slides, laboratory work and project description and defense.

METHOD OF ASSESSMENT: A written examination at the end of the semester (80%), laboratory works (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Чикагска конвенция за международно гражданско въздухоплаване (Указ 569 от 04.08.1966г., обн. ДВ, бр 55/08.07.1994г); 2. Международна конвенция на Евроконтрол за сътрудничество за безопасност на въздухоплаването в Европа (обн. ДВ., бр. 77 от 31.08.1999г.); 3. Закон за гражданското въздухоплаване в Република България (ДВ бр.34 от 03.04.2001г.); 4. Наредба N 2 от 10.03.1999 за правила за полети (обн. ДВ бр.26/23.03.1999г.); 5. Наредба N 3 от 31.05.1996 за аварийно-спасително осигуряване на полетите в гражданските летища (обн. ДВ бр.57/05.07.1996г.); 6. Наредба N 7 от 14.01.1999г. за регистрация на гражданските въздухоплавателни средства в Република България (обн. ДВ бр.9/02.02.1999г.); 7. Наредба N 8 от 12.05.1999г. за определяне на летателната годност на гражданските въздухоплавателни средства в Република България (обн. ДВ бр.55/18.06.1999г.).

DESCRIPTION OF THE COURSE

Name of the course: **Human factor**	Code: MpAE06.2	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 30 hours	Number of credits: 4
Course project (CP)	By choice	Number of credits: 2

LECTURER(S):
Assoc. Prof. Atanas Nachev, PhD, (Faculty of Mechanical Engineering, 032 - 659 514, e-mail: anachev@tu-plovdiv.bg
Assist. Prof. Dancho Kolibarov, PhD, (Faculty of Mechanical Engineering), тел.: 032-659 593, e-mail: danchokol@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course from elective block A for the master students specialty "Aeronautical Engineering", Faculty of Mechanical Engineering...

AIMS AND OBJECTIVES OF THE COURSE: The subject purpose is to introduce students in role of human factor in aircraft operation- flight planning, flight arrangement, preparatory procedures, flight performance, flight management procedures, flight requirements in accordance with international aviation standards.

DESCRIPTION OF THE COURSE: The main topics concern: Operational procedures; Human performance and Limitations; Requirements for the qualification of flight crew; Assessments of the Flight Safety due to wrong actions of the flight crew; System for control and monitoring of flight operation and implementation of organizational courses to increase the level of Flight Safety.

PREREQUISITES: Aerodynamics, Priciples of flight, Flight Planning, Aviation Law.

TEACHING METHODS: Lectures, using slides, laboratory work and project description and defense..

METHOD OF ASSESSMENT: A written examination at the end of the semester (100%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1.Международна конвенция на Евроконтрол за сътрудничество за безопасност на въздухоплаването в Европа (обн. ДВ., бр. 77 от 31.08.1999г.); 2. Закон за гражданското въздухоплаване в Република България (ДВ бр.34 от 03.04.2001г.); 3. Наредба N 3 от 31.05.1996 за аварийно – спасително осигуряване на полетите в гражданските летища (обн. ДВ бр.57/05.07.1996г.); 4.Аникин, Назаров. Техническая эксплуатация самолетов, - М.: Транспорт, 1984, 5. Волков Л. И. Управление эксплуатацией летательных комплексов, - М.: Высшая щкола, 1981, 6. Техническая эксплуатация летательных аппаратов. Под ред. Н. Н. Смирнова, М.: Транспорт, 1990, 7.Маджаров Б.И. Безопасност на полетите Мадара-Принт,1999., 8.Жулев В.И. Безопастност полетов летательных аппаратов. М. Транспорт 1986.

DESCRIPTION OF THE COURSE

Name of the course: Aircraft reliability	Code: MpAE08	Semester: 2
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: 4

LECTURER(S):
Assoc. Prof. Atanas Dimitrov Nachev, PhD, (Faculty of Mechanical Engineering, 659 514, e-mail: anachev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The course is supposed to train students how to solve problems connected with aircraft reliability, control and their fault diagnostics.

DESCRIPTION OF THE COURSE: In the course of lectures and laboratory work, students get known with reliability quantitative characteristics and their calculation by the use of operative statistic information. Here are shown main aspects from reliability supplying plan in the course of aircraft design, manufacture, operation. Problems dealing with analysis and identifying of aircraft ingredient state are exposed in “Diagnostics” part. Special attention is paid to non-destructive test methods and vibration diagnostics.

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree.

TEACHING METHODS: Lectures, using projector; laboratory works, making protocols;

course work description preparation and defence; consultations.

