

SUBJECT DESCRIPTION

Subject name	ELECTRONICS AND ELECTROTECHNICS
Subject code	RG1101
No. of semester	1
Credit points	2
Weekly contact lessons (theoretical+practical)	1+1
Requirement	Practical grade
Precondition (subject code)	-
Name and title of the subject owner	Dr. Ormos László college professor
Subject owner department code	KI

1. Subject objectives

Students should know the basics of electrotechnics, electrical circuits of aircraft avionics, direct and alternate current and circuit elements.

2. Subject programme

Dielectric flux, potential, current. Condensator. Magnetic flux, flux distribution, conductivity, self-inductive coil. Principle of direct current. Power sources. Principle of alternate current, 3 phases current and characteristics. Direct current motors and characteristics. Alternate current motors and characteristics. Power sources: batteries, generators, converters. Principle and devices of current transformation. Direct and alternate current power sources on aircraft. Wires, couplings, switches. Energy transmitting system of aircrafts.

Consumers: motors, transformers, servo systems, indicator lights.

Operation, types, application of semi-conductive devices, analog and digital devices, their characteristics. Logical circuits, symbols, computer technic. Analog circuits, amplifiers, electronic devices. Radio technic, wave spreading, modulation, converters, antennas.

Locator basic knowledge.

3. Requirements during semester

3 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points:

3 tests 90 points

Activity during lessons 10 points

5. Method of evaluation

Practical grade according to the Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- FEJES: Aircraft instruments and equipments (college lecture notes). Nyíregyháza, 1988.
- Radio Aids. Nordic Aviation Resources, 2000.
- Tatos: Aircraft electricity and avionics knowledge MK. 1978.
- Electrics, Electronics, Oxford Aviation Training, 2002

SUBJECT DESCRIPTION

Subject name	PRINCIPLES OF FLIGHT
Subject code	RG1102
No. of semester	1
Credit points	5
Weekly contact lessons (theoretical+practical)	4+2
Requirement	colloquium
Precondition (subject code)	-
Name and title of the subject owner	Dr. Szilágyi Dénes college associate professor
Subject owner department code	KI

1. Subject objectives

Students should know the basics of subsonic, transonic and supersonic flow and flight characteristics, aircraft stability and factors affecting controllability, aircraft loads and and aircraft flight limitations.

2. Subject programme

Subsonic aerodynamics: equation of continuity, Bernoulli-equation, impulse-principle, airfoil and wing geometrical characteristics, air forces rising on the wing: lift, drag. Aircraft drag and polaris. Stall, spin. High lift devices of the wing. Icing affects on flight. Propeller aerodinamics. Penaud-diagram. Aircraft performance calculation: level flight, climbing, descent, range, take-off and landing distance. Transonic and supersonic flow characteristic, Mach number dependent changes on characteristics. Methodes to extend M critic. Supercritical profile. Aircraft longitudinal stability and affecting factors. Longitudinal movement controlability characteristics: static and dynamic controlforce and control-column position gradient. Trimming. Aircraft directional stability. Factors affecting its amount. Aircraft lateral stability. Dynamic lateral stability: diving-spiral, dutch-rol. Aircraft flight controlling. Principles of control surfaces, hinge moment, control-force reducing aerodynamic and booster methodes. Aircraft loads. Determination of the overload factor in turning, levelling up and in case of vertical gust. Load envelope. Specific speeds and restrictions. Aeroelastic fenomena, flutter.

3. Requirements during semester: 3 tests, 1 application-oriented task

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

3 tests	36 points
1 application-oriented task	14 points
Colloquium exam	50 points

5. Method of evaluation: Performance during semester + colloquium exam

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

SZELESTEY GY.: Aeromechanic I. GATE NFK. 1997.

– Principles of Flight. Nordic Aviation Resources, 2000.

– Principles of Flight. Oxford Aviation Training Center, 2002.

– RÁCZ E.: Aircrafts. Műegyetemi Kiadó, 2001.

– AAGE ROED: Aerodynamics of flight safety. LRI. 1985.

SUBJECT DESCRIPTION

Subject name	AVIATION ENGLISH I
Subject code	RG1103
No. of semester	1
Credit points	2
Weekly contact lessons (theoretical+practical)	0+2
Requirement	Practical grade
Precondition (subject code)	-
Name and title of the subject owner	Takács Gábor technical instructor
Subject owner department code	KI

1. Subject objectives

Students should know basic English phrases and expressions used in aviation. They should understand English technical texts, standards, regulations and questions. They should be able to translate them and answer the questions in English. They should be able to communicate with technical staff in all fields of aviation. They should present their skills and knowledge of aviation engineering in English.

