



**TECHNOLOGICAL EDUCATION
INSTITUTION (T.E.I.) OF CHALKIDA**

ECTS GUIDE

**FOR
THE DEPARTMENT OF**

AIRCRAFT TECHNOLOGY

ACADEMIC YEAR 2008-2009

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1. General Information

The Department of Aircraft Technology aims in promoting and transferring scientific and technological knowledge in the area of Aircraft Technology through teaching and applied research in order to provide the students with the necessary scientific and technological knowledge, capacity and skills essential for an Aircraft Engineer. To accomplish this, the scientific and teaching staff of the department uses modern teaching methods and technology, monitors the scientific and technological progress in order to develop new courses and improve the existing ones, develops ties with higher education institutions at a national and international level and works closely with companies and research institutes.

The curriculum covers a wide range of courses and topics, such as the Airframe and Powerplant Systems, the Electrical systems and the Avionics and Instruments of Aircraft. Special emphasis is placed in the laboratory training and hands on experience of our students. Upon completion of their studies, our students can be employed in positions involving the maintenance, inspection, checking, testing, repair, modification, assembly and manufacturing of major Airframe and Aircraft Propulsion Systems, maintenance, inspection, checking, testing, repair, modification, assembly, design, development, manufacturing and control of main Electrical, Electronic, Information, Control and Communications components and systems of Aircraft, the design, development, production and modification of products, procedures and services related to the above mentioned areas and applied research and development.

2. Degree

The degree conferred upon completion of the curriculum studies is equivalent to a Bachelor of Science (level 5A according to the UNESCO's ISCED classification system).

3. Duration and Structure of Studies

The duration of studies is eight semesters. In the first seven semesters, obligatory and elective courses in lecture form are offered in the above areas supported by laboratory and Applied Exercises sessions. The students are required to attend the lectures and the laboratory sessions, work on individual or team projects and present their results in oral and written form. In the final semesters, the students are required to complete their senior project while in the last semester they must do their practical training with a company.

The senior project, mandatory for the completion of one's studies, is based on a topic selected by the student from a list of topics offered by the teaching staff. It gives the student the opportunity to focus on a topic of their interest, to apply the knowledge and skills acquired during their studies, to participate in medium and large scale experiments, to become familiar with bibliographical research techniques, and apply their technical writing skills.

The practical training with a company, supervised by a member of the teaching staff, is also mandatory for the completion of studies. It gives the students the opportunity to broaden their knowledge acquiring hands on experience in real conditions, to familiarize themselves with labour laws and workplace safety procedures and to obtain information necessary for the completion of their senior project.

The Course Syllabus involves Obligatory (O), Obligatory Electives (OE) and Electives (E) that can be Theoretical (T), Laboratory (L) or Mixed (M) courses. According to their content they are classified in General Core (GC), Special Core (SC), Specialization (S) and Human Factors and Legislation Course (HFLC) courses.

The syllabus is structured based on the workload required by an average student ranging from 50 to 60 hours per week depending on the semester level. The hours of class attendance range from 25 to 27 per week depending on the semester. Each semester carries 30 ECTS units while the number of ECTS units of a course depends on the workload required by an average student. The General and Special Core as well as the Specialization courses fall under one of the two Sectors of the Department:

The Sector of Airframe and Powerplants Systems and

The Sector of Electrical, Avionics and Instrument of Aircraft

The following tables summarize the structure of the course syllabus:

4. Course Syllabus

1 st Semester: FIRST HALF-YEAR PERIOD									
Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
TA 0101	MATHEMATICS I	O	GCC	3	1	0	4	10	6
TA 0102	PHYSICS	O	GCC	3	1	2	6	12	7
TA 0103	INTRODUCTION TO MATERIALS	O	GCC	2	2	2	6	10	6
TA 0104	COMPUTER FOR ENGINEERS	O	GCC	2	0	2	4	8	5
TA 0105	ENGINEERING DRAWING	O	GCC	0	0	4	4	4	3
TA 0106	ENGINEERING ECONOMICS	O	HFLC	2	0	0	2	6	3
	TOTAL			12	4	10	26	50	30

2 nd Semester: SECOND HALF-YEAR PERIOD									
Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
TA 0201	MATHEMATICS II	O	GCC	3	1	0	4	10	6
TA 0202	FLUID MECHANICS	O	GCC	3	1	2	6	12	7
TA 0203	ENGINEERING MEASUREMENTS	O	GCC	2	0	2	4	8	5
TA 0204	ELECTROTECHNICS	O	GCC	2	2	2	6	10	6
TA 0205	COMPUTER AIDED DESIGN	O	GCC	0	0	4	4	4	3
TA 0206	MANAGEMENT OF MAINTENANCE FACILITIES	O	HFLC	2	0	0	2	6	3
	TOTAL			12	4	10	26	50	30

