

AIT209 Atatürk's Principles and Revolution History-1 (2-0-2) 2 ECTS

The purpose of studying Atatürk's Principles and Revolution History and the concept of Revolution. The reasons that prepared the collapse of the Ottoman Empire and the Turkish Revolution. The disintegration of the Ottoman Empire, the Tripoli War, the Balkan Wars, the First World War. The Armistice of Mondros. The situation of the country against the occupations and Mustafa Kemal Pasha's reaction, Mustafa Kemal Pasha's arrival in Samsun. The first step for the National Struggle, organization through congresses: Amasya, Erzurum and Sivas Congresses. Kuvayı Milliye and Misak-ı Milli. The opening of the Turkish Grand National Assembly. The Turkish Grand National Assembly taking over the management of the War of Independence. The Treaty of Sevres. Political events until the Sakarya Victory. Military developments until the Sakarya War. The Sakarya War and the Great Offensive. Mudanya Armistice, Lausanne Peace Treaty

Lecture Book: Yahya Akyüz, Ergün Aybars, Utkan Kacatürk; Atatürk İlkeleri ve İnkılap Tarihi, I-II C, YÖK Yayınları, Ankara, 1997.

Auxiliary Lecture Book: Mehmet Alpargu, İsmail Özçelik, Nuri Yavuz; Atatürk İlkerli ve Türk İnkılap Tarihi, Ankara, 2001 Ergün Aybars: Türkiye Cumhuriyeti Tarihi, I, İzmir, 1984.

AIT102 Atatürk's Principles and History of Revolution-II (2-0-2) 2 ECTS

The strategy of the Turkish Revolution, revolutions made in the political field: declaration of the republic, abolition of the caliphate, the Progressive Republican Party and the Takrir-i Sükun Period, revolutions made in the field of law, revolutions made in the field of education and culture, revolutions made in the economic field, the attempt to switch to a multi-party system and some domestic political events, revolutions made in the social and communal fields, Turkish foreign policy in the Atatürk period, Turkish foreign policy between the years 1923-1932, Turkish foreign policy between the years 1932-1938, Atatürk's Principles: Republicanism, Nationalism. Populism, Statism. Secularism, Revolutionism.

Lecture Book: Yahya Akyüz, Ergün Aybars, Utkan Kacatürk; Atatürk İlkeleri ve İnkılap Tarihi, I-II C, YÖK Yayınları, Ankara, 1997.

Auxiliary Lecture Book: Mehmet Alpargu, İsmail Özçelik, Nuri Yavuz; Atatürk İlkerli ve Türk İnkılap Tarihi, Ankara, 2001 Ergün Aybars: Türkiye Cumhuriyeti Tarihi, I, İzmir, 1984.

MAT1151 Mathematics I (4 – 0-4) 6 ECTS

Arithmetic terms and signs; methods of multiplication and division; fractions and decimals; factors and multipliers; weights, measures and conversion factors; ratio and proportion; averages and percentages; areas and volumes, squares, cubes; square and cube roots.

Lecture Book: Prof. Dr. Mustafa BALCI, “Meslek Yüksekokulu ve Teknik Eğitim Fakülteleri için Temel Matematik”, Balcı Yayınları, 2008. Genel Matematik, M. Balcı, A.Ü. Fen Ed. Fak. Yayınları • Calculus, R.A.Adams, Vancouver, Canada , 1994

Auxiliary Lecture Book: Kemal Temizyürek, Nurdan Çolakoğlu, “Meslek Yüksekokulları için Uygulamalı Matematik”, Beta, 2009. • Çözümlü Matematik Analiz problemleri, M. Balcı, Balcı Yayınları

MAT1152 Mathematics II (4 – 0-4) 6 ECTS

Evaluation of simple algebraic expressions, addition, subtraction, multiplication and division; linear equations and their solutions, linear equations in one variable, linear systems of equations in two variables; formulas, functions and graphs; mathematical operations with logarithms, calculations with logarithms, natural logarithms; number systems, exponents, mathematical transformations of number systems; geometry, simple geometric structures; graphs, graphical representation; properties and uses of graphs, equation/function graphs; trigonometry, simple trigonometry; trigonometric relationships; use of tables and orthogonal and polar coordinates;

Lecture Book: Prof. Dr. Mustafa BALCI, “Meslek Yüksekokulu ve Teknik Eğitim Fakülteleri için Temel Matematik”, Balcı Yayınları, 2008. • Genel Matematik, M. Balcı, A.Ü. Fen Ed. Fak.

Auxiliary Lecture Book: Calculus, R.A.Adams, Vancouver,Canada , 1994 • Advanced Calculus, Schaum’s outlines. • Çözümlü Matematik Analiz problemleri, M. Balcı, Balcı Yayınları Ders Notları

TRD109 Turkish Language-1 (2- 0-2) 2 ECTS

What is language? The place and importance of language as a social institution in national life. The place of Turkish language among world languages. The development of Turkish language and its historical periods. The development of Turkish language and its historical periods. Sounds in Turkish and their classification. Sound properties of Turkish and rules related to phonetics. Syllable information. Derivative suffixes of Turkish and their application. General information about composition, plan and application to be used in writing composition. General information about composition, plan and application to be used in writing composition. Writing petition and resume. Spelling and punctuation.

Lecture Book: ERGİN Muharrem, Üniversiteler İçin Türk Dili.

Auxiliary Lecture Books: Korkmaz Z, Akalin M, Ercilasun A, Yükseköğretim Öğrencileri İçin Türk Dili ve Kompozisyon Bilgileri. Yavuz K, Yetiş K, Birinci N, Üniversite Türk Dili ve Kompozisyon Dersleri. Paçacıoğlu B, Türk Dili Dersleri- İmlâ Kılavuzu.

TRD110 Turkish Language -II (2- 0-2) 2 ECTS

Forms of expression in composition. Story, description. Essay, article. Noun conjugations in Turkish. Verb conjugations in Turkish. Words in terms of meaning and function - nouns, adjectives, adverbs. Pronouns, verbs,

prepositions. Elements of the sentence. Sentence analysis and application. Reading and examining works related to the world of literature and thought. Reading and examining works related to the world of literature and thought. Rhetorical applications. Rules to be followed in the preparation of scientific articles. Expert report. Spelling and punctuation.

Lecture Book: ERGİN Muharrem, Üniversiteler İçin Türk Dili.

Auxiliary Lecture Books: Korkmaz Z, Akalin M, Ercilasun A, Yükseköğretim Öğrencileri İçin Türk Dili ve Kompozisyon Bilgileri. Yavuz K, Yetiş K, Birinci N, Üniversite Türk Dili ve Kompozisyon Dersleri. Paçacıoğlu B, Türk Dili Dersleri- İmlâ Kılavuzu.

YDİ107 English-I (2- 0-2) 2 AKTS

Vocabulary: Countries and Nationalities – Grammar: Verb BE – Skills: Introducing yourself and others. Vocabulary: Daily routines – Grammar: Present Simple Statements. Reading: “A Day in My Life” – Writing Task: Write about your Daily routine. Vocabulary: Free Time Activities – Grammar: Present Simple Questions – Skills: Answer a Survey. Vocabulary: Free Time Activities – Grammar: Present Simple Questions – Skills: Answer a Survey. Skills: Introducing your family. Vocabulary: Places in a Town – Grammar: There is/There are. Skills: Describing a Town or a City. Vocabulary: Rooms and Furniture – Grammar: Present Continuous Tense. Skills: Describing a room. Vocabulary: Months of the Year – Grammar: can/can’t. Skills: Writing an invitation. Vocabulary: Jobs – Grammar: Present Continuous vs. Present Simple. Skills: Describing a job.

Lecture Book: Language To Go-Upper Intermediate Student's Book/Workbook, Antonia Clare, JJ Wilson, Simon Greenall (LONGMAN-PEARSON).

YDİ108 English-II (2- 0-2) 2 ECTS

Possession (have, has got). There is, there are, quantitative adjectives. Prepositions (under, near, next ...). Making suggestions (let’s, shall, would ...). Making suggestions (let’s, shall, would ...). Asking for help (can you ...). Adverbs of Frequency (never, always, often ...). Present cont. Tense. General exercises on the previous subjects. General exercises on the previous subjects. Simple past tense. Exercises with regular and irregular verbs on Simple past tense. Past use of verb “to be” with affirmative, negative and interrogative forms. General revision and exercises.

Lecture Book: Language To Go-Upper Intermediate Student's Book/Workbook, Antonia Clare, JJ Wilson, Simon Greenall (LONGMAN-PEARSON).

FİZ1121 Fizik (3 – 0 - 3) 4 ECTS

The nature of matter: Chemical elements, structure of atoms, molecules; Chemical compositions; States of matter: Properties of solid, liquid and gas; Changes between states of matter; Pressure and buoyancy in liquids (Barometers) The nature of light; Speed of light; Laws of reflection and refraction; Reflection on plane surfaces, reflection by spherical mirrors, refraction; Lenses; Fiber optics; Wave motion: Mechanical waves, sinusoidal wave

motion, Obstruction phenomenon, standing waves; Sound, Speed of sound, Sound production; Sound level, intensity, pitch and quality, Doppler effect

Lecture Book: Dalgalar Katılar ve Akışkanlar Termodinamik ve Optik ,Frederick J. Keller | W. Edward Gettys | Malcolm J. Skove Çevirmen R. Ömür Akyüz, Serdar Nergiz, Galip Tepehan, ERHAN GÜLMEZ, Bekir Karaoğlu,

Auxiliary Lecture Book: Fizik1, Frederick J. Keller | W. Edward Gettys | Malcolm J. Skove Çevirmen R. Ömür Akyüz, Serdar Nergiz, Galip Tepehan, ERHAN GÜLMEZ, Bekir Karaoğlu, Literatür, • Fizik 2 ,Frederick J. Keller | W. Edward Gettys | Malcolm J. Skove Çevirmen R. Ömür Akyüz, Serdar Nergiz, Galip Tepehan, ERHAN GÜLMEZ, Bekir Karaoğlu,

UBO1101 Electrical Fundamentals-I (3-0-3) 3 ECTS

Electron Theory; Distribution and structure of electrical charges in atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors and insulators. Static Electricity and Conduction/Transmission; Distribution of static electricity and electrostatic charges; Laws of electrostatic attraction and repulsion; Units of charge, Coulomb's Law; Electrical conduction in solids, liquids, gases and vacuum. Electrical Terminology; Potential difference, electromotive force, voltage, current, resistance, conductance/conductivity, charge, conventional current direction, electron flow, units of the terms in question and factors affecting the units in question. Electricity Production; Electricity production by the following methods: Light, heat, friction, pressure, chemical effect, magnetism and motion. DC Electricity Sources; Construction and basic chemical action of: Primary batteries, secondary batteries, lead acid batteries, nickel cadmium batteries, other alkaline batteries; Batteries connected in series and in parallel; Internal resistance and its effect on a battery; Construction, materials and operation of thermocouples; Operation of photocells. DC circuits; Ohm's law, Kirchoff's voltage and current laws; Calculations using the above laws to find resistance, voltage and current; Importance of internal resistance of a current feeder. Resistance; Resistance and affecting factors; Specific resistance; Resistance colour code, values and tolerances, preferred values, wattages; Series and parallel resistors; Calculation of total resistance using series, parallel and series-parallel combinations; Operation and use of potentiometers and rheostats/variable resistors; Operation of the Wheatstone Bridge; Positive and negative temperature coefficient of conductance; Fixed resistors, stability, tolerances and limitations, methods of construction; Independent/variable resistors, thermistors, voltage controlled resistors; Construction of potentiometers and rheostats/variable resistors; Construction of Wheatstone Bridge; Power/Energy; Power, work and energy (kinetic and potential); Energy loss in resistors; Power/Energy formula; Calculations involving power, work and energy. Capacitance/Capacitor; Operation and functioning of capacitor; Factors affecting flange capacitance area, distance between flanges, number of flanges, dielectric and dielectric constant, working voltage, voltage voltage; Capacitor types, construction and function; Capacitor color coding; Calculations of capacitance and voltage in series and parallel circuits; Exponential charge and discharge of capacitor, time constants; Testing of capacitors.