2. Subject programme

Aircraft General Knowledge; airframe and systems, fuselage, cockpit and cabin, wing, stabilising surfaces, landing gear, flight controls, primary and secondary controls, hydraulic systems, pneumatic systems, pressurisation, de-ice systems, fuel system, tanks, fuel feed, fuel dumping system. Meteorology, the atmosphere, wind, thermodynamics, clouds and fog, precipitation, airmasses and fronts, pressure systems, climatology, flight hazards, meteorological information.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points:

2 tests 80 points

Activity during lessons: 20 points

5. Method of evaluation

Practical grade according to the Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source

7. Compulsory and recommended sources (lessons 3-5)

- Aircraft pilot English technical anthology. LRI ROK, 1990.
- English for aircraft 1 documentation handbook. Philip Shawcross, 1992.
- Jeppesen
- Flight International Magazine
- ICAO Annexes
- Flight Manuals
- Operational Manuals
- Quick Reference Handbook

SUBJECT DESCRIPTION

Subject name	AVIATION ENGLISH II
Subject code	RG1201
No. of semester	2
Credit points	2
Weekly contact lessons (theoretical+practical)	0+2
Requirement	Practical grade
Precondition (subject code)	RG1103
Name and title of the subject owner	Takács Gábor technical instructor
Subject owner department code	KI

1. Subject objectives

Students should know basic English phrases and expressions used in aviation. They should understand English technical texts, standards, regulations and questions. They should be able to translate them and answer the questions in English. They should be able to communicate with technical staff in all fields of aviation. They should present their skills and knowledge of aviation engineering in English.

2. Subject programme

Principles of flight, subsonic aerodynamics, laws and definitions, airflow, wing shape, drag, lift, stall, stall warning, leading edge devices, stability, control surfaces, spiral dive, dutch roll, control, limitations, propellers, flight mechanics.

Powerplant; piston engines, lubrication system, air cooling, ignition, engine fuel supply, engine performance, power augmentation devices, fuel, mixture, propeller, engine handling and manipulation, operational criteria, turbine engine, principles of operation, types of construction, engine constructions, compressor, air inlet, turbine, jet pipe; pressure, temperature and airflow in a turbine engine, APU, thrust, powerplant operation and monitoring.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points

2 tests 80 points

Activity during lessons: 20 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source

7. Compulsory and recommended sources (lessons 3-5)

- Aircraft pilot English technical anthology. LRI ROK, 1990.
- English for aircraft 1 documentation handbook. Philip Shawcross, 1992.
- Jeppesen; Flight International Magazine; ICAO Annexes; Flight Manuals
- Operational Manuals
- Quick Reference Handbook

SUBJECT DESCRIPTION

Subject name	AVIATION ENGLISH III
Subject code	RG1301
No. of semester	3
Credit points	2
Weekly contact lessons (theoretical+practical)	0+2
Requirement	Practical grade
Precondition (subject code)	RG1201
Name and title of the subject owner	Takács Gábor technical instructor
Subject owner department code	KI

1. Subject objectives

Students should know basic English phrases and expressions used in aviation. They should understand English technical texts, standards, regulations and questions. They should be able to translate them and answer the questions in English. They should be able to communicate with technical staff in all fields of aviation. They should present their skills and knowledge of aviation engineering in English.

2. Subject programme

Navigation, general navigation, magnetism and compasses, charts, dead reckoning navigation, in-flight navigation, radio navigation, radio aids, basic radar principles. Flight instruments; air data instruments, automatic flight control systems, warning and recording equipments, powerplant and system monitoring instruments. Electric's; direct current, electric circuits, Ohm's law, batteries, magnetism, generators, current distribution, alternating current, 3-phase generators, AC power distribution, transformers, basic electric principles, antennas. Flight performance and planning, mass and balance, loading, centre of gravity, flight planning and flight monitoring, navigation plan, ICAO/ATC flight plan. Human performance and limitations, basic aviation psychology. Operational procedures, JAR-OPS requirements, bird strike risk and avoidance, fire/smoke, decompression of pressurised cabin, windshear, microburst, wake turbulence, emergency landing, transport of dangerous goods.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points

2 tests	80 points
Activity during lessons	20 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source

7. Compulsory and recommended sources (lessons 3-5)

- Aircraft pilot English technical anthology. LRI ROK, 1990.
- English for aircraft 1 documentation handbook. Philip Shawcross, 1992.
- Jeppesen; Flight International Magazine; ICAO Annexes
- Flight Manuals
- Operational Manuals

SUBJECT DESCRIPTION

Subject name	PPL THEORETICAL KNOWLEDGE
Subject code	RG1104
No. of semester	1
Credit points	4
Weekly contact lessons (theoretical+practical)	4+1
Requirement	Practical grade
Precondition (subject code)	-
Name and title of the subject owner	Dr. Ormos László college professor
Subject owner department code	KI

1. Subject objectives

Students should acquire the necessary knowledge to get a private pilot licence (PPL), as well as a prior knowledge for further, more specified education.