Important Note:

O=Obligatory course, **SO**=Sector Obligatory course

GCC= General Core Course, **SCC**= Special Core Course, **SC**=Special Course

HFLC= Human Factors and Legislation Course, **H/W** = Hours per Week

3rd Semester: THIRD HALF-YEAR PERIOD									
Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
TA 0301	APPLIED MATHEMATICS	O	GCC	2	2	0	4	8	5
TA 0302	MECHANICS	O	GCC	2	2	2	6	10	6
TA 0303	ELECTRICAL MACHINES	O	SCC	2	0	2	4	8	5
TA 0304	INTRODUCTION TO TELECOMMUNICATIONS	O	SCC	2	2	0	4	8	5
TA 0305	AIR LAW AND REGULATIONS	O	HFLC	2	0	0	2	6	3
Sector of AIRCRAFT STRUCTURES & POWER SYSTEMS									
TA 0306	INTRODUCTION TO ELECTRONICS	SO	SCC	2	2	2	6	10	6
Sector of AVIONICS									
TA 0307	ANALOG ELECTRONICS	SO	SCC	2	2	2	6	10	6
	TOTAL			12	8	6	26	50	30

Notation:

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HFLC= Human Factors and Legislation Course, **H/W** = Hours per Week

4th Semester: FOURTH HALF-YEAR PERIOD

Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
TA 0401	INTRODUCTION TO AUTOMATIC CONTROL	O	SCC	2	2	2	6	10	6
TA 0402	INTRODUCTION TO AERODYNAMICS	O	SCC	2	0	0	2	6	3
TA 0403	TECHNICAL ENGLISH	O	SC	2	0	0	2	6	3
Sector of AIRCRAFT STRUCTURES & POWER SYSTEMS									
TA 0404	AIRCRAFT STRUCTURES	SO	SCC	2	2	2	6	10	6
TA 0405	THERMODYNAMICS	SO	SCC	2	1	2	5	9	6
TA 0406	STRENGTH OF MATERIALS	SO	SCC	2	1	2	5	9	6
Sector of AVIONICS									
TA 0407	DIGITAL ELECTRONICS	SO	SCC	2	2	2	6	10	6
TA 0408	TELECOMMUNICATION SYSTEMS	SO	SCC	2	1	2	5	9	6
TA 0409	ELECTROMAGNETIC WAVES, PROPAGATION AND ANTENNAS	SO	SCC	2	1	2	5	9	6
	TOTAL			12	6	8	26	50	30

Notation:

O=Obligatory course, **SO**=Sector Obligatory course

GCC= General Core Course, **SCC**= Special Core Course, **SC**=Special Course

HFLC= Human Factors and Legislation Course, **H/W** = Hours per Week

Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
TA 0501	FLIGHT MECHANICS	O	SCC	2	2	0	4	8	5
Sector of AIRCRAFT STRUCTURES & POWER SYSTEMS									
TA 0502	AIRCRAFT SYSTEMS	SO	SCC	3	1	2	6	12	7
TA 0503	MACHINE ELEMENTS	SO	SCC	2	2	2	6	10	6
TA 0504	WELDING MECHANICS	SO	SC	3	1	2	6	12	7
TA 0505	PROPULSION MECHANICS	SO	SCC	2	0	2	4	8	5
Sector of AVIONICS									
TA 0506	DIGITAL AUTOMATIC CONTROL	SO	SCC	3	1	2	6	12	7
TA 0507	POWER ELECTRONICS	SO	SCC	2	2	2	6	10	6
TA 0508	TELECOMMUNICATION ELECTRONICS	SO	SC	3	1	2	6	12	7
TA 0509	SENSOR TECHNOLOGIES	SO	SCC	2	0	2	4	8	5
	TOTAL			12	6	8	26	50	30

Notation:

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HFLC= Human Factors and Legislation Course, **H/W** = Hours per Week