Lecture Book : Firat University School of Civil Aviation, Electrical Fundamentals I course lecture notes.

Charles Alexander, Matthew N.O. Sadiku, Fundamentals of Electric Circuits, 2012.

Total Training Support (TTS), EASA PART 66, Module 3.

David Irwin, R. Mark Nelms, Basic Engineering Circuit Analysis, Nobel Publishing, 2015.

Auxiliary Lecture Book : Susan A. Riedel, James W. Nilsson, Adnan Köksal (Translator), Electrical Circuits, Palme Publications, 2012.

Hayt W., Kemmerly J., Durbin S., Engineering Circuit Analysis, McGraw-Hill, 2007.

UBO1102 Mechanics (3 – 0 - 3) 4 AKTS

General Principles: Forces, Moments and Couples, Vector Representations; Center of Gravity; Elements of Theory of Stress, Strain and Elasticity; Tension, Compression, Shear and Torsion; Linear Motion: Uniform Motion in a Straight Line, Motion at Constant Acceleration (Motion under Gravity); Rotational Motion: Uniform Circular Motion (Centrifugal Forces); Pendular Motion; Simple Theory of Vibration, Harmonics and Resonance; Rate of Velocity and Mechanical Advantage; Mass, Force, Rest/Inertia; Power, Energy (Potential, Kinetic and Total Energy), Heat, Activity; Momentum, Conservation of Momentum; Gyroscopic Principles; Impulse; Friction: Properties and Effects, Coefficient of Friction (Rolling Resistance); **Lecture**

Book: Fırat Üniversitesi Sivil Havacılık Yüksekokulu, MEKANİK dersi ders notu • Klasik Mekanik, T W Kibble, Palme Yayıncılık, 1999.

Auxiliary Lecture Book: Mühendislikte Mekanik Statik, Sinan Çağdaş, İstanbul Gelişim Üniversitesi, 2014. • Mühendisler için Mekanik Statik ve Mukavemet Çözümlü Problemleri, Prof. Dr. Mehmet H. Omurtag, BETA BASIM YAYIM, 2003.

UBO1103 Electrical Fundamentals Laboratory-I (0-2-1) 2 ECTS

Application 1a Resistance Measurement; Application 1b Potentiometer Characteristics; Application 2a DC Voltage Measurement; Application 2b DC Current Measurement; Application 3 Application of Ohm's Law; Application 4 Series-Parallel Network and Kirchhoff's Law; Application 5 Wheatstone Bridge; Application 6 Superposition, Thevenin and Norton Theorems; Application 7a Power in a DC Circuit; Application 7b Maximum Power Transfer Theorem; Application 8 DC RC Circuit and Transients; Application 9 DC RL Circuit and Transients.

Lecture Book : Fırat University Civil Aviation School, Electrical Fundamentals Laboratory-I course notes.

David Irwin, R. Mark Nelms, Basic Engineering Circuit Analysis, Nobel Publishing, 2015.

Auxiliary Lecture Book : Susan A. Riedel, James W. Nilsson, Electrical Circuits, Palme Publications, 2012.

Hayt W., Kemmerly J., Durbin S., Engineering Circuit Analysis, McGraw-Hill, 2007.

UBO1104 Electrical Fundamentals-II (3-0-3) 3 ECTS

Magnetism; Theory of magnetism; Properties of magnet; Movement of magnet suspended in the Earth's magnetic field; Magnetization and demagnetization; Magnetic shielding; Various types of magnetic materials; Structure and working principles of electromagnets; "Hand" rules determining the magnetic field around a current-carrying conductor; Magneto motor force, field intensity, magnetic flux density, permeability, hysteresis loop, residual magnet flux density, magnetic resistance against the force of demagnetization, saturation point, eddy currents; Precautions for maintenance and storage of magnets. Inductance/Inductor; Faraday's Law; Induction process of voltage in a conductor moving in a magnetic field; Induction principles; Effects depending on the magnitude of the induced voltage: Magnetic field strength, rate of flux change, number of turns in the conductor; Mutual induction; Effect of rate of change of primary current and effect of mutual induction on induced voltage; Factors affecting mutual induction; Number of turns in the winding, physical size of the winding, winding permeability, position of the windings relative to each other; Lenz's Law and rules for determining polarity; Back/reverse emf, self-induction; Saturation point: Main uses of inductors. AC Theory; Sinusoidal waveform, Phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak-to-peak current values and calculation of these values in terms of voltage, current and power; Triangle/Square waves; Single/three phase principles. Resistive (R), Capacitive (C) and Inductive (L) Circuits; Phase relationship of voltage and current in L, C and R circuits, Parallel, series and series-parallel L, C and R circuits, Power loss in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations. Filters; Operation, application and use of low-pass, high-pass, band-pass and band-stop filters; Use of low pass, high pass, band pass and band stop filters.

Lecture Book : Firat University Civil Aviation School, Electrical Fundamentals II course notes.

Charles Alexander, Matthew N.O. Sadiku, Fundamentals of Electric Circuits, 2012.

Total Training Support (TTS), EASA PART 66, Module 3.

Uğur Arifoğlu, Fundamentals of Electrical and Electronic Engineering Alternating Current Circuits Volume-2, Alfa Publications, 2012.

UBO1105 Introduction to Civil Aviation (2 – 0 - 2) 2 ECTS

Historical development of civil aviation, Aircraft and classification, Basic Aviation terms and alphabet, Civil aviation system, General aviation activities, Air transportation, Airline operations and types, Aircraft Maintenance and Maintenance Organizations, Introduction of airports and airport sections, Ground services, Air Traffic Management, Regulation of Civil Aviation activities, International civil aviation organizations: ICAO, Eurocontrol, JAA, EASA, Turkish civil aviation: SHGM and rules,

Ders Kitabı: Ders Kitabı: • Havacılığa Giriş, Anadolu Üniversitesi Yayınları, Mustafa CAVCAR • Genel Havacılık, Anadolu Üniversitesi Yayınları, Özlem ŞAHİN

GÜLMEZ, Bekir Karaoğlu,

Auxiliary Lecture Book : David Irwin, R. Mark Nelms, Basic Engineering Circuit Analysis, Nobel Publishing, 2015.

Engineering Circuit Analysis, Hayt W., Kemmerly J., Durbin S., McGraw-Hill, 2007.

UBO1106 Electrical Fundamentals Laboratory-II (0-2-1) 2 ECTS

Application 1-1 AC Voltage Measurement; Application 1-2 AC Current Measurement; Application 2 AC RC Circuit; Application 3-1 AC RL Circuit; Application 3-2 AC RLC Circuit; Application 4 Series Resonant Circuit; Application 5 Parallel Resonant Circuit; Application 6 Power in AC Circuit.

Lecture Book : Firat University Civil Aviation School, Electrical Fundamentals Laboratory II course notes.

David Irwin, R. Mark Nelms, Basic Engineering Circuit Analysis, Nobel Publishing, 2015.

Auxiliary Lecture Book : Susan A. Riedel, James W. Nilsson, Electrical Circuits, Palme Publications, 2012.

Hayt W., Kemmerly J., Durbin S., Engineering Circuit Analysis, McGraw-Hill, 2007.

UBO1107 Human Factors in Aviation (3 – 0) 3

General: Need for human factors consideration; Incidents attributable to human factors/human error; Murphy's Law; Human Performance and Limitations; Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access; Social Psychology; Responsibility: Individual and group; Motivation and demotivation; Age pressure; "Culture" issues; Teamwork; Management, supervision and leadership; Factors Affecting Performance; Fitness/health; Stress: Family and work-related; Time pressure and pressures related to completion times; Workload: Overload and underload; Sleep and fatigue, shift work; Alcohol, medication and drug use; Physical Environment; Noise and smoke; Lighting; Climate and temperature; Motion and vibration; Work environment; Tasks; Physical work; Repetitive tasks; Visual inspection; Complex systems; Communication; Communication within and between teams; Writing up and keeping records of work; Keeping it current and valid; Disseminating/disseminating/sharing information; Human Error; Error models and theories; Types of errors in maintenance tasks; Consequences of errors (i.e. accidents); Avoiding and managing errors; Hazards in the workplace; Recognizing and avoiding hazards; Dealing with emergencies.

Ders Kitabı:

- Firat Üniversitesi Sivil Havacılık Yüksekokulu, UÇAK TEMEL BİLGİSİ dersi ders notu
- Human Factors in Aviation, Second Edition [Paperback] 2006 Eduardo Salas (Editor), Florian Jentsch (Editor), Dan Maurino (Editor)

Yardımcı ders kitapları:

- Civil Aviation Authority of United Kingdom, (2002). Safety Regulation Group, “CAP 715 An Introduction to Aircraft Maintenance Engineering Human Factors for JAR 66”. Civil Aviation Authority: West Sussex.
- Civil Aviation Authority of United Kingdom, (2003). “CAP 716 Aviation Maintenance Human Factors (EASA /JAR145 Approved Organisations), Guidance Material on the UK CAA Interpretation of Part-145 Human Factors and Error Management Requirements”, Civil Aviation Authority: West Sussex.

UBO1108 Aviation Regulations (4-0-0) 4 ECTS

10.1 Role of ICAO, Turkish Civil Aviation Law No. 2920, DGCA structure and relations with authorities such as EASA and FAA. 10.2 Licensing of certifying staff under SHY-CA and SHT-66, duties of maintenance personnel. 10.3 Requirements for maintenance organisations under SHY-CA, SHT-145 approval process and organisational responsibilities. 10.4 Air operator certificates, MEL/CDL systems and operator obligations under SHT-OPS. 10.5 Certification principles under SHY-CA, SHT-21 and CS-23/25/27/29 including airworthiness, registration and noise certificates. 10.6 Continuing airworthiness requirements and implementation under SHY-21 and SHT-CAM. 10.7 Maintenance programmes, inspection obligations, airworthiness directives and service bulletins under national and international regulations.