2. Subject programme

Aircraft-technical knowledges: main parts design of the aircraft structure, wing, fuselage, flight control surfaces. Design of primary and secondary flight control surfaces. Design and operation of landing gears. Shock-absorbing and braking. Structure and parts of fuel system. Engine mountings design. Aircraft engine main parts: crank assembly, valve control, mixture control, ignition system, starter system, oil system, cooling system. Aircraft instruments and avionics: aircraft direct and alternate current systems. Battery, generator, inverter, consumers. Aircraft monitoring, navigation and engine monitoring instruments.

Aircraft type familiarisation: main technical data of aircraft. Structure of fuselage. Flight control system, landing gear, fuel-system, cockpit and operation. Cockpit instruments, controlling handles function and operation. Main parameters of the engine. Structure of the engine, operation of sub-systems.

Basis of English radiotelephony: definitions of radiotelephony, basic rules of air-ground communication, transmission technique, ICAO ABC code, commencing and maintaining of communication. Callsigns and abbreviations. Radio check. Rules of read-back. Meteorological advisory, other informations. VFR radiotelephony.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

2 tests (2x50): 100 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- HENNEL S.: Aircraft structure and system knowledge I-II. Műszaki Könyvkiadó, 1979., 1980.
- VASS B.: Aircraft engine-structure theory II. Műszaki Könyvkiadó, 1978.
- MELEGH M.: Aircraft instrumental and avionics. MK, 1978.
- Technical description of the trainer aircraft.

SUBJECT DESCRIPTION

Subject name	AIR LAW
Subject code	RG1105
No. of semester	1
Credit points	3
Weekly contact lessons (theoretical+practical)	3+1
Requirement	colloquium
Precondition (subject code)	-
Name and title of the subject owner	Dr. Moys Péter lawyer of transportation
Subject owner department code	KI

1. Subject objectives

The purpose of the subject is to introduce into the Hungarian and international civil aviation organisations and regulations through historical description of air law. It is an important task to get acquainted with Annexes, and the related Aviation Regulations (Annex 2).

2. Subject programme

International air law. Chicago convention. Other International conventions (Warsava, Tokyo, Hague, Montreal). International Civil Aviation Organisation (ICAO). European aviation organisations (ECAC; EUROCONTROL). Joint Aviation Authority (JAA). Joint Aviation Requirements (JAR). Hungarian aviation organisation and air law. Civil Aviation Authority structure and organisation. System of information sharing, sources, Annexes. Personal conformity. Annex, and 5/2001. KöViM regulation. Aircraft airworthiness (Annex 8), registration numbers (Annex 7). ATC services (Annex 11, doc 4444). Flight rules (Annex 2), VFR and IFR flight general rules and requirements. Airports (Annex 14). Airport visit. Airport design visual aids. Emergency and other services. Standards (Annex 9). Search and rescue (Annex 12). Flight safety. Investigation of flight incidences (Annex 13).

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points:

2 tests 50 points

Colloquium exam 50 points

5. Method of evaluation: Performance during semester + colloquium exam.

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance.

7. Compulsory and recommended sources (lessons 3-5)

– MOYS P.: Air law. HungaroControl ROK, 2001.

– Basic principle of organisation and activity of International Civil Aviation Organisation (ICAO). KPM Légügyi Főosztály kiadvány, 1973.

– Annexes

– AIR LAW, NAR 2000.

– AIR LAW, Oxford Aviation Training, 2002.

SUBJECT DESCRIPTION

Subject name	FLIGHT METEOROLOGY
Subject code	RG1106
No. of semester	1
Credit points	4
Weekly contact lessons (theoretical+practical)	4+1
Requirement	colloquium
Precondition (subject code)	-
Name and title of the subject owner	Fejesné Sándor Valéria meteorologist
Subject owner department code	KI

1. Subject objectives

Students should know the basic characteristics of atmosphere, different weather processes, meteorological services, the impacts of atmospheric phenomena on flight and localisation of dangerous meteorological phenomena

2. Subject programme

Contents and extension of the air. Ray of Sun, temperature-distribution. Atmospheric pressure. Density change by the altitude. International Standard Atmosphere. Altitude measurement. Rise and measurement of the wind. Turbulence. Wind changing by the altitude. Local winds. Stationary waves. Water steam in atmosphere. Clouds and fog. Precipitation types, icing. Air masses and fronts. Meteorological forecasts. Pressure-distribution principles. Cyclon, anti-cyclon.

Climatology. Planetary synoptic scale weather progresses- Basic of tropical meteorology: monsoon, tropical cyclon. Weather phenomena dangerous for flight: icing, turbulence, windshear, thunderstorm, low and high level inversion, mountain waves. Phenomena causing low visibility. Meteorological information: observation, weather charts. Information for flight: flight meteorology codes and transmissions.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

test I	25 points
test II	25 points
colloquium exam	50 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- Meteorology. Oxford Training Center, 2002.
- SÁNDOR V.–WANTUCH F.: Flight-meteorology. OMSZ, 2004.
- Meteorology. Nordic Aviation Resource, 2000.
- Aviation Weather. Jeppesen, 1997.