6 th Semester: SIXTH HALF-YEAR PERIOD									
Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
Sector of AIRCRAFT STRUCTURES & POWER SYSTEMS									
TA 0601	AIRCRAFT INSTRUMENTS AND NAVIGATION SYSTEMS	SO	SC	2	0	2	4	8	5
TA 0602	PISTON (RECIPROCAL) ENGINES	SO	SC	2	0	2	4	8	5
TA 0603	HELICOPTER AERODYNAMICS	SO	SC	2	0	2	4	8	5
TA 0604	FUELS AND LUBRICANTS	SO	SC	2	0	2	4	8	5
TA 0605	MANUFACTURING PROCESSES OF AIRCRAFT MATERIALS	SO	SC	2	0	2	4	8	5
TA 0606	COMPOSITE MATERIALS	SO	SC	2	2	0	4	8	5
Sector of AVIONICS									
TA 0607	AIRCRAFT ELECTRICAL SYSTEMS	SO	SC	2	0	2	4	8	5
TA 0608	MICROWAVES	SO	SC	2	0	2	4	8	5
TA 0609	AIRCRAFT INSTRUMENTS	SO	SC	2	0	2	4	8	5
TA 0610	MICROPROCESSORS	SO	SC	2	0	2	4	8	5
TA 0611	AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEMS	SO	SC	2	0	2	4	8	5
TA 0612	FLIGHT STABILITY AND AUTOMATIC FLIGHT CONTROL	SO	SC	2	2	0	4	8	5
	TOTAL			12	2	10	24	48	30

Notation:

O=Obligatory course, **SO**=Sector Obligatory course

GCC= General Core Course, **SCC**= Special Core Course, **SC**=Special Course

HFLC= Human Factors and Legislation Course, **H/W** = Hours per Week

7th Semester: SEVENTH HALF-YEAR PERIOD

Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
TA 0701	PROFESSIONAL ETHICS	O	HFLC	2	0	0	2	6	3
Sector of AIRCRAFT STRUCTURES & POWER SYSTEMS									
TA 0702	TURBINE ENGINES	SO	SC	3	1	2	6	12	7
TA 0703	PRINCIPLES OF AIRCRAFT DESIGN	SO	SC	2	1	2	5	9	6
TA 0704	AERODYNAMICS OF AIRCRAFT ENGINES	SO	SC	3	0	3	6	12	7
TA 0705	SPECIAL TOPICS OF FLIGHT MECHANICS	SO	SC	3	0	2	5	11	7
Sector of AVIONICS									
TA 0706	RADARS	SO	SC	3	1	2	6	12	7
TA 0707	AUTOMATIC FLIGHT CONTROL SYSTEMS	SO	SC	2	1	2	5	9	6
TA 0708	FIBER OPTIC COMMUNICATIONS	SO	SC	3	0	3	6	12	7
TA 0709	AVIONICS DATABUSES	SO	SC	3	0	2	5	11	7
	TOTAL			13	2	9	24	50	30

8th Semester: EIGHTH HALF-YEAR PERIOD									
Course Code No.	Course Description	O/SO	Category	Theory (H/W)	Applied Exercises (H/W)	Lab (H/W)	Total (H/W)	Work Load	ECTS Credits
TA 0801	PRACTICE	O	-	0	0	0	0	20	10
TA 0802	GRADUATION PROJECT	O	-	0	0	4	4	30	20
	TOTAL			0	0	0	0	50	30

Notation:

O=Obligatory course, **SO**=Sector Obligatory course

GCC= General Core Course, **SCC**= Special Core Course, **SC**=Special Course

HFLC= Human Factors and Legislation Course, **H/W** = Hours per Week

4.1 Course Description

First Semester

Course Description	MATHEMATICS I		
Typical Semester	1 st		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	3 Theory	1 Applied Exercises	0 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the fundamental principles of linear algebra, of differential and integral calculus and complex numbers • Apply the mathematics principals in order to solve practical problems, that are appears during the maintenance procedure and manufacture of aircraft parts. 		
Syllabus	<p>Determinant. Functions. Sequences. Function limits. Local continuities. Functions monotony Inverse function. Circular or trigonometric functions. Differentiation techniques. Differentials of complex functions. Inverse trigonometric functions. Exponential functions. Logarithmic functions. Functions monotony criteria. Definite integral. Indefinite integral. Generalized integral. Integration techniques. Complex numbers.</p>		
Suggested Readings	<p style="text-align: center;">Ralph, Palmer. Agnew, Analytical Geometry and Calculus with vectors (Calculus), McGraw-Hill, 1962. Applied Linear Algebra, Ben Nobles Prentice Hall, 1969.</p>		