Course Book: Aviation Regulations course notes, current DGCA legislation

Supplementary Books: EASA Part-66 Basic Handbook Module 10 – Aviation Legislation, SHY-CA, SHT-21, SHT-145, SHT-CAM official publications

UBO1109 Technical Drawing and Standarts (2-2) 4 ECTS

Specification 100 Document of the American Air Transport Association (ATA); Aeronautical standards including ISO, AN, MS, NAS and MIL and other applicable standards, Drawing types and diagrams, Drawing tools, Norm writing applications, Lines and areas of use, projections, Drawing Principles, Projections, Epure Plane, Drawing Principles and Three Views, Drawing Principles and Three Views, Drawing Principles and Three Views, Section Views, Drawing Principles and Detail drawings and dimensioning, Drawing Principles and Assembly drawings and dimensioning, Drawing Principles and Detail, Assembly, Section drawings and dimensioning, Drawing Principles and Detail, Assembly, Section drawings and dimensioning, Tolerance and Exercise Systems, Fits and Clearances, Tolerance and Exercise Systems, Fits and Clearances, Defining name/title block information; Microfilm, microfiche and computer presentations

UBO1110 Flight Theory (3- 0-3) 3 ECTS

Relationship between lift, weight, thrust and drag, Percolation rate ,Steady-state flight, performance, Theory of rotation, Load factor effect: pitch, flight envelope and structural limitations, Increasing lifting, Aircraft Aerodynamics and Flight Controls, Control with the use of elevon and ruddervator, High lifting devices; Slots, slats, flaps, Devices providing drag: Spoilers, lifting and lowering pads, speed brakes, Operation and effect of trim fletches, servo tabs, control surface bases, High Speed Flight, Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number

Lecture Book: TTS Integrated Training System

UBO1112 Bilgisayar Destekli Teknik Resim (2-2) 3 ECTS

The design development process covers the stages from problem identification to detailed design and evaluation. The role of Computer Aided Design tools in product development. Geometric modeling and Feature-based solid modeling.,

Ders Kitabı:

- Cad / Cam - Bilgisayar Destekli Çizim Ve Üretimin Temelleri, Ahmet Naci Çoklar, Faruk Ünsaçar, Nobel Akademik Yayıncılık

Yardımcı Ders Kitapları:

- Pro / Engineer Wildfire 2.0 Tasarım, Analiz, İmalat (CAD CAE CAM)
- Endüstriyel ve Mühendislik Ürün Tasarımcıları İçin Ürün Tasarımı, Analiz ve İmalatı
- Cevdet Göloğlu, Alparslan Öztürk, Seçkin Yayıncılık - Bilgisayar Kitapları

UBO2101 Electronic Fundamentals-I (3- 0-3) 3 ECTS

Semiconductors Diodes Diode symbols; Diode characteristics and properties; Series and parallel connected diodes; Silicon controlled rectifiers (SCR), light emitting diodes (LED), photoconductive diodes and varistors; Rectifier diodes; Testing of diodes; Materials, electron configuration, electrical properties; P-type and N-type materials: effects of accumulation in conductors, large or small elements, during conduction; PN junction in a semiconductor; potential development across an unbiased, forward biased and reverse biased PN junction; Diode parameters: peak reverse voltage, maximum forward current, temperature, frequency, leakage current, power consumption; Operation and functions of diodes in circuits: clippers, hold-ups, half and full wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed study of the operation and characteristics of SCRs (thyristors), LEDs, Schottky diodes, photoconductor diodes, varactor diodes, varistors, rectifier diodes and zener diodes; Transistors Transistor symbols; Component definition and orientation; Transistor characteristics and properties..

Lecture Book : HEE2101 Electronic Fundamentals I Lecture Notes/ Electronic Circuits, Halit Pastacı, Nobel Academic Publishing, 2015/ Electronic Devices and Circuit Theory, Louis Nashelsky, Robert L. Boylestad, Palme Publishing, 2010/ Analysis of Electrical and Electronic Circuits, Uğur Arifoğlu, Alfa Publishing, 2013/ Electronic Devices and Circuit Theory, Boylestad, R. and Nashelsky L. Prentice Hall International, Inc., 1999..

Auxiliary Lecture Book : Electronic Devices and Circuit Theory, Louis Nashelsky, Robert L. Boylestad, Palme Publishing, 2010, Analysis of Electrical Electronic Circuits, Uğur Arifoğlu, Alfa Publishing, 2013.

UBO2102 Electronic Fundamentals II (3- 0- 3) 3 ECTS

Transistors: Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors; Basic understanding of other transistor types and their uses; Application of transistors: Amplifier classes (A, B, C); Simple circuits including bias, decoupling, feedback and stabilization; Multistage/multi-stage circuit principles; cascades/sequentials, push-pull/push-pull, oscillators, multivibrators, flip-flops/bi-stable circuits.

Integrated Circuits: Definition and operation of logic and linear circuits; Introduction to the operation and function of the operational amplifier used as an integrator, differentiator, voltage follower, comparator; Connection methods of operating and amplifying stages: resistive, capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages and disadvantages of positive and negative feedback.

Printed Circuit Boards: Definition and use of printed circuit boards

Lecture Book : Electronic Devices and Circuit Theory, Boylestad, R. ve Nashelsky L., Prentice Hall International, Inc., 1999.

Auxiliary Lecture Books:

- Electrical Circuits and Systems - An Introduction for Engineers and Physical Scientists, A.M. Howatson.
- Fundamentals of Electric Circuit Analysis, C.Paul. Microelectronic Circuits, A.S. Sedra & K.C. Smith.
- The Analysis and Design of Linear Circuits, R.E. Thomas & A J. Rosa.

UBO2103 Electric Machines (3- 0-3) 4 ECTS

DC Motor/Generator Theory; Basic motor and generator theory; structure and purpose of components in a DC generator, Operation of current output and current flow direction in DC generators and factors affecting them; Operation of output power, torque, speed and rotation direction of DC motors and factors affecting them; Series wound, parallel wound and compound motors; Starter Generator structure, Structure and operating principles of transformers; Transformer losses and ways to prevent these losses; Behavior of transformers under loaded and unloaded conditions; Power transfer, efficiency polarity markings; Calculation of line and phase voltage and current; Power calculations in three-phase systems; Primary and secondary currents, voltages, winding ratios, power, efficiency; Autotransformers; AC Generators; Loop/circuit rotation in magnetic field and generated waveform; Operation and construction of rotating armature and rotating field type AC generators; Single phase,

two phase and three phase alternators; Three phase star and delta connection advantages and uses; Permanent/Permanent Magnet Generators, AC Motors; Structure and operating principles of both single-phase and polyphase AC synchronous and induction motors; Speed control and rotation direction methods; Speed control and rotation direction methods; Rotating field generating methods: capacitor, inductor, shaded or split pole.

Ders Kitabı : HEE2105 Lecture notes, Electric Motors and Drives, Ali Özdemir, Seçkin, 2014.

Yardımcı Ders Kitabı : TTS INTEGRATED TRAINING SYSTEM Module 3 Licence Category B1 Electrical Fundamentals, Electrical machines lecture notes Compiled by: Prof. Dr. Eyyüp ÖKSÜZTEPE

UBO2104 Gas Turbine Engine Theory (3-0-3) 3 ECTS

Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle. Relationship between force, work, power, energy, speed, acceleration. Force, work, power, energy, acceleration, speed. Turbojet, turbofan, turboshaft and turbopropeller structural arrangements and operation. Gross thrust, net thrust, conical nozzle thrust, thrust distribution, thrust horsepower, equivalent shaft horsepower, specific fuel consumption. Engine efficiencies (thrust efficiency, thermal efficiency, total efficiency and propeller efficiency). By-pass ratio and engine pressure ratio; Pressure, temperature and speed distributions of gas flow. Axial and centrifugal type compressors, working principles and applications. Combustion chamber structural features and working principles. Turbine types, features, working principles and applications. Exhaust structural features and working principles. Turbojet parametric ideal and actual cycle analysis. Turbofan parametric ideal and actual cycle analysis. Turboprop and turboshaft parametric ideal and actual cycle analysis

Textbook: Ahmed F. El-Sayed, Aircraft propulsion and gas turbine engines

Supplementary Textbooks: Mattingly, J.D. Elements of Propulsion: Gas Turbines and Rockets, Jack Mattingly, David T. Pratt, William H. Heiser, Aircraft Engine Design

UBO2105 Electric Machines Laboratory (0-2-1) 2 ECTS

Addressing the issue of cleaning and pollution control; DC Generators, foreign-excited generators; DC Generators, series, shunt, compound generators; DC generator power control, voltage adjustment, assembly and disassembly techniques and applications; DC Motors, series, shunt, compound generators; Single-phase Transformers, Transformation ratio determination, polarity determination, no-load operation, loaded operation; DC Motors, Three-phase transformers, measurement of line and phase voltages, connections; Asynchronous motors; Servo motors; DC Drive; Alternators, frequency and voltage adjustment; Alternators, loaded operation.

Lecture Book : Lecture notes, Electric Motors and Drives, Ali Özdemir, Seçkin, 2014. Deney föyleri, UEE201 Elektronik Esaslar I Ders Notu/ Elektronik Devreler, Halit Pastacı, Nobel Akademik Yayıncılık, 2015.

Auxiliary Lecture Book : Electric Motors and Drivers, Adem Altunsaçlı, Author, 2008., Electric Motors and Drives Pocket Book / Newnes, Austin Hughes, Bileşim Publishing, 2004., Electric Machinery, Fitzgerald, A.E., Kingsley, Charles., Umans, Stephen D, Mc Graw Hill, 2003.

UBO2106 Aerodynamics (3- 0-3) 3 AKTS

Air flow around an object, Boundary layer, laminar and turbulent flow, Free stream flow, Relative air flow, Upwash and downwash, vortices, flow stoppage, Obliquity, vector, mean, aerodynamic vector, profile (parasitic) drag, Induced drag, Centre of pressure, Angle of attack, Roughness ratio, smoothness ratio, wing shape and aspect ratio, Thrust, Weight, and the Resultant of Aerodynamic Forces, Formation of lift and drag, Angle of attack, lift coefficient, drag coefficient, polar inclination, stall, Profile deposits such as ice, snow and frost

Lecture Book: TTS Integrated Training System

UBO2107 Aircraft Structures (2-3-3) 4 ECTS

General structural concepts of the aircraft fuselage, coated fuselages, reinforcement rings, reinforcement elements such as stringers and longerons, fuselage beams, main ribs, connection elements, ply structures and sandwich structures. Coating methods, corrosion protection techniques, wing, tail assembly and engine connection areas. Structure assembly techniques (riveting, bolting, bonding), surface treatments (chroming, anodizing, painting). Surface cleaning, alignment methods and symmetry checks. Structure sealing, wing, pylon, landing gear and elevator connections; seat layout and cargo loading system. Doors, emergency exits, window and glass systems. Wing structure, fuel storage areas, high lift and drag elements. Stabilizer structure, control surface connections, balancing of flight control surfaces, nacelle and pylon structures, engine connections, fire walls. Cabin equipment and furnishing systems; emergency equipment, seat, belt and harness systems; cabin layout, entertainment systems, galley, stairs and cargo storage equipment.