SUBJECT DESCRIPTION

Subject name	FLIGHT NAVIGATION I
Subject code	RG1107
No. of semester	1
Credit points	5
Weekly contact lessons (theoretical+practical)	3+3
Requirement	colloquium
Precondition (subject code)	-
Name and title of the subject owner	Dr. Szilágyi Dénes college associate professor
Subject owner department code	KI

1. Subject objectives

Students should know the basics of air navigation, geographical expressions, air navigation principles under VFR condition and air navigation procedures under IFR condition.

2. Subject programme

Definition of air navigation. Basic definitions and function of geography. Basics of time and calendar. Solar-system, Earth, time and time calculations, directions, distances, magnetism nad compasses, maps. Flight headings, flight speed. Wind affect on flight. Flight altitude. Flight maps and charts. Navigation in VMC. Assignment of significant navigation points at day and at night. Procedure in case the loss of navigation. Base definitions of navigation. Development of navigation plan, filling of flight plan, onboard logbook.

3. Requirements during semester

2 tests, 1 application-oriented task

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points

2 tests:	40 points
1 application-oriented task	10 points
Colloquium exam	50 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations.

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- GÁLIK L.: Air navigation I-II. LRI-Kiadvány, 1987.
- GÁLIK L.: Wide-range and automated navigation. LRI-ROK
- TÓTH J.: Air navigation (II. kiadás). LRI-ROK, 1991.
- Navigation I. Oxford Aviation Training, 2002.
- Navigation Nordic Aviation Resources, 2000.

SUBJECT DESCRIPTION

Subject name	FLIGHT NAVIGATION II
Subject code	RG1202
No. of semester	2
Credit points	5
Weekly contact lessons (theoretical+practical)	3+3
Requirement	colloquium
Precondition (subject code)	RG1107
Name and title of the subject owner	Dr. Szilágyi Dénes college associate professor
Subject owner department code	KI

1. Subject objectives

Students should know the basics of air navigation (VFR navigation) and geography, as well as air navigation by IFR procedures.

2. Subject programme

Theory: Basic concepts and fields of radio navigation. Procedures based on direction measurement: using NDB/ADF system. Using VOR/DME system. ILS and MLS systems. Instrumental approach types, segments, operating minimums. Using of systems based on radar-theory. Omega, Loran, Decca systems. Satellite navigation system. FMCS system.

Practices: Radio navigation instruments introduction on simulator. Computing QDM. Navigation procedures appliance in simulator. ILS, VOR system introduction and practice on FS4EU and ATP simulators.

3. Requirements during semester

2 tests, 1 application-oriented task

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points

2 tests	40 points
1 application-oriented task	10 points
Colloquium exam	50 points

5. Method of evaluation

Semester performance + exam performance

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- GÁLIK L.: Flight navigation I-II. LRI-Publication, 1987.
- GÁLIK L.: Long range and automatized navigation. LRI-ROK 1991
- Navigation II. Oxford Aviation Training, 2002.
- Navigation Nordic Aviation Resources, 2000.

SUBJECT DESCRIPTION

Subject name	FLIGHT TRAINING I.
Subject code	RG1108
No. of semester	1
Credit points	4
Semester contact lessons (theoretical+practical)	0+80
Requirement	Practical grade
Precondition (subject code)	-
Name and title of the subject owner	Baku László technical instructor
Subject owner department code	KI

1. Subject objectives

Based on the theoretical trainings, students should attend practical flight training on CPL/IR level and MCC by simulator training.

2. Subject programme

Type knowledge of training aircraft (Z-142). PPL flight training I. part: ground preparation. Climb, descent, and turn performing. Performing and planning of landing, ground preparation. Flight in training box. Preparing for flight alone. Flight alone in visual circuit. PPL flight training II. Part: VFR flights. Landing in other airport. Basic instrument flight. Level flight, climb, descent, turn performing. Recovery from emergency situations (e.g.: spin) CPL flight trainings I-II.: airspace and cross-country flights, VOR, ADF use. Night VFR flights. Aerobetic flights. Low level flights and low level cross-country flight skill improvement.

3. Requirements during semester

Check flights. Requirements are defined on the basis of practical adequacy at the end of every phase of training, which requires the safety compliance of given flight task. Any inadequacy on this area – after appropriate repeated checks – makes an end of practical training on the basis of decision of the training organisation. Adequacy could be affected by the health of trainee as well as his/her ability and preparedness. CAA theoretical and practical examinations are also among the requirements of this course.

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Since the requirements are not fixed to a date (exam period), the semester validity and the grade depend on the decision of the flight training organisation manager.

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source.