Course Description	PHYSICS		
Typical Semester	1 st		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the fundamental laws of physics. • Apply the principles of the fundamental laws of physics in order to solve practical problems, which appear during the maintenance procedure and manufacture of aircraft parts. 		
Syllabus	<p>System Units - Materials. Fundamental principles of kinematics. Fundamental principles of dynamics. Hydrodynamics. Fundamental principles of heat. Thermodynamics variations of gas. Fundamental principles of waves and acoustics. Fundamental principles of optics. Fundamental principles of electricity. AC and DC power. Fundamental principles of magnetism. Coils.</p>		
Suggested Readings	<p>Halliday-Resnick -Krane: "Physics", John Wiley and Sons, Inc 1992 Berkeley University : "Berkeley Physics course " McGraw Hill 1985</p>		

Course Description	INTRODUCTION TO MATERIALS		
Typical Semester	1st		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the fundamental principles of material science • Apply the principles of material science in order to solve practical problems, which appear during the maintenance procedure and manufacture of aircraft parts. 		
Syllabus	<p>Structure of materials. Chemistry kinematics and thermal chemistry. Mechanical behavior of materials. Alloys and Stable phase diagrams. Iron-Carbon diagram (Fe-FeC₃). Metal hardening methods. Thermal process of steels. Metal corrosion. Metallic non-ferrous materials. Composite materials. Polymer and ceramic materials.</p>		
Suggested Readings	<p>Materials Science & Engineering, W. D. Callister, 2003. Fundamentals of Materials Science & Engineering, W. D. Callister, 2001.</p>		

Course Description	COMPUTER FOR ENGINEERS		
Typical Semester	1 st		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the fundamental principles of the computer operation and management. • Apply the principles of the computer operation and management in order to solve practical problems, which appear during the maintenance procedure and manufacture of aircraft parts 		
Syllabus	<p>Introduction to computer science. Numerical systems. Integer representation in the computer. Analog data. Digital data. Architecture of the computer unit. Boole's algebra. Basic structure of the computer unit. Microprocessor. PC's Input and output units. Auxiliary memory units. Introduction to software. Introduction to programming. Computer networks. Internet. The aircraft computer unit.</p>		
Suggested Readings	<p>Manual Microsoft Word, Microsoft Press. Manual Microsoft Excel, Microsoft Press.</p>		

Course Description	ENGINEERING DRAWING		
Typical Semester	1 st		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	0 Theory	0 Applied Exercises	4 Lab
ECTS Credits	3		
Work load	4		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Read engineering drawings of aircraft parts. • Apply the principles of engineering drawing in order to design simple parts and assemblies of aircraft mechanisms. 		
Syllabus	Fundamental principles of mechanical drawing. International standards. Drawing projection planes. Dimensions. Sections. Threads. Gears. Wedges. Bearings. Assembled mechanisms.		
Suggested Readings	<p>Mechanical Engineering Design, by Charles R. Mischke, Joseph Edward Shigley, Publisher: McGraw-Hill Higher Education Machine Elements In Mechanical Design, Robert L. Mott, Prentice Hall</p>		

Course Description	ENGINEERING ECONOMICS		
Typical Semester	1 st		
Category	Human Factors and Legislation Course (HFLC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	0 Lab
ECTS Credits	6		
Work load	3		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Determine the fundamental principles of financing administration. • Describe the procedure which should be followed in order to construct an engineering economic report 		
Syllabus	<p>The aircraft maintenance unit. The anonym society (structure, agents, functions). The share. Construction and authorship of research – feasibility analysis report of engineering economic study. Marketing aiming the information collection. Nature and work as production factors in aircraft maintenance unit. Indicators and measurement methods of work productivity in aircraft maintenance unit. Capital as production factor. Demand – elasticity demand in the aircraft industry. Offer in the aircraft industry. Market characteristics, forms and role in the aircraft industry. Financing indicators and their usefulness in the aircraft maintenance unit.</p>		
Suggested Readings			

Second Semester

Course Description	MATHEMATICS II		
Typical Semester	2 nd		
Category	General Core Course (GCC)	Obligatory course (O)	
Hours per Week	3 Theory	1 Applied Exercises	0 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the fundamental principles of differential equations, differential and integral calculus of more than one variable. • Apply the solutions principals of equations, differential and integral calculus of more than one variable in order to solve practical problems, which appear during the maintenance procedure of and manufacture of aircraft parts. 		
Syllabus	<p>Introduction to differential equations. First order differential equations. Superior order differential equations. Laplace equation. Differential function of more than one variable. Double integrals. Multiple integrals. Fundamental principles of vector analysis. Grad –Diy – Rot. Line integrals. Partial differential equations.</p>		
Suggested Readings	<p style="text-align: center;">Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, 8th Edition, October 1998. Stroud, Engineering Mathematics, The MacMillan Press, 1999.</p>		