Course Book: Hava Aracı Yapıları ders notları, TTS Modül 11

UBO2108 Termodinamik (3-0) 3 AKTS

Introduction to Thermodynamics: basic definitions and concepts, Matter; Structure of Matter: Chemical elements, structure of atoms, molecules; Chemical compounds, States: Solid, liquid and gas; Changes between states, Temperature: Thermometers and temperature scales: Celsius, Fahrenheit and Kelvin; Definition of Heat; Heat Capacity Specific Heat; Heat Transfer: transfer (convection), radiation and conduction, Volumetric Expansion (Expansion); First and Second Laws of Thermodynamics, Gases: Ideal Gas Laws, Specific Heat at Constant Volume and Constant Pressure, Work Done by Expanding Gases, Isothermal and Adiabatic Expansion and

Compression, Engine Cycles, Constant Volume and Constant Pressure, Refrigerators and Heat Pumps, Latent Heats of Melting and Vaporization, Thermal Energy, Heat of Combustion

Ders kitabı: Mühendislik yaklaşımıyla termodinamik, Yunus A. Çengel, İzmir Güven Kitabevi, 2012.

Yardımcı ders kitabı: Borgnakke C., Sonntag R.E, “Fundamentals of Thermodynamics”, International Student Version, 7th Edition, John Wiley & Sons, INC., 2009.

Supplementary Textbooks: EASA Part-66 Basic Handbook Modül 11, SHY Modül 11, JAMF ATA 52–57 yapısal sistemler dökümantasyonu

UBO2109 Fluid Mechanics (3 – 0 - 3) 4 AKTS

Specific Gravity and Density Work, Viscosity, Fluid Resistance, Effects of Laminar or Aerodynamic Flow; Static, Dynamic and Total Pressure: Bernoulli's Theorem and its applications, Venturi;

Book: Fırat Üniversitesi Sivil Havacılık Yüksekokulu, MEKANİK dersi ders notu • Klasik Mekanik, T W Kibble, Palme Yayıncılık, 1999.

Auxiliary Lecture Book: Mühendislikte Mekanik Statik, Sinan Çağdaş, İstanbul Gelişim Üniversitesi, 2014. • Mühendisler için Mekanik Statik ve Mukavemet Çözümlü Problemleri, Prof. Dr. Mehmet H. Omurtag, BETA BASIM YAYIM, 2003.

UBO2110 Electronic Instrument Systems (3-0-3) 3 ECTS

Electronic Instrument Systems; Typical system arrangements and cockpit layout of electronic instrument systems. Data Buses; Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications. Aircraft Network/Ethernet. Fiber Optics; Advantages and disadvantages of fiber optic data transmission versus electrical cable propagation; Fiber optic data bus; Terms associated with fiber optics; Terminals: Couplers, control terminals, remote terminals; Application of fiber optics in aircraft systems. Electronic Displays; Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes (CRT), Light Emitting Diode (LED), Liquid Crystal Display (LCD). Electrostatic Sensitive Devices; Special treatment of components sensitive to electrostatic discharges; Awareness of hazards and potential damage, component and personnel antistatic protection devices. Software Management Control; Awareness of restrictions associated with software programs, airworthiness requirements, and potential catastrophic consequences of unapproved changes to software programs. Electromagnetic Environment; EMC-Electromagnetic Compatibility, EMI-Electromagnetic Interference, HIRF-High Impact Electromagnetic Field, Lightning/lightning protection. Typical Electronic/Digital Aircraft Systems; General regulation for typical electronic/digital aircraft systems and associated BITE (Built-in Test Equipment) such as: ACARS-ARINC Communication and Addressing and Recording System, EICAS-Engine Indicating and Crew Alerting System, FBW-electronic flight control/electronic flight control systems (flyby-wire), FMS-Flight Management System, IRS-Inertial Navigation/Reference System; ECAM-Electronic

Central Aircraft Monitor, EFIS-Electronic Flight Instrument System, GPS-Global Positioning System, TCAS-Traffic Alert and Collision Avoidance System Integrated Modular Avionics, Cabin Systems, Information Systems.

Lecture Book : Fırat University School of Civil Aviation, Electronic Instrument Systems course lecture notes.

Auxiliary Lecture Book : TTS Integrated Training System. Module 5, Digital techniques and electronic instrument for EASA part-66. [Kempston, Bedford]: Total Training Support, 2009.

UBO2111 Materials and Equipment -I (3-0-3) 4 ECTS

Hava aracı materyalleri-Demirli (Ferrous): Hava araçlarında yaygın olarak kullanılan alaşımlı çeliklerin karakteristikleri, özellikleri ve tanımlanması; Alaşımlı çeliklerin ısıtılma işlemi ve uygulanması. Hava aracı materyalleri- Demir dışı (Non Ferrous); Hava araçlarında yaygın olarak kullanılan non-ferro (demir dışı) materyallerin karakteristikleri, özellikleri ve tanımlanması; Non- ferro (demir dışı) materyallerin ısıtılma işlemi ve uygulanması; Hava Aracı Materyalleri — Kompozit ve Metalik Olmayan: Ahşap ve kumaş dışında kompozit ve metalik olmayanlar; Hava araçlarında yaygın olarak kullanılan ahşap dışındaki kompozit ve metalik olmayan materyallerin karakteristikleri, özellikleri ve tanımlanması; Sızdırmaz ve yapıştırıcı maddeler;Kompozit ve metalik olmayan materyaldeki kusurların/bozulmaların tespiti; Kompozit ve metalik olmayan materyalin onarımı:Ahşap Yapılar; Ahşap gövde yapısına ilişkin yapım yöntemleri; Uçaklarda kullanılan ahşap ve yapıştırıcıların karakteristikleri ve özellikleri; Ahşap yapının korunması ve muhafaza edilmesi; Ahşap materyal ve ahşap yapı kusur türleri; Ahşap yapıdaki kusurların tespiti; Ahşap yapının onarımı. Ahşap materyal ve ahşap yapı kusur türleri; Ahşap yapıdaki kusurların tespiti; Ahşap yapının onarımı. Kumaş kaplama; Uçaklarda kullanılan kumaşların karakteristikleri, özellikleri ve türleri; Kumaş inceleme yöntemleri; Kumaşlardaki kusur türleri; Kumaş kaplamaların onarımı. Korozyon:Kimyasal esaslar; Galvanik işlem prosesi, gerilme yoluyla oluşum, mikrobiyolojik oluşum; Galvanik işlem prosesi, gerilme yoluyla oluşum, mikrobiyolojik oluşum;Korozyon türleri ve bunların tanımlanması; Korozyon sebepleri; Korozyona yatkın materyal türleri

Ders Kitabı:

- Fırat Üniversitesi Sivil Havacılık Yüksekokulu, MALZEME VE DONANIM I dersi ders notu

Yardımcı ders kitapları:

- TTS Integrated Training System. Module 6, Materials and hardware for EASA part-66. [Kempston, Bedford] : Total Training Support, 2009.

UBO2112 Materials and Equipment-II (3-0-3-3) 4 AKTS

Introduction to the course and introduction to the course. Fasteners-Fixed and removable joints. Screws-Bolts-Nuts geometries. Screw-Bolt sizing and types-properties manufacturing and usage areas. Screw-bolt nut types and standard designations used in aviation. Rivets. Rivet type-size-application and usage areas. Pipe-hose-record connections used in aviation: types and properties. Bearings and bearings; Springs: types, material properties, Washers-clutches-couplings-gears. Standard-bearing gear lubrication and maintenance procedures. Fabric and coating equipment in aircraft structures, types, properties and repair processes.

Textbook: Lecture notes (B.Aksakal).pdf

UBO2113 Vocational English-I (2-0-2-0) 3 AKTS

Introduction and speaking on aviation-1. Word order; locations; tense; Instructions; procedures; basic sentence structures. Word endings; prefix-suffix. Physical characteristics; dimensions; Purpose; conjunctions; actions. Possibility, probability, necessity. Comparisons; movements; active-passive-processes. Functions; states; failures. Exercises on previous topics. Word order and locations in aviation sector. Simplified English in Aviation sector. Exercises on general subjects.

Textbook: Lecture notes (B.Aksakal).pdf

UBO2114 Vocational English II (2-0-2) 3 ECTS

Grammar: Relative Clauses; Conjunctions and Transitions; Tag Questions

Vocabulary: Furnitures; Snacks; Vehicles; Common Buildings; Countries and Nationalities;

Speaking: Story-Telling; Talking about experiences; Talking about Future Plans; Talking about

Hypothetical Situations

Lecture Book: Understanding and Using English Grammar by B.S. Azar The Little Prince by S. Exupery The Old Man and the Sea by E. Hemingway

Auxiliary Lecture Book: Taşdelen, Berna. "Cornerstone for Grammar Practice", Ankara, Spring Publication, 2004

UBO2115 Unmanned Aerial Vehicles (2 – 0 - 2) 3 AKTS

Basic concepts and history. Unmanned and autonomous vehicles used in air, sea, land and space. UAV system components, UAV, ground control station. UAV system components, UAV, ground control station. UAV classification. National and international studies and legislation: EASA, FAA, SHGM UAV legislation. Regulations in unmanned aerial vehicles and air traffic control. Simulator technologies. Safe separation: airspace and requirements. (Midterm exam) Tail turbulence effects, safety layers. Operational concepts: general requirements, flight operations, unexpected events. Guidelines, regulatory standards and practical operational considerations for aerial photography and videography techniques specific to the use of Unmanned Aircraft Systems. Guidelines, regulatory standards and practical operational considerations for aerial photography and videography techniques specific to the use of Unmanned Aircraft Systems. Current procedures and related practical application methods.

Lecture Book: Handbook of Unmanned Aerial Vehicles, Springer; 2015th edition, ISBN-10:9048197066

UBO2116 Alternative Fuels in Aviation (2-0-2) 3 ECTS

Introduction and History of Fuels in Aviation, The Role of Fossil Fuels in Aviation, The Concept and Importance of Alternative Fuels, Biofuels – Definition and Production Methods, Synthetic Fuels (Synfuels), Hydrogen Fuels and Their Use, Electric and Hybrid Aircraft Systems, Environmental Impacts of Alternative Fuels, Economic and Logistical Challenges, Alternative Fuel Applications in Aviation, Safety and Performance Criteria, International Regulations and Standards, Future Technologies and Research

Textbook: Lecture notes and presentations; ICAO, EASA and ASTM reports; Scientific article summaries; Current industry reports (Boeing, Airbus, SAF initiatives etc.)