7. Compulsory and recommended sources (lessons 3-5)

- Type descriptions, Flight Manuals
- National Regulations
- Charts
- AIP
- Jeppesen Manual

SUBJECT DESCRIPTION

Subject name	FLIGHT TRAINING II
Subject code	RG1203
No. of semester	2
Credit points	1
Semester contact lessons (theoretical+practical)	0+40
Requirement	Practical grade
Precondition (subject code)	RG1108
Name and title of the subject owner	Baku László technical instructor
Subject owner department code	KI

1. Subject objectives

Based on the theoretical trainings, students should fulfil practical flight training on CPL/IR level and MCC by simulator training.

2. Subject programme

CPL flight training III.: cross-country flights. Flights to another airport. Flights to international airport. CPL flight training IV.: Simulator training (IFR flight). Cockpit training. Flight procedures training. Cross-country flight. Emergency situation simulation.

3. Requirements during semester

Check flights. Requirements are defined on the basis of practical adequacy at the end of every phase of training, which requires the safety compliance of given flight task. Any inadequacy on this area – after appropriate repeated checks – makes an end of practical training on the basis of decision of the training organisation. Adequacy could be affected by the health of trainee as well as his/her ability and preparedness. CAA theoretical and practical examinations are also among the requirements of this course.

1. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Since the requirements are not fixed to a date (exam period), the semester validity and the grade depend on the decision of the flight training organisation manager.

5. Method of evaluation:

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source

7. Compulsory and recommended sources (lessons 3-5)

- Type descriptions, Flight Manuals
- National Regulations
- Charts
- AIP
- Jeppesen Manual

SUBJECT DESCRIPTION

Subject name	FLIGHT TRAINING III
Subject code	RG1302
No. of semester	3.
Credit points	5
Semester contact lessons (theoretical+practical)	0+80
Requirement	Practical grade
Precondition (subject code)	RG1203
Name and title of the subject owner	Baku László technical instructor
Subject owner department code	KI

1. Subject objectives

Based on the theoretical trainings, students should fulfil practical flight training on CPL/IR level and MCC by simulator training.

2. Subject programme

IFR flight trainings. Cross-country flights. Night flights. Preparation trainings to CPL/IR licence exam. IFR flights in simulator and inifr flight. Bight flight training. Multi-crew-coopersation training.

3. Requirements during semester

Check flights. Requirements are defined on the basis of practical adequacy at the end of every phase of training, which requires the safety compliance of given flight task. Any inadequacy on this area – after appropriate repeated checks – makes an end of practical training on the basis of decision of the training organisation. Adequacy could be affected by the health of trainee as well as his/her ability and preparedness. CAA theoretical and practical examinations are also among the requirements of this course.

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Since the requirements are not fixed to a date (exam paeriod), the semester validity and the grade depend on the decision of the flight training organisation manager.

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source

7. Compulsory and recommended sources (lessons 3-5)

- Type descriptions, Flight Manuals
- National Regulations
- Charts
- AIP
- Jeppesen Manual

SUBJECT DESCRIPTION

Subject name	AIRCRAFT INSTRUMENTS AND ELECTRICAL EQUIPMENTS II
Subject code	RG1204
No. of semester	2
Credit points	4
Weekly contact lessons (theoretical+practical)	2+2
Requirement	colloquium
Precondition (subject code)	RG1109
Name and title of the subject owner	Dr. Ormos László college professor
Subject owner department code	KI

1. Subject objectives

The aim of the subject is to get the students acquainted with aircraft instruments and avionics, operations and functions.

2. Subject programme

Aircraft instrument displays; pressure heads; Air temperature measurement; The airspeed indicator; The pressure altimeter; The vertical speed indicator; The machmeter; Gyroscopes; Directional gyro indicator; The artificial Horizon and vertical gyro unit; The turn and slip indicator; Turn Co-ordinator; remote indicating slaved gyro compass; Inertial navigation system; Laser gyroscopes; Air data computer; The radio altimeter;

Practice: Examination of instrument displays and sender; Examination of gyroscope equipment;

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (mid-semester grade, exam grade)

Semester total points

2 tests 50 points

Colloquium grade 50 points

5. Method of evaluation

Semester performance + colloquium performance

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- FEJES: Aircraft instruments and equipments (college lecture notes). Nyíregyháza, 1988.
- Instrumentation, Oxford Aviation Training, 2002.

SUBJECT DESCRIPTION

Subject name	HUMAN PERFORMANCE AND LIMITATIONS
Subject code	RG1205
No. of semester	1
Credit points	3
Weekly contact lessons (theoretical+practical)	3+1
Requirement	colloquium
Precondition (subject code)	-
Name and title of the subject owner	Dr. Hardicsay Gábor chief medical doctor
Subject owner department code	KI

1. Subject objectives

Flight physiology and health bases introduction. Flight psychology, human performance and limitations introduction.