METHOD OF ASSESSMENT: Written exam (70%), laboratory works (10%), course work (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1. Андонова М., Надеждност и диагностика на авиационната техника - сборник лекции. С., ТУ-София, 2008.; 2. Барзелович Е. Ю., Надежность авиационых систем. М., Транспорт, 1982; 3. Воробьев В. Г., Константинов В. Д., Надежность и эфективность авиационого оборудвания. М., Транспорт, 1995; 4. Гиндев Ев., Надеждност на авиационната техника. С., ТУ- София, 1998; 5. Пархоменко П. П., Основы технической диагностики. М., Энергия, 1976; 6. Скордев А. Д., Безразрушителен контрол. С., Техника, 1984; 7. Фирстов В., Автоматизированые приборы диагностики и испитаний. М., Машиностроение, 1995; 8. Bedford T., Cooke R., Probabilistic Risk Analysis: Foundations and Methods. Cambridge University Press, 2001; 9. Ebeling Ch. E., Introduction to Reliability and Maintainability Engineering. Waveland Pr Inc, 2005; 10. Kroes M. J., Watkins W. A., Aircraft Powerplants, 7-th ed. Glencoe, McGraw-Hill, USA, 1995..

DESCRIPTION OF THE COURSE

Name of the course: **Airports**	Code: MpAE09	Semester: **1**
Type of teaching: Lectures (L) Laboratory work (LW))	Hours per semester: L – 30 hours LW – 15 hours	Number of credits: 3

LECTURER(S):
Assoc. Prof. Hristian Panayotov, PhD, (Faculty of Mechanical Engineering, 032 - 659 518, e-mail: hristian@tu-plovdiv.bg
Assist. Prof. Dancho Kolibarov, PhD, (Faculty of Mechanical Engineering), тел.: 032-659 593,
e-mail: danchokol@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to provide students with theoretical knowledge about the system of the civil aviation.

DESCRIPTION OF THE COURSE: Students are taught how to solve problems of ground flight supplying details. Airport machinery and equipment use are regarded. It is supposed knowledge and skills in operation prognosis, working efficiency of airport and its automated control systems to be gained.

PREREQUISITES: The subject is based on the knowledge, acquired in bachelor′s degree.

TEACHING METHODS: This educational course is carried out by series of lectures, practice, and an examination.

METHOD OF ASSESSMENT: Written exam (70%), laboratory works (10%), course work (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:
1.Руководство по проектированию аэропортов. Част 1. Генеральное планирование. Doc.9184AN/902, Part 1, ICAO.; 2.Ашфорд Н., Райт П.Х. Проектирование аэропортов, Москва, Транспорт, 1988.; 3.Летища. ИКАО. Приложение N 14 към конвенцията за международната гражданска авиация.; 4.Airport Design. AC N 150/5300-13, FAA, US.; 5.Блохин В. И. И др. Аэропорты и воздушные трассы, Москва, Транспорт, 1984.; 6.Ръководство за летищните служби, ICAO Doc.9137-AN898, Part 1, Part 5, Part 7, Part 9.; 7.Александров В. Г. и др., Справочник авиационного инженера, Москва, Транспорт, 1974.

DESCRIPTION OF THE COURSE

Name of the course: Aviation technologies	Code: MpAE10	Semester: 2
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: 4

LECTURER(S):
Assoc. Prof. Atanas Dimitrov Nachev, PhD, (Faculty of Mechanical Engineering, 659 514, e-mail: anachev@tu-plovdiv.bg
Assist. Prof. Dancho Stoianov Kolibarov, PhD, (Faculty of Mechanical Engineering), tel.: 032 659 593 e-mail: danchokol@abv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5. Transport, navigation and aviation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of the subject is to teach students about aircraft′s flight validity support.

DESCRIPTION OF THE COURSE: General requirements′ information of maintenance services hierarchy is given in lecture course and laboratory practice. Elaboration and optimization methods of maintenance plans are shown. Maintenance control and staff training are described. Essential part of the course is calculation skills for aircraft devices processing to be acquired. Special features of helicopter maintenance are revealed.

PREREQUISITES: The main topics concern: Aircraft; Systems, powerplant and electrics, Operational Procedures, Aviation technology.

TEACHING METHODS: lectures, laboratory workThe main topics concern: Modelling of structures by finite elements; Truss and beam structures; Plane, plate and shell elements; Dynamic problems; Nonlinear problems; Aeroelastic problems; Optimal design.

METHOD OF ASSESSMENT: Continuous assessment at the end of the semester.

INSTRUCTION LANGUAGE: Bulgarian language.