UBO2117 Model Air Vehicles (2-0-2) 3 ECTS

"Model aircraft design and development process, determination of components, detailed design of model aircraft parts, design optimization using Computer-Aided Design (CAD) tools, component design through geometric modeling and feature-based solid modeling, manufacturing of parts with a 3D printer, and assembly of the components."

Textbook:

- Cad / Cam - Bilgisayar Destekli Çizim Ve Üretimin Temelleri, Ahmet Naci Çoklar, Faruk Ünsaçar, Nobel Akademik Yayıncılık.

Supplementary Textbooks:

- Pro / Engineer Wildfire 2.0 Tasarım, Analiz, İmalat (CAD CAE CAM)
- Endüstriyel ve Mühendislik Ürün Tasarımcıları İçin Ürün Tasarımı, Analiz ve İmalatı
- Cevdet Göloğlu, Alparslan Öztürk, Seçkin Yayıncılık - Bilgisayar Kitapları

UBO2118 Artificial Intelligence in Aviation (2-0-2) 3 ECTS

Introduction to Artificial Intelligence: Definition, history and basic concepts, Introduction to Machine Learning: Supervised and unsupervised learning, Big Data and Data Types in Aviation (FDR, ACARS, CMS), Overview of Artificial Intelligence Application Areas in Aviation, Failure Prediction Systems and Predictive Maintenance, Failure Detection with Sensor Data: Basic principles, Simple Classification Models (Decision trees, k-NN), Midterm Exam / Case Study Application, Image Processing with Artificial Intelligence: Part analysis and surface damage detection, Analysis of Maintenance Reports with NLP (Natural Language Processing), Use of AI in Drones and Autonomous Systems, AI in Airline Operations: Passenger, flight and fleet optimization, Ethics, Safety and Regulations: Limits in AI applications, Final Presentations: Student project presentations and general evaluation

Textbook: Lecture notes, AI in Aviation – EASA Reports & Whitepapers, "Artificial Intelligence for Aviation" – Aircraft Technical Book Company

UBO2120 Algorithms and Programming (2-2-3) 4 ECTS

What is a computer? Introduction to programming, Algorithms and algorithm development, Basic and simple algorithm structures, Advanced algorithm structures, Introduction to Python programming language, Variables, constants and Python operators, Structured programming and conditional expressions, logical and mathematical expressions, control of program flow, Functions, Arrays, Libraries, File operations in Python.

Lecture Book : Python Training Book, Volkan Taşçı

Auxiliary Lecture Book : Python Programming from Zero to Expertise, Atıl Samancıoğlu

UBO2122 Microprocessors (2-2-3) 4 ECTS

Definition and Historical Development of Microprocessors, Processor Production Stages, Moore's Law, RAM, ROM, EPROM, EEPROM Structures, RISC and CISC Architectures, Comparison of Microprocessors and Microcontrollers, Number Systems, Microprocessor Architecture and Working Principle, Architectural Structure of 8085 8-bit Microprocessor, Pin Structure of 8085, Working Principle, Addressing Modes, Instruction Sets, 8085 Instruction Sets, 8255 Integrated Circuit, Assembly Programming, 16-bit Microprocessor Architecture and Examples (8086-8088), Memory Structures, Addressing Modes, 16-bit Microprocessor Instruction Sets, Interrupt System, Input/Output Systems, Timers and Counters in 16-bit Microprocessors, Memory Management in 16-bit Microprocessors, Data Communication Protocols, System Design, Basic Structure of PIC Microcontrollers, Architecture and Memory Structure, PIC Microcontroller Development Environments, MPLAB X IDE and XC8 Compiler, PIC Programming Languages, Digital Input/Output and Basic Applications, Timer, Interrupt and PWM Usage, Analog/Digital Converter and Serial Communication, Microcontroller Based System Control Design Applications

Lecture Books

Mikrodenetleyiciler ve PIC Programlama-Orhan Altınbaşak, Altaş Yayınları, 2004.

Mikrodenetleyici Programlama ve Assembler, Ali Ekber Özdemir, Nobel Yayınevi, 2015.

Mikroişlemciler ve 8051 Ailesi, Haluk Gümüşkaya, Alfa Yayınları, 2002.

Microprocessor Architecture Programming And Applications With The 8085, Rmesh S. Gaonkar, Prentice Hall Publisher, 2002.

The Intel Microprocessors, Barry B. Brey, Pearson Publisher, 2008.

MAT2154 Differential Equations (2 – 0 - 2) 2 ECTS

Differential Equation Concept: Solutions of differential equations; First Order and Degree Differential Equations: Differential equations that can be separated into variables, Homogeneous differential equations, Linear differential equations, Exact differential equations; Higher Order Linear Differential Equations with Constant Coefficients and Their Applications: Homogeneous equations, Non-homogeneous equations.

Lecture Book: Diferansiyel Denklemler, Richard Bronson, Çevirmen: Hilmi Hacısalihoğlu, Nobel Akademik Yayıncılık, 2013.

Auxiliary Lecture Book: Teori ve Çözümlü Problemlerle Diferansiyel Denklemler, Aladdin Şamilov, Nobel Akademik Yayıncılık, 2012. • Çözümlü Problemlerle Diferansiyel Denklemler, Metin Başarır, Değişim Yayınları, 2003.

UBO3101 Aircraft Electrical Systems (3-2-4) 4 ECTS

Installation and Operation of Batteries, DC Power Generation, DC Power Generation, AC Power Generation, AC Power Generation, Emergency Power Generation, Emergency Power Generation, Voltage Regulation/Adjustment, Power Distribution, Power Distribution, Inverters, Transformers, Rectifiers, Circuit Protection, External Power/Ground Power. External Lights, Internal Lights, Emergency Lights.

Textbook : TTS INEGRATED TRAINING SYSTEM Module 13 Licence Category B2 Aircraft Aerodynamics, Structures and Systems.

Supplementary Textbooks : Aircraft Electrical Systems lecture notes

UBO3102 Propellers (3-0-3) 3 ECTS

17.1 Fundamentals (1/4): Aerodynamic, centrifugal and torque forces acting on a propeller, 17.1 Fundamentals (2/4): Thrust modelling via actuator-disk theory, 17.1 Fundamentals (3/4): Blade-element theory, angle of attack, relative airflow, 17.1 Fundamentals (4/4): Vibration, resonance, performance losses, flow deviation, 17.2 Propeller Structure (1/2): Construction materials (wood, composite, metal) & manufacturing methods, 17.2 Propeller Structure (2/2): Blade surfaces, blade shank, hub attachment, pitch types, 17.3 Pitch Control (1/3): Mechanical & hydraulic pitch-changing systems, 17.3 Pitch Control (2/3): Electrical & electronic pitch-control systems, 17.3 Pitch Control (3/3): Feathering, reverse pitch & overspeed-protection systems , 17.4 Synchronisation: Synchronisation & synchrophasing principles; equipment overview, 17.5 Icing Protection: Fluid vs. electrical de-icing systems, 17.6 Propeller Maintenance (1/2): Static & dynamic balancing, blade-tracking techniques , 17.6 Propeller Maintenance (2/2): Damage types, corrosion, erosion, delamination, repair schemes, 17.7 Storage & Preservation: Propeller storage procedures and return-to-service practices.

UBO3103 Aircraft Systems-I (3-2-4) 4 ECTS

Engine bleed, APU and ground cart, external air supply sources; Air conditioning systems; Air cycle and vapor cycle machine; Distribution systems; Flow, temperature and humidity control system, Pressurization systems; Controls and indicators including control and safety valves; Cabin pressure controls. Oxygen System layout; Cockpit, cabin, Sources, storage, filling and distribution; Supply adjustment; Indicators and warnings. Pneumatic and Vacuum System layout; Sources; Engine/API, compressors, reservoirs, ground supply; Pressure control; Distribution; Indicators and warnings; Interface with other systems.

Course Book : TTS INEGRATED TRAINING SYSTEM Module 13 Licence Category B2 Aircraft Aerodynamics, Structures and Systems

Supplementary Textbooks : Aircraft Systems-I lecture notes.

UBO3104 Aircraft Systems-II (3-2-4) 4 ECTS

Fire and smoke detection and warning systems; Fire extinguishing systems; System tests; Portable fire extinguishers. Fuel system layout; Fuel tanks; Supply/Feed systems; Lowering, venting and evacuation; Cross-feed and transfer; Indicators and alerts; Refueling and defueling; Longitudinal balance fuel systems. Ice formation, classification and detection; Anti-icing systems: electrical, hot air and chemical; De-icing systems: electrical, hot air, pneumatic, chemical; Rain removal; Probe and drain heating; Wiper systems. Water system layout, supply, distribution, service and evacuation; Toilet system layout, flushes and service.

Textbook : TTS INEGRATED TRAINING SYSTEM Module 13 Licence Category B2 Aircraft Aerodynamics, Structures and Systems.

Supplementary Textbooks : Aircraft Electrical Systems lecture notes

UBO3105 Electronic Instrument Systems I (3-2-4) 4 ECTS

Electronic Instrument Systems; Typical system arrangements and cockpit layout of electronic instrument systems. Data Buses; Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications. Aircraft Network/Ethernet. Fiber Optics; Advantages and disadvantages of fiber optic data transmission versus electrical cable propagation; Fiber optic data bus; Terms associated with fiber optics; Terminals: Couplers, control terminals, remote terminals; Application of fiber optics in aircraft systems. Electronic Displays; Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes (CRT), Light Emitting Diode (LED), Liquid Crystal Display (LCD). Electrostatic Sensitive Devices; Special treatment of components sensitive to electrostatic discharges; Awareness of hazards and potential damage, component and personnel antistatic protection devices. Software Management Control; Awareness of restrictions associated with software programs, airworthiness requirements, and potential catastrophic consequences of unapproved changes to software programs. Electromagnetic Environment; EMC-Electromagnetic Compatibility, EMI-Electromagnetic Interference, HIRF-High Impact Electromagnetic Field, Lightning/lightning protection. Typical Electronic/Digital Aircraft Systems; General regulation for typical electronic/digital aircraft systems and associated BITE (Built-in Test Equipment) such as: ACARS-ARINC Communication and Addressing and Recording System, EICAS-Engine Indicating and Crew Alerting System, FBW-electronic flight control/electronic flight control systems (flyby-wire), FMS-Flight Management System, IRS-Inertial Navigation/Reference System; ECAM-Electronic Central Aircraft Monitor, EFIS-Electronic Flight Instrument System, GPS-Global Positioning System, TCAS-Traffic Alert and Collision Avoidance System Integrated Modular Avionics, Cabin Systems, Information Systems.

Lecture Book : Firat University School of Civil Aviation, Electronic Instrument Systems course lecture notes.

Auxiliary Lecture Book : TTS Integrated Training System. Module 5, Digital techniques and electronic instrument for EASA part-66. [Kempston, Bedford]: Total Training Support, 2009.