2. Subject programme

Human performance. Basic definitions. Fundamentals of flight physiology and health. Human and environment. Perception system. Health and hygienic. Basic definitions of flight physiology. Information gathering and processing. Human errors and reliability. Decision making and decision theory. Errors treatment and avoidance in flight. Cockpit operations. Multi crew co-operation. Personality and behaviour. Human patience, stress. Effect of cockpit ergonomics on operations.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

2 tests 50 points

Colloquium grade: 50 points

5. Method of evaluation

Semester performance + colloquium performance

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

– Human Performance and Limitations. Oxford Training Center, 2002.

– Human Performance and Limitations. Nordic Aviation Resource, 2000.

– Aviation-psychology. LRI Department of Flight Control, 1978.

SUBJECT DESCRIPTION

Subject name	FLIGHT PLANNING AND PERFORMANCE I
Subject code	RG1206
No. of semester	2
Credit points	3
Weekly contact lessons (theoretical+practical)	2+1
Requirement	Practical grade
Precondition (subject code)	RG1102
Name and title of the subject owner	Dr. Szilágyi Dénes college associate professor
Subject owner department code	KI

1. Subject objectives

Students should know the load and performance of the aircraft, acquire a skill in calculating performance and CG position, in navigation planning and filling-filing VFR and IFR flight plans.

2. Subject programme

Theory: Aircraft weight components, effect of load changing. Computing centre of gravity. Fixing of cargo. Correction of any deviation. Performance of SEP, MEP and MRJT aircraft: take-off, landing, climb, descent, cruising.

Practices: Weight components and computing centre of gravity. Using of different performance-charts of the Flight Manual for calculating the performance limited mass in the different phases of flight. Determining of the MATOM. Placement of load components on the base of MATOM and other structural limitations.

3. Requirements during semester

2 tests and 1 application-oriented task

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

2 test (2x30) 60 points

1 application-oriented task 40 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

– Flight Performance and Planning 1 OXFORD Aviation Services 2001.

– Mass and balance NAR 2000;

– Performance NAR 2000;

– CAP 696 & 698 BCAA

– ALGÁCS I.: Air transport LRI-ROK 1992

– Aircraft Flight Manuals

– Records: Load sheets, Airway bills.

SUBJECT DESCRIPTION

Subject name	FLIGHT PLANNING AND PERFORMANCE II
Subject code	RG1303
No. of semester	3
Credit points	4
Weekly contact lessons (theoretical+practical)	3+1
Requirement	Practical grade
Precondition (subject code)	RG1206
Name and title of the subject owner	Dr. Szilágyi Dénes college associate professor
Subject owner department code	KI

1. Subject objectives

Students should know the load and performance of the aircraft, acquire a skill in calculating performance and CG position, in navigation planning and filling-filing VFR and IFR flight plans.

2. Subject programme

Theory: Plan of route-flight: navigation plan, fuel computing. ICAO Flight Plan. Use of IFR route-charts. Use of navigational data sources. Planning international routes.

Practices: Practical flight planning: chart preparation, route assigning, performing navigation and fuel plan, signing alternate aerodromes, performing flight navlog, Flight Plan filling.

3. Requirements during semester

2 tests and 1 application-oriented task

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Total semester points

2 ea tests (2x30)	60 points
1 application-oriented task	40 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- Flight Performance and Planning 1 OXFORD Aviation Services 2001.
- Flight Planning NAR 2000;
- JEPPESEN Airway Manuals;
- AIP Hungary
- Flight Manuals
- Records: Flight Plan, Meteorological Messages and Charts, NOTAM-s, SNOWTAM-s.

SUBJECT DESCRIPTION

Subject name	FLIGHT OPERATING PROCEDURES
Subject code	RG1207
No. of semester	2
Credit points	4
Weekly contact lessons (theoretical+practical)	3+1
Requirement	colloquium
Precondition (subject code)	RG1105
Name and title of the subject owner	Dr. Szilágyi Dénes college associate professor
Subject owner department code	KI

1. Subject objectives

Students should know the European aircraft operation requirements (PART-OPS).

2. Subject programme:

Theoretical: According the JAR-FCL concerning chapter the ICAO 6 Annex I-II-III Parts and EU-OPS prescriptions: general requirements, certifications and inspection requirements of operator, performance of aircraft, instruments and equipments requirements, communication and navigation requirements, aircraft maintenance, operation of flight crew and attendants, certifications and documentation, dangerous goods transportation, minimum equipment list, ground de-icing procedures, bird-strike hazard and modes of avoidance, noise-abatement procedures. Special operating procedures, emergencies: fire and smoke in aircraft, de-compression of cabin, clear air turbulence, wake-turbulence, unlawful interference, emergency and non scheduled landings, fuel damping, effects of runway contamination.