BIBLIOGRAPHY: 1. Смирнов И. И., Ицкович А. А., Обслуживание и ремонт авиационной техники по состоянию. – М.: Транспорт, 1987; 2. Деркач О.Я., Формирование систем технического обслуживания самолетов при их создании. - М.: “Машиностроение”, 1993; 3. Под редакцией Голего Н.Л., Ремонт летательных аппаратов. - М.: Транспорт, Москва, 1977; 4. Колев К. Т., Ремонт на летателните апарати - С.:Военно издателство, 1980; 5. Анцелиович Л. Л. Надежность, безотказность и живучесть самолета – М.: Машинострое- ние, 1985; 6. Под редакцией проф. А.И.Пугачева, Техническая эксплуатация летательных аппаратов, – М.: Транспорт, 1977.

DESCRIPTION OF THE COURSE

Name of the course: **Aircraft Structural Mechanics**	Code: **MpAE11.1**	Semester: **2**
Type of teaching: Lectures (L) Laboratory work (LW) Course work (CW))	Hours per semester: L – 45 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. Eng. Hristian Panayotov, PhD (FME), tel.: 659 518, e-mail: hristian@tu-plovdiv.bg
Assist. Prof. Eng. Stanimir Penchev, PhD (FME), tel.: 659 632, e-mail: spenchev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Master's degree, specialty Aeronautical Engineering, Professional orientation 5.5 Transport, navigation and aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of the subject is to introduce students to advanced techniques for analyze aircraft structures by computers using CAD/CAE-systems.

DESCRIPTION OF THE COURSE: The main topics concern: Modelling of structures by finite elements; Truss and beam structures; Plane, plate and shell elements; Dynamic problems; Nonlinear problems; Aeroelastic problems; Optimal design.

PREREQUISITES: Mechanics, Strength of materials, Aircraft Aerodynamics, Flight

Dynamics, Aircraft Structures.

TEACHING METHODS: Lectures, using slides, laboratory work, protocols and course work description preparation and defence

METHOD OF ASSESSMENT: Written exam (70%), laboratories (10%), course work (20%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Авдонин А. С., Фигуровский В. И. Расчет на прочность летательных аппаратов, Москва, “Машиностроение”, 1985; 2. Кан С. И., Свердлов И. А. Расчет самолета на прочность, Москва, “Машиностроение”, 1972; 3. Новожилов В.В. Линейная теория тонких оболочек. Ленинград, “Политехника”, 1991; 4. Фершинг Г. Основы аэроупругости, Москва, “Машиностроение”, 1984.

DESCRIPTION OF THE COURSE

Name of the course: **On-board automatic control systems**	Code: **MpAE11.2**	Semester: **2**
Type of teaching: Lectures (L) Laboratory work (LW)/Seminars (S) Course work (CW)	Hours per semester: L – 45 hours S – 0 hours LW – 15 hours	Number of credits: **4**

LECTURER(S):
Assoc. Prof. PhD and DSc Borislav Penev, tel.: 032-659-527, e-mail: bpenev@tu-plovdiv.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective subject from the curriculum for training of students to obtain Master's degree, specialty "Aviation Engineering", Professional orientation 5.5 Transport, shipping and aviation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is for students to acquire knowledge about the aircraft as a control object, the principles of construction, complexation and inclusion of automatic control systems in flight control tracts, to know the functioning of typical control loops, their mathematical model, analysis and synthesis from the point of view of their construction as an automatic control system through the methods of automatic control theory and the use of the Matlab program with Simulink.

DESCRIPTION OF THE COURSE: Main topics: Tasks and means of flight control; Complexation of automatic flight control systems; Models of drives in control systems; The aircraft as an object of control; Automatic systems for improving the stability and controllability of the aircraft; Autopilots; Automatic control of the angular movement of the aircraft; Automatic control of the trajectory movement of the aircraft.

PREREQUISITES: The discipline is based primarily on the fundamental mathematical preparation of students and other disciplines studied in the bachelor's degree, such as the discipline Aviation Instruments and Automatic Systems.

TEACHING METHODS: Lectures, classical and using slides, laboratory works with protocols, work in teams, course work.

METHOD OF ASSESSMENT: Written exam (80%), laboratory work (20%).

INSTRUCTION LANGUAGE: in Bulgarian

BIBLIOGRAPHY: 1. Ищев, К. Теория на автоматичното управление, ТУ-София, София, 2007; 2. Åström, K. J. and Murray, R. M. Feedback Systems, Princeton University Press, Princeton, New Jersey 08540, 2009; 3. Пенев, Б. Анализ и синтез на примерни системи за автоматично управление на летателни апарати, ТУ-София, Филиал Пловдив, Пловдив, 2006. ISBN-13: 978-954-8779-84-5; 4. Стоянов, Ц. Бордни системи за автоматично управление на самолетите, ТУ-София, София, 2007. ISBN-13: 978-954-438-605-4