UBO3106 Aircraft Instrument Systems-II (3-2-4) 4 ECTS

Central maintenance computers, data loading system, electronic library system, output/printing, Structural tracking, Integrated Modular Avionics, Cabin Systems, Data/Radio Communication, In-Flight Entertainment System, Cabin Main System, In-Flight Entertainment System, External Communication System, Cabin Mass Memory System, Cabin Monitoring System, Access to pre-flight/takeoff reports, Email/intranet/Internet access, Passenger database, Aircraft General Information System, Flight Compartment Information System, Maintenance Information System, Passenger Cabin Information System.

Textbook: TTS INTEGRATED TRAINING SYSTEM Module 13 License Category B1 Aircraft Aerodynamics, Structures and Systems.

Supplementary Textbooks: Aircraft Instrument Systems-II lecture notes.

UBO3107 Gas Turbine Engine Systems-I (3- 0-3) 4 ECTS

Operation of engine starting system and components. Ignition systems and components. Lubrication system operation/layout and components. Lubrication systems; Constant pressure system, Full flow system. Engine bearings and seals, structural features and operating principles. Engine internal air system; Operating principle; System components; Compressor flow control systems; VSV, VBV, TBV. Engine internal air system; Operating principle; System components; Compressor flow control systems; VSV, VBV, TBV. Engine internal air system; Turbine active clearance control system; Anti-icing system, Cooling system. Fuel system; System components; Fuel metering principles. Fuel system; Hydromechanical fuel control units; Governing, restriction and metering sections. Fuel system; Constant speed control; Constant thrust control. Fuel system; FADEC. Engine indicating systems; Engine performance indicator; Torque meter; N1; EPR. Engine system indicators; Oil temperature, pressure and quantity indicators; Fuel flow; EGT; Vibration indicator

Textbook: TTS INTEGRATED TRAINING SYSTEM Module 15 (Gas turbine engine) License Category B1 Turbine Aeroplane Aerodynamics, Structures and Systems

Supporting Textbooks: Karakoç H.K., Turgut E.T., Gas Turbine Engine Systems, Anadolu University Publications, ISBN 978-97506-0534-5, 01/07/2008 Systems of commercial turbofan engines

UBO3108 Gas Turbine Engine Systems II (3-0-3) 4 ECTS

Exhaust structural features and operating principles; Convergence, divergence and variable field nozzles; Reduction of engine noise; Power Augmentation Systems Operation and applications; Water injection, water methanol; Afterburner systems. Reverse thrust systems and operating principles. Turbo-prop Engines Gas coupled/free turbine and gear coupled turbines; Reduction gears; Integrated engine and propeller controls; Overspeed safety devices. Turbo-shaft Engines Adjustments, drive systems, reduction gearing, clutches, control systems. Auxiliary Power Units (APUs) Purpose, operation, protective systems Engine Assembly (Installation) Configuration of fire walls, engine covers, acoustic panels, engine bearings, anti-vibration bearings. Configuration of connecting hoses, feeders, connectors, conduits, control cables and rods, lifting points and drains. Engine Monitoring/Following and Ground Start-up Procedures for engine start-up and ground start-up. Interpretation of

engine power output and parameters; Trend monitoring/tracking (including oil analysis, vibration and borescope). Inspection (checking) of engine and components against criteria, tolerances and data specified by the engine manufacturer; Compressor flushing/cleaning; Foreign Object Damage. Engine Storage and Preservation, Preservation and removal of engine and accessories/systems.

Textbook: TTS INTEGRATED TRAINING SYSTEM Module 15 (Gas turbine engines) License Category B1 Turbine Aeroplane Aerodynamics, Structures and Systems

Supplementary Textbooks: Karakoç H.K., Turgut E.T., Gas Turbine Engine Systems, Anadolu University Publications, ISBN 978-97506-0534-5, 01/07/2008 Systems of commercial turbofan engines

UBO3109 Materials and Inspection Methods (2-3-3) 3 AKTS

Introduction to the course and introduction to the course. Classification and general properties of metallic materials. Mechanical properties of metallic materials and affecting factors. Tensile tests -test conditions and inspection methods- theory and experiment. Elastic-plastic behavior of metallic materials with force. Analysis of the quantities obtained in tensile tests - study problems. Hardness tests and types of metallic materials. Impact tests and general fracture theory of metallic materials. Fatigue-creep tests - theoretical information. Non-destructive testing methods (NDT) -Ultrasonic testing- theory and experiment. Liquid penetrant testing- theory and experiment. Radiological testing - theory and experiment. Magnetic particle testing - theory and experiment. Fabric and coating equipment in aircraft structures, types, properties and repair processes.

Textbook: Lecture notes (B.Aksakal).pdf

UBO3110 Maintenance Procedures (2- 2-3) 3 ECTS

Maintenance planning; Maintenance Procedures at BKEK; Modification procedures; Depot procedures; Certification/release from maintenance procedures; Interface to aircraft operation; Maintenance Inspection (Control)/Quality Control/Quality Assurance; Additional maintenance procedures; Control of life-cycle parts.

Lecture Book : TTS Integrated Training System Module 7 Licence Category B1 Maintenance Practices.

Auxiliary Lecture Book: Maintenance Procedures and Practices lecture notes.

UBO3111 Flight Control (3-0-3) 3 ECTS

Classification of flight control surfaces, aircraft axes and movements, basic control systems, cable transmission, gearboxes used in mechanical transmission, screw-jack, torque limiters and override mechanisms, hydraulic transmission systems, servo control, trim and feel units. Structure of control surfaces, balance weights, deflection limits and rigging principles. Hydraulic supply and distribution systems, takeoff warning systems. Operation of primary flight controls such as aileron, rudder and elevator, rudder tail mechanisms and elevator feel system. EFCS architecture, modes, protection functions and failure scenarios. Operation, protection and maintenance practices related to horizontal stabilizer, flap/slat system, PCUs, spoiler and speed-brake systems.

Course Book: UBO3110 Uçuş Kumandaları ders notları, JAMF ATA 27.1 – 27.2 – 27.3, TTS Modül 11.9

Supplementary Textbooks: FAA Airplane Flying Handbook – Bölüm 6: Flight Controls, OEM Flight Controls Systems Maintenance Manual (Örn.: Boeing 737 AMM Chapter 27)

UBO3112 Aircraft Systems (3 – 2 - 4) 4 ECTS

System layout, Hydraulic fluids, Hydraulic reservoirs and accumulators, Pressure generation: electrical, mechanical, pneumatic, Emergency pressure generation, Arithmetic, relational and logical operators, Filters, Pressure control, Power distribution, Indicating and warning systems, Interface with other systems, Structure, shock absorption, Opening and collecting systems; normal and emergency, Indicators and warnings, Wheels, brakes, anti-skid and auto-braking, Tyres, Steering, Air-ground sensing.

Course Book: TTS Integrated Training System

UBO3113 Aircraft Maintenance Terminology I (2- 0-2) 2 ECTS

Tools/Assemblies, Commonly used types of hand tools; Commonly used types of power tools; Operation and use of precision measuring instruments. Avionics General Test Equipment, Operation, functions and use of general avionics test equipment. Engineering Drawings, Diagrams and Standards, Drawing types and diagrams, symbols, dimensions, tolerances and projections; Wiring diagrams and schematic diagrams.

Lecture Book: TTS Integrated Training System Module 7 Licence Category B1 Maintenance Practices.

Auxiliary Lecture Book: Aircraft Maintenance Terminology I Lecture Notes.

UBO3114 Aircraft Maintenance Terminology -II (2- 0-2) 2 AKTS

Aircraft Maintenance Manual (AMM) Structure and Terminology. ATA 100 and ATA Chapter Codes. Technical Document Types: MEL, IPC, SRM, WDM. Aircraft Fuel System Terminology. Hydraulic Systems and Landing Gear Terminology. Air Conditioning and Pressurization Systems. Electrical System Terminology. Flight Control Systems. Avionic Systems and Display Units. Engine (Powerplant) Terminology I – General Definition. Engine

Systems II – Lubrication and Fuel. Engine Systems III – Starting and Ignition. Troubleshooting and Malfunction Terminology. Task Reading and Analysis on AMM or IPC Page.

Course Book: FAA-H-8083-30B, Aviation Maintenance Technician Handbook – General, Powerplant

Supplementary Textbooks: DHMi-Havacilik-Terimleri-Sozlugu

UBO3115 Aircraft Fuels (3-0-3) 3 AKTS

Fuel used in aircraft, Goods acceptance, Tanker filling, Fuel and oil handling, Tanker roll over, Fuel withdrawal, Fuel quality control, Instructions, procedures, Aircraft fueling with tankers, Aircraft fueling with dispensers, Tanker filling with dispensers, Static electricity, High risk operations, Periodic tests.

Textbook:

- Aviation Fuels with Improved Fire Safety, Natioanal Research Council, National Academy Press, 1997.

Supplementary Textbooks:

- Aircraft Fuel Systems, Roy Langton, Chuck Clark, Martin Hewitt, Lonnie Richards, Wiley, 2009

UGM3116Avionics Systems (3-0-3) 3 ECTS

Electromagnetic spectrum, radio waves and communication frequencies; antenna structures, transmitter-receiver principles and basic RF circuits; aircraft communication systems including VHF, HF, ELT, and CVR. Introduction to navigation and basic methods, ADF systems and characteristics of NDB ground stations, VOR system and direction-finding principles. Structure of the ILS, localizer and glide slope principles; marker beacons and ILS-related auxiliaries. MLS system and differences from ILS; DME and Doppler radar principles. Operating principles of radio altimeters and the GPWS system. Introduction to automatic flight systems and their primary purposes; autopilot components and their effects on flight axes. Control loops, functions and implementations in automatic flight.

Course Book: UGM3114 Avionics Systems lecture notes, TTS Module 11.5.2

Supplementary Books: FAA Avionics Handbook, EASA Part-66 Module 11.5.2

UBO3117 Aircraft Design (3- 0-3) 3 AKTS

Introduction to Aircraft Design. Fundamental Principles of Flight and Classification of Aircraft. Body Configuration and Cabin Layout. Wing Design. Tail and Stability Elements. Landing Gear Design. Engine and Propulsion Systems. Basic Aerodynamic Calculations. Structural Loads and Material Selection. Aircraft Systems

and Layouts. Safety, Escape and Certification Requirements. Design Process and Software-Aided Vehicles Overview. Simple Design Scenario (Student Application). End-of-Term Presentations and General Evaluation.