Practises: Introduce of different shipment documents and forms, aircraft lease contracts, aircraft operator certification. EU-OPS audit record, flight operation manual of different aircraft types, company SOP, navlogs, minimum equipment lists, meteorological messages, and different quality insurance documents, line maintenance checking and recording.

3. Requirements during semester

2 tests and 1 application-oriented task

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

2 tests 40 points

1 application-oriented task 10 points

colloquium grade: 50 points

5. Method of evaluation: Semester performance + colloquium performance

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

– OPS 1: 859/2008 EC Regulation

– ICAO 6. Annex

– MOYS P.: International Air Law. 2006.

– Flight Manuals

– Company Operation Manuals

– OPERATIONAL PROCEDURES, NAR2000 and Oxford Training Center, 2002.

SUBJECT DESCRIPTION

Subject name	ENGLISH RADIOTELEPHONY
Subject code	RG1208
No. of semester	2
Credit points	3
Weekly contact lessons (theoretical+practical)	0+4
Requirement	Practical grade
Precondition (subject code)	RG1104
Name and title of the subject owner	Takács Gábor technical instructor
Subject owner department code	KI

1. Subject objectives

Students should get experience in Hungarian and English radiotelephony and know the rules of communication, phrases and expressions.

2. Subject programme

VFR and IFR radiotelephony. Receiving and understanding ATIS, VOLMET broadcasts. Principle of URH wave spreading and frequency dividing. General controlling orders. Radar vectoring. Approach. Route control. Position reporting. GND and TWR communication. Departure and arrival procedures. ATC clearances. Radar control and transmission. Flight information service. Emergency and urgency transmissions. Procedures in case of radio failure.

3. Requirements during semester

2 tests and an exam.

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Semester total points

2 tests (2x40)	80 points
Exam	20 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- English Radiocommunication Phraseology (LRI ROK Szalontai Andrea);
- Manual of Radiotelephony (ICAO);
- Communication, Oxford Training Center, 2002.

SUBJECT DESCRIPTION

Subject name	AIRFRAME STRUCTURES AND SYSTEMS
Subject code	RG1209
No. of semester	2
Credit points	4
Weekly contact lessons (theoretical+practical)	3+1
Requirement	colloquium
Precondition (subject code)	RG1102
Name and title of the subject owner	Dr. Szilágyi Dénes college associate professor
Subject owner department code	KI

1. Subject objectives

Students should know the fuselage and system structures, functions and operations – including airliner aircrafts. By acquiring this knowledge students should be able to study the type-rated aircraft manuals.

2. Subject programme

Main parts and function of aircraft structures. Fuselage, wing, control surfaces structure. Cockpit and cabin structure. Landing gear types and functions. Shock absorbers: tyre, shockstrut operation, structure. Aircraft brakes. Retractable landing gear operation. Flight control operation and structure. Hydraulic system operation and function. Applied hydraulic fluids. pneumatic system, air conditioning system, pressurisation system, cabin-altitude system, de-icing system.

Jet-engine aircraft systems: air condition system, de-icing system. Fuel-system, fuel tank desing. Fuel feeding. Fuel dumping. Fuel system check. Emergency devices: doors and emergency exits, smoke detector, fire detector. Fire extinguisher system. Oxygen system.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Total semester points

2 tests 50 points

Colloquium exam 50 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- SZELESTEY GY.: Aircraft Structures. MGF, 1995.
- Airframes and Systems. Oxford Aviation Training, 2002.
- Airframes and Systems. Nordic Aviation Resources, 2000.
- VÖRÖS G.: Aircraft Structures and Systems I. LRI ROK, 1995.

SUBJECT DESCRIPTION

Subject name	AIRCRAFT ENGINES
Subject code	RG1210
No. of semester	2
Credit points	3
Weekly contact lessons (theoretical+practical)	3+1
Requirement	colloquium
Precondition (subject code)	RG1104
Name and title of the subject owner	Szegedi Attila technical instructor
Subject owner department code	JG

1. Subject objectives

The aim is to introduce students into the piston engines and jet engines operation principles as well as into their structures and parts functions.

2. Subject programme

Introduction of piston-engines. Engine performance. Lubrication system. Cooling system. Controlling, ignition. Charging engines. Aircraft-engine fuel, fuel system. Mixture performing. Structure of propeller. Engine maintenance. Operating limitations. Types and operation of jet engines. Thrust. Contents of engine inlet, compressor, combustion chamber, turbine, exhaust nozzle. Condition-characteristic changing along the engine in axial direction. Thrust-reverser. Performance and thrust increment. Bleed-air. Ignition-system. Starter system, failures of start. Jet fuels. Fuel-systems. Lubrication system. Operation and monitoring of engine. Auxiliary Power Unit (APU)

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Total semester points:

2 tests	50 points
Colloquium exam	50 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Literature, Lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- SZABÓ GY.: Aircraft Engines I-II. (college lecture notes), MGF, 1985., 1987.
- Powerplant, Oxford Aviation Training, 2002.