Course Book: Uçak Tasarımı ve Performansı – İsmail H. Güzel

Supplementary Textbooks: Aircraft Design: A Conceptual Approach – Daniel P. Raymer

UBO3119 Electromagnetic Environment (3-0-3) 3 ECTS

Electromagnetic Environment: EMC-Electromagnetic Compatibility, Electromagnetic Environment: EMC-Electromagnetic Compatibility, Electromagnetic Environment: EMC-Electromagnetic Compatibility, Electromagnetic Environment: EMI-Electromagnetic Interference, Electromagnetic Environment: EMI-Electromagnetic Interference, Electromagnetic Environment: EMI-Electromagnetic Interference, Electromagnetic Environment: HIRF-High Influential Electromagnetic Field, Electromagnetic Environment: HIRF-High Influential Electromagnetic Field, Electromagnetic Environment: HIRF-High Influential Electromagnetic Field, Lightning/lightning protection, Lightning/lightning protection, Electromagnetic Environment: EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-The effect of High Intensity Electromagnetic Field effects on maintenance practices related to electronic systems, Electromagnetic Environment: EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-The effect of High Intensity Electromagnetic Field effects on maintenance practices related to electronic systems, Electromagnetic Environment: EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-The effect of High Intensity Electromagnetic Field effects on maintenance practices related to electronic systems

Supplementary Textbooks:

- TTS Integrated Training System. Module 5, Digital techniques and electronic instrument for EASA part-66. [Kempston, Bedford] : Total Training Support, 2009.

UBO3120 Helicopter Theory (3-0-3) 3 ECTS

History of the helicopter, Vertical take-off/landing aircraft, Fundamentals of helicopter flight, Basic motions, Introduction to rotor aerodynamics, Climb and descend motions, Factors affecting vertical motion, Forward flight, Analysis of blade motion, Basic helicopter performance, Helicopter conceptual design, Rotary Wing Aerodynamics, Operation and effect of speed, collective and anti-torque controls, Operation and effect of speed, collective and anti-torque controls

Lecture Books

Principles of Helicopter Aerodynamics, G. Leishman, Cambridge Uni. Press, 2006

UBO3122 Fracture Mechanics (3-0-3) 3 ECTS

Fundamentals of Fracture Mechanics, Material Defects, Basic Principles, Development of Fracture Mechanics, Elasto Plastic Fracture, Fatigue Fracture, Applications of Fracture Mechanics, Fracture Mechanics Problems.

Lecture Books

Kırılma Mekaniğine Giriş Ders Notları, Doç Dr. M. Evren TOYGAR, Dokuz Eylül Üniversitesi.

Anderson, "Fracture Mechanics Fundamentals and Applications."

Richard W.Hertzberg, "Deformation and Fracture Mechanics Of Engineering Materials."

Auxiliary Lecture Books

Dowling, "Mechanical Behavior of Materials"

Broek, "Elementary Engineering Fracture Mechanics"

Ağah Uğuz, "Kırılma Mekaniğine Giriş"

UBO3123 Creep and Fatigue (3-0-3) 3 ECTS

What is failure? What are the types of failure? How to detect, What is fatigue, Cyclic Loading, S-N Curves, Short Life Fatigue, Structural Properties of Fatigue, Fatigue Crack Progression, Fatigue life calculation, Fatigue test, Fatigue test, Factors affecting fatigue properties, Fatigue problems, Fatigue problems, High temperature damage to materials, What is creep damage? Structural Changes During Creep, Creep test, Creep mechanisms and calculation of creep life, case studies, Creep mechanisms and calculation of creep life, case studies

Lecture Books

The Practical Use of Fracture Mechanics, David Broek, Kluwer Academic Publishers. Elementary Engineering Fracture Mechanics, David Broek, Martinus Nijhoff Publishers

UBO3124 Piston Engines (3-0-3) 3 ECTS

Introduction to internal combustion engines: Classification, areas of use, basic definitions, Thermodynamic cycles: Analysis of Otto, Diesel, Wankel cycles, Main engine components: Cylinder, piston, piston rings, crankshaft, connecting rod, camshaft, Valve train and timing systems, Fuel systems: Comparison of carburettor and injection systems, Ignition systems: Conventional and electronic ignition systems, spark plug and coil function, Lubrication systems: Oil types, pump types, oil circuit, oil filter, Cooling systems: Water and air cooling systems, radiator, thermostat, antifreeze, Intake and exhaust systems: Air filters, exhaust manifolds, turbocharging systems, Engine performance parameters: Torque, power, efficiency, specific fuel consumption, Exhaust emissions and environmental effects: Emission control systems (EGR, catalytic converter, etc.), Engine testing methods: Compression test, vacuum test, exhaust analysis, Troubleshooting and maintenance techniques: Common engine faults, noise, smoke, performance analysis, Troubleshooting and maintenance techniques: Common engine faults, noise, smoke, performance analysis

Lecture Books

UBO4101 Internship (0-2-1) 5 ECTS

The internship course is conducted during weekly class hours, within the framework of the principles set forth in the “Fırat University SHYO-HEE Internship Directive” and “Intra-Department Student Internship Directive”. Midterm exam grades are given based on the students’ work performance at the internship site, 40% of the grade on the evaluation form filled out by the workplace and 60% of the grade they received from their internship notebooks. Students present their work related to their internships to the relevant jury and students visually and verbally. At the end of the presentation, general exam grades are determined.

Lecture Book

UBO4102 Graduation Project (0-2-1) 5 ECTS

Project, research, experiment and observation, report preparation, etc. concepts. Determining the project topic, project proposal, creation. Project management (Planning, proposal, time management, cost). Implementation of the project work plan, documentation of the achieved results.

UBO4103 Internship (0-2-1) 5 ECTS

The internship course is conducted during weekly class hours, within the framework of the principles set forth in the “Fırat University SHYO-HEE Internship Directive” and “Intra-Department Student Internship Directive”. Midterm exam grades are given based on the students’ work performance at the internship site, 40% of the grade on the evaluation form filled out by the workplace and 60% of the grade they received from their internship notebooks. Students present their work related to their internships to the relevant jury and students visually and verbally. At the end of the presentation, general exam grades are determined.

Lecture Book

UBO4104 Graduation Project (0-2-1) 5 ECTS

Project, research, experiment and observation, report preparation, etc. concepts. Determining the project topic, project proposal, creation. Project management (Planning, proposal, time management, cost). Implementation of the project work plan, documentation of the achieved results.

UBO4105 Workplace Practice (0-20-10) 25 ECTS

Introduction to Aircraft Maintenance Planning, Modification Procedures, Store Procedures, Certification/Removal Procedures, Interface to Aircraft Operation, Lightning Strike and HIRF Post-Checks, Abnormal Event Post-Checks, Structure, Shock Absorption, Opening and Retrieval Systems;, Normal and Emergency, Indicators and Warnings, Wheels and Tires; Brakes, Auto-Braking, Skid and Scrape Prevention, Air Ground Sensing and Tail

Buffer, System Layout; Crew, Passenger, Final Review, of Resources, Storage, Filling and Distribution, Feed Adjustment and Indicators and Warnings

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7

UBO4106 Workplace Practice (0-20-10) 25 ECTS

Introduction to Aircraft Maintenance Planning, Modification Procedures, Store Procedures, Certification/Removal Procedures, Interface to Aircraft Operation, Lightning Strike and HIRF Post-Checks, Abnormal Event Post-Checks, Structure, Shock Absorption, Opening and Retrieval Systems;, Normal and Emergency, Indicators and Warnings, Wheels and Tires; Brakes, Auto-Braking, Skid and Scrape Prevention, Air Ground Sensing and Tail Buffer, System Layout; Crew, Passenger, Final Review, of Resources, Storage, Filling and Distribution, Feed Adjustment and Indicators and Warnings

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7

UBO4107 Maintenance Workshop-I (0-4-2) 5 ECTS

Welding, Coating, Soldering and Bonding, Aircraft Weight and Balance, Aircraft Weight and Storage

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7 Licence Category B1 Maintenance Practices

Auxiliary Lecture Books

Bakım Prosedürleri ve Uygulamaları ders notları, Derleyen: Doç. Dr. Hülya KAFDELEN ODABAŞI

UBO4108 Maintenance Workshop-II (0-4-2) 5 ECTS

Welding, Coating, Soldering and Bonding, Aircraft Weight and Balance, Aircraft Weight and Storage

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7 Licence Category B1 Maintenance Practices

Auxiliary Lecture Books

Bakım Prosedürleri ve Uygulamaları ders notları, Derleyen: Doç. Dr. Hülya KAFDELEN ODABAŞI

UBO4109 Aircraft Maintenance Workshop (0-4-2) 5 ECTS

Safety Precautions-Aircraft and Workshop; Phases of safe work practices including safety precautions to be taken when working with electricity, gases especially oxygen, oils and chemicals. Also, instructions on remedial actions to be taken in case of a fire or other accident that may occur with one or more of these hazards, including information on extinguishing agents. Workshop Practices, Maintenance of tools, control of tools

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7 Licance Category B1 Maintance Practices

Auxiliary Lecture Book

Elektrik makinaları ders notları Derleyen: Dr. Öğr. Üyesi Yusuf ER

UBO4110 Aircraft Maintenance Workshop (0-4-2) 5 ECTS

Safety Precautions-Aircraft and Workshop; Phases of safe work practices including safety precautions to be taken when working with electricity, gases especially oxygen, oils and chemicals. Also, instructions on remedial actions to be taken in case of a fire or other accident that may occur with one or more of these hazards, including information on extinguishing agents. Workshop Practices, Maintenance of tools, control of tools

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7 Licance Category B1 Maintance Practices

Auxiliary Lecture Book

Elektrik makinaları ders notları Derleyen: Dr. Öğr. Üyesi Yusuf ER

UBO4111 Mechanic Maintenance Workshop (0- 4-2) 5 AKTS

Course Introduction and Basic Workshop Rules. Introduction to Riveted Joints. Rivet Clearance, Spacing and Throw. Riveting Tools. Dimpling Techniques. Inspection of Riveted Joints. Bending and Belling of Pipes. Inspection and Testing of Pipes and Hoses. Assembly and Connection of Pipes. Inspection and Testing of Springs. Inspection and Cleaning of Bearings. Bearing Lubrication Techniques and Defects. Riveting, pipe clamp, bearing cleaning case studies-1. Riveting, pipe clamp, bearing cleaning case studies-2.

Course Book: TTS Integrated Training System. Module 7, Maintenance .

Supplementary Textbooks: Michael J. Kroes, William A. Watkins, Frank Delp, Aircraft Maintenance and Repair

UBO4112 Mechanic Maintenance Workshop (0- 4-2) 5 AKTS

Course Introduction and Basic Workshop Rules. Introduction to Riveted Joints. Rivet Clearance, Spacing and Throw. Riveting Tools. Dimpling Techniques. Inspection of Riveted Joints. Bending and Belling of Pipes. Inspection and Testing of Pipes and Hoses. Assembly and Connection of Pipes. Inspection and Testing of Springs. Inspection and Cleaning of Bearings. Bearing Lubrication Techniques and Defects. Riveting, pipe clamp, bearing cleaning case studies-1. Riveting, pipe clamp, bearing cleaning case studies-2.

Course Book: TTS Integrated Training System. Module 7, Maintenance .