SUBJECT DESCRIPTION

Subject name	MULTY CREW COOPERATION
Subject code	RG1304
No. of semester	3
Credit points	2
Weekly contact lessons (theoretical+practical)	1+1
Requirement	Practical grade
Precondition (subject code)	RG1205
Name and title of the subject owner	Lezsovits Gábor type rating instructor
Subject owner department code	KI

1. Subject objectives

Students should get acquainted with multi-pilot aircraft cockpit co-operation and task sharing between the captain and first officer, the main rule related tasks and co-operation methods.

2. Subject programme

Human errors. Reliability of human behaviour. Principles and modelling of human errors. Decision making and decision making processes. Avoiding and managing errors: cockpit management. Conscious safety. Co-operation of multi-pilot aircraft crew members. Tasks and work-sharing between captain and first officer. Communication on board of aircraft.

3. Requirements during semester

2 tests

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Total semester points

2 tests 2 x 50 points = 100 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

– Human factors and limitations. Oxford Aviation Training, 2002.

SUBJECT DESCRIPTION

Subject name	RADIO AND RADAR TECHNICS
Subject code	RG1305
No. of semester	3
Credit points	2
Weekly contact lessons (theoretical+practical)	1+1
Requirement	Practical grade
Precondition (subject code)	RG1101
Name and title of the subject owner	Dr. Ormos László college professor
Subject owner department code	KI

1. Subject objectives

Students should know the basics of radio-communication and the general circuits of radio equipments and all avionics including aviation ground sited navigation transmitters.

2. Subject programme

Radio basic principle. Electromagnetic waves spreadin characteristics. Frequencies. Amplifier and mixing devices. Modulation-demodulation processes. Oscillators, antennas. Polariastion. Other radio circuits. Aircraft radio equipments: VHF communication radio, ADF, VOR, radio-altimeter, DME, UHF radio. ILS. Emergency radio devides, GPS system. TCAS.

3. Requirements during semester

3 tests

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Total semester points

3 tests	90 points
Activity during lessons	10 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

- FEJES: Aircraft instruments and equipments (college lecture notes). Nyíregyháza, 1988.
- Electrics-Electronics: Oxford Aviation Training, 2002.
- Radio Aids. Nordic Aviation Resources, 2000.

SUBJECT DESCRIPTION

Subject name	AIRCRAFT ROBOT TECHNICS
Subject code	RG1306
No. of semester	3
Credit points	2
Weekly contact lessons (theoretical+practical)	1+1
Requirement	Practical grade
Precondition (subject code)	RG1101
Name and title of the subject owner	Dr. Ormos László college professor
Subject owner department code	KI

1. Subject objectives

Students should know the aircraft – including airliner aircrafts – automatised flight control system structure and operation. They should know the auto-pilot mathematics modell, the sub-system equipments structure and operation.

2. Subject programme

Robot technic terminologies. Automatic devices, manipulators. Robot communication system: link between equipments and flight control systems. Auto pilot programming and handling. Autopilot as a special robot. Autopilot rule in automated onboard systems. Different levels of auto pilots. Flight-leg programming and automatic landing procedures.

3. Requirements during semester

3 tests

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Total semester points

3 tests 90 points

Activity during lessons 10 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Technical reference source, lecture notes, training guidance

7. Compulsory and recommended sources (lessons 3-5)

– Instrumentation: Oxford Aviation Training, 2002.

– Instrumentation Nordic Aviation Resources, 2000.

SUBJECT DESCRIPTION

Subject name	FINAL THESIS
Subject code	RG1307
No. of semester	3
Credit points	10
Weekly contact lessons (theoretical+practical)	0+1
Requirement	Practical grade
Precondition (subject code)	-
Name and title of the subject owner	Dr. Ormos László college professor
Subject owner department code	KI

1. Subject objectives

Choosing a title and outline of the thesis. Reference overview. Experimental plan. Experiments, measurements preparation and execution. Presentation and application of the knowledge acquired within the framework of a complex thesis that will be defended at a final examination of the student.

2. Subject programme

Participation in consultation sessions. Outline sketch, reference representation. Measurement results presentation, analysis and alignment. Experimental results processing, evaluation and alignment. Conclusions, suggestions. Compilation of the thesis. Creation of bibliography and annexes.

3. Requirements during semester

Conclusions and recommendations formulated. Compilation and presentation of the final thesis. Performing the necessary corrections.

4. Evaluation of the acquired knowledge (medi-semester grade, exam grade)

Practical grade max. 100 points

5. Method of evaluation

Practical grade according to Study and Exam Regulations

6. Available support references for the acquisition of knowledge, skills and competences

Notices, books, publications, electronic publications for reference source processing

7. Compulsory and recommended sources (lessons 3-5)

- Syllabus for edition of Final Thesis