Supplementary Textbooks: Michael J. Kroes, William A. Watkins, Frank Delp, Aircraft Maintenance and Repair

UBO4113 Gas Turbine Engine Workshop (0-4-2) 5 AKTS

14.1 Turbine Engines (a) Structural adjustments and operation of turbojet, turbofan, turboshaft and turbopropeller engines; (b) Electronic Engine control and fuel measurement systems (FADEC). 14.2 Engine Indicator Systems Exhaust gas temperature / turbine temperature systems between stages; Engine speed; Engine Thrust Indicator: Engine Pressure Ratio, engine turbine Deceleration pressure or jet (exhaust) pipe pressure systems; Oil pressure and temperature; Fuel pressure, temperature and current; Manifold pressure; Engine torque; Propeller speed 14.3 Start/Start and Ignition Systems Operation of the engine start system and its components; Ignition systems and components; Maintenance safety requirements.

Textbook:

- TTS INEGRATED TRAINING SYSTEM.

Supplementary Textbooks:

- Gaz Türbinli Motor Uygulamaları Ders Notları Derleyen: Dr. Öğr. Üyesi Burak TANYERİ

UBO4114 Gas Turbine Engine Workshop (0-4-2) 5 AKTS

14.1 Turbine Engines (a) Structural adjustments and operation of turbojet, turbofan, turboshaft and turbopropeller engines; (b) Electronic Engine control and fuel measurement systems (FADEC). 14.2 Engine Indicator Systems Exhaust gas temperature / turbine temperature systems between stages; Engine speed; Engine Thrust Indicator: Engine Pressure Ratio, engine turbine Deceleration pressure or jet (exhaust) pipe pressure systems; Oil pressure and temperature; Fuel pressure, temperature and current; Manifold pressure; Engine torque; Propeller speed 14.3 Start/Start and Ignition Systems Operation of the engine start system and its components; Ignition systems and components; Maintenance safety requirements.

Textbook:

- TTS INEGRATED TRAINING SYSTEM.

Supplementary Textbooks:

- Gaz Türbinli Motor Uygulamaları Ders Notları Derleyen: Dr. Öğr. Üyesi Burak TANYERİ

UBO4115 Electrical Maintenance Workshop-I (0-4-2) 5 ECTS

Cable types, structures, and characteristics; high voltage and coaxial cables; crimping; connector types, pins, sockets, plugs, insulators; operation, functions, and use of general avionics test equipment; continuity, insulation, and bonding techniques and testing procedures; use of hand and hydraulically operated bending tools; testing of bend connections; removal and insertion of pins from/into connectors; coaxial cables: testing procedures and assembly precautions; identification of types of electrical lines, inspection criteria, and damage tolerances; protection techniques in electrical lines: cable protection braid and braid support; cable clamps, protective sleeve techniques (including heat-shrink wrap), shielding processes; EWIS (Electrical Wiring Interconnection System): assembly, inspection, repair, maintenance, and cleaning standards.

Textbook: TTS INTEGRATED TRAINING SYSTEM Module 13 License Category B1 Aircraft Aerodynamics, Structures and Systems.

Supplementary Textbooks: Electrical Maintenance Workshop-I lecture notes.

UBO4116 Electrical Maintenance Workshop-II (0-4-2) 5 ECTS

Cable types, structures, and characteristics; high voltage and coaxial cables; crimping; connector types, pins, sockets, plugs, insulators; operation, functions, and use of general avionics test equipment; continuity, insulation, and bonding techniques and testing procedures; use of hand and hydraulically operated bending tools; testing of bend connections; removal and insertion of pins from/into connectors; coaxial cables: testing procedures and assembly precautions; identification of types of electrical lines, inspection criteria, and damage tolerances; protection techniques in electrical lines: cable protection braid and braid support; cable clamps, protective sleeve techniques (including heat-shrink wrap), shielding processes; EWIS (Electrical Wiring Interconnection System): assembly, inspection, repair, maintenance, and cleaning standards.

Textbook: TTS INTEGRATED TRAINING SYSTEM Module 13 License Category B1 Aircraft Aerodynamics, Structures and Systems.

Supplementary Textbooks: Electrical Maintenance Workshop-I lecture notes.

UBO4117 Maintenance Practices-I (0-4-2) 5 ECTS

Aircraft Weight and Storage, Disassembly, Assembly and Repair, Control Techniques, Replacing various Avionic LRUs and performing BITE tests

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7 Licance Category B1 Maintance Practices

Auxiliary Lecture Books

Bakım Prosedürleri ve Uygulamaları ders notları, Derleyen: Doç. Dr. Hülya KAFDELEN ODABAŞI

UBO4118 Maintenance Practices-II (0-4-2) 5 ECTS

Aircraft Weight and Storage, Disassembly, Assembly and Repair, Control Techniques, Replacing various Avionic LRUs and performing BITE tests

Lecture Books

TTS INEGRATED TRAINING SYSTEM Module 7 Licance Category B1 Maintance Practices

Auxiliary Lecture Books

Bakım Prosedürleri ve Uygulamaları ders notları, Derleyen: Doç. Dr. Hülya KAFDELEN ODABAŞI

UBO4119 Aircraft Maintenance Practices Workshop-I (0-4-2) 5 ECTS

Use of workshop materials; Calibration of tools and equipment, calibration standards, Tools/Tools, Commonly used types of hand tools; Commonly used types of power tools; Operation and use of precision measuring

instruments; Lubrication equipment and lubrication methods, Aircraft Weight and Balance, Aircraft Handling and Storage, Disassembly and assembly techniques, Troubleshooting techniques.

Lecture Books

TTS INEGRTED TRAINING SYSTEM Module 7 Licance Category B1 Maintance Practices

Auxiliary Lecture Book

Elektrik makinaları ders notları Derleyen: Dr. Öğr. Üyesi Yusuf ER

UBO4120 Aircraft Maintenance Practices Workshop-II (0-4-2) 5 ECTS

Use of workshop materials; Calibration of tools and equipment, calibration standards, Tools/Tools, Commonly used types of hand tools; Commonly used types of power tools; Operation and use of precision measuring instruments; Lubrication equipment and lubrication methods, Aircraft Weight and Balance, Aircraft Handling and Storage, Disassembly and assembly techniques, Troubleshooting techniques.

Lecture Books

TTS INEGRTED TRAINING SYSTEM Module 7 Licance Category B1 Maintance Practices

Auxiliary Lecture Book

Elektrik makinaları ders notları Derleyen: Dr. Öğr. Üyesi Yusuf ER

UBO4121 Mechanical Maintenance Practices-I (0-4-2) 5 ECTS

Introduction to Transmission Systems, Inspection and Backlash Control of Gears, Belt, Pulley, Chain Systems, Screw Jacks and Lever Devices, Push-Pull Rod and Bowden Systems, Testing and Adjustment of Control Cables, Introduction to Sheet Metal Working, Bending and Forming in Sheet Metal Working, Composite Material Processing, Environmental Effects and Inspection in Composites, Welding and Coating Techniques, Bonding Methods and Controls, Construction Controls after Unusual Situations, Review of Implementation Projects.

Course Book: TTS Modul 7 Notes

UBO4122 Mechanical Maintenance Practices-II (0-4-2) 5 AKTS

Introduction to Transmission Systems, Inspection and Backlash Control of Gears, Belt, Pulley, Chain Systems, Screw Jacks and Lever Devices, Push-Pull Rod and Bowden Systems, Testing and Adjustment of Control Cables, Introduction to Sheet Metal Working, Bending and Forming in Sheet Metal Working, Composite Material Processing, Environmental Effects and Inspection in Composites, Welding and Coating Techniques, Bonding Methods and Controls, Construction Controls after Unusual Situations, Review of Implementation Projects.

Course Book: TTS Modul 7 Notes

UBO4123 Gas Turbine Engine Applications-I (0-4-2) 5 AKTS

15.11 Fuel Systems, Operation of engine control and fuel measurement systems including electronic engine control (FADEC); System layout and components, Start/Start and Ignition Systems, Operation of engine start system and components, Maintenance safety requirements, Ignition systems and components; 15.14 Engine Indicator Systems,

Exhaust Gas Temperature/Turbine Temperature between Stages; Engine Thrust Indicator: Engine Pressure Ratio, engine turbine exhaust pressure or jet (exhaust) pipe pressure systems; Engine Thrust Indicator: Engine Pressure Ratio, engine turbine discharge pressure or jet (exhaust) pipe pressure systems; Oil pressure and temperature; Fuel pressure and current; Engine speed; Vibration measurement and indicator; Torque; Power.

Textbook:

- TTS INEGRTED TRAINING SYSTEM Module 15 Licance Category B1 Gas Turbine Engine.

Supplementary Textbooks:

- Gaz Türbinli Motor Uygulamaları Ders Notları Derleyen: Dr. Öğr. Üyesi Burak TANYERİ

UBO4124 Gas Turbine Engine Applications-II (0-4-2) 5 AKTS

15.11 Fuel Systems, Operation of engine control and fuel measurement systems including electronic engine control (FADEC); System layout and components, Start/Start and Ignition Systems, Operation of engine start system and components, Maintenance safety requirements, Ignition systems and components; 15.14 Engine Indicator Systems, Exhaust Gas Temperature/Turbine Temperature between Stages; Engine Thrust Indicator: Engine Pressure Ratio, engine turbine exhaust pressure or jet (exhaust) pipe pressure systems; Engine Thrust Indicator: Engine Pressure Ratio, engine turbine discharge pressure or jet (exhaust) pipe pressure systems; Oil pressure and temperature; Fuel pressure and current; Engine speed; Vibration measurement and indicator; Torque; Power.

Textbook:

- TTS INEGRTED TRAINING SYSTEM Module 15 Licance Category B1 Gas Turbine Engine.

Supplementary Textbooks:

- Gaz Türbinli Motor Uygulamaları Ders Notları Derleyen: Dr. Öğr. Üyesi Burak TANYERİ

UBO4125 Electrical Maintenance Applications-I (0-4-2) 5 AKTS

Avionics General Test Equipment, Electrical Installation Internal Connection System (EWIS), Soldering methods, control of soldered connections, Unusual Events.

Textbook:

- TTS INEGRTED TRAINING SYSTEM Module 7 Licance Category B1 Maintance Practices.

Supplementary Textbooks:

- Elektrik Bakım Uygulamaları ders notları, Derleyen: Dr. Öğr.Üyesi Ömer Osman DURSUN

UBO4126 Electrical Maintenance Applications-II (0-4-2) 5 AKTS

Avionics General Test Equipment, Electrical Installation Internal Connection System (EWIS), Soldering methods, control of soldered connections, Unusual Events.

Textbook:

- TTS INTEGRATED TRAINING SYSTEM Module 7 Licence Category B1 Maintenance Practices.

Supplementary Textbooks:

- Elektrik Bakım Uygulamaları ders notları, Derleyen: Dr. Öğr.Üyesi Ömer Osman DURSUN