Course Description	FLUID MECHANICS		
Typical Semester	2nd		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	12		
Work load	7		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the fundamental principles of fluid flow • Apply the kinematics and dynamics laws of fluid flow in order to solve practical problems, which appear during the maintenance procedure and manufacture of aircraft parts 		
Syllabus	<p>Introduction to fluid mechanics. Characteristics and properties of fluids. Hydrostatic. Aerostatic. Descried the Fluid flow description. Fluid flow – Lagrange equations – Euler equations - Flow line – Fundamental fluid flow equations. Incompressible flow. Ideal and real flow. Boundary layer. Similarity. Computational fluid mechanics.</p>		
Suggested Readings	<p>Streeter V.L.: Fluid Mechanics, Mc Grow-Hill Chung T.J.: Computational Fluid Dynamics, Cambridge University Press</p>		

Course Description	ENGINEERING MEASUREMENTS		
Typical Semester	2 nd		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Use the main measurement instruments of electrical and mechanical parameters. • Describe the basic structure of electrical and mechanical measurement instruments, as well as their respective advantages and drawbacks regarding their exploitation in various measurement conditions. • Explain the reasons that characterise the measurement results as a random variable. • Use techniques and tools for the assessment of measurement results. 		
Syllabus	<p>Measurement basics. Principles of electrical measurement instruments. Principles of mechanical measurement instruments. Instrument elements. Types of analog instruments, rotating element instruments. The application of Kirchoff laws into measurements. Wheastone Bridge. Impedance measurement. Capacitance measurement. Inductance measurement. Measurement equation - probabilities.</p>		
Suggested Readings	<p>J. Mandel, The statistical analysis of experimental data, Εκδόσεις Dover Publications Inc., ISBN: 0486646661 G.P. Box, W.G. Hunter, J.S. Hunter, Statistics for Experimenters, Εκδόσεις Wiley Interscience</p>		

Course Description	ELECTROTECHNICS		
Typical Semester	2nd		
Category	General Core Course (GCC)	Obligatory course (O)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • To use the Ohm and Kirchoff laws and the theorems pertaining the circuits in the analysis of electrical and magnetic circuits • Analyse circuits for the calculation of various circuit parameters selecting the most appropriate method. • To use simple linear circuits in order to solve problems pertaining to complex circuits • To solve problems related to electrical and magnetic fields 		
Syllabus	<p>Basics of electricity. Electric Field. Magnetic Field. Capacitance and Inductance. Kirchoff Laws – Voltage divider and current divider – Connection of voltage and current sources –Transformation of voltage and current sources. Linear resistive circuits. Theories pertaining electrical circuits. Alternating current – Complex representation of alternating current. Coulomb Law. Iron's magnetic properties. Magnetic circuits</p>		
Suggested Readings	<p>Desoer C. – Kuh E., Basic Circuit Theory, McGraw Hill Allan H. Robbins, Wilhelm Miller, Judd Robbins, Alan R. Miller, Circuit Analysis: Theory & Practice, Εκδόσεις Delmar Learning, 1999.</p>		

Course Description	COMPUTER AIDED DESIGN		
Typical Semester	2nd		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	0 Theory	0 Applied Exercises	4 Lab
ECTS Credits	3		
Work load	4		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Design aircraft parts in 3D solid models using the computer • Design aircraft assemblies in 3D solid models using the computer 		
Syllabus	<p>Introduction to CAD theory. Introduction to the design software environment. Design parts with addition and deduction. Design parts with holes, symmetries and copy sketches. Design rotary parts with finishing edges. Design cells. Design sheet metals. Assemblies. Create mechanical drawings from 3D solid models.</p>		
Suggested Readings	<p>Mastering Autocad 2004 and Autocad LT 2004, Omura George, Sybex, 2003 Graphics Concepts with SolidWorks, Richard M. Lueptow, Michael Minbiole Prentice Hall, 2004</p>		

Course Description	MANAGEMENT OF MAINTENANCE FACILITIES		
Typical Semester	2 nd		
Category	Human Factors and Legislation Course (HFLC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	0 Lab
ECTS Credits	6		
Work load	3		
Aims	On successful completion of the course, students will be able to: <ul style="list-style-type: none"> Describe the managerial methods of maintenance facilities 		
Syllabus	Statistics and probabilities elements. Techniques and organization methods of maintenance procedure. Diagnostic technique in maintenance. Planning and programming of maintenance. Duration and maintenance cost. The computer unit in the maintenance procedure. Supplies – Stock independent demand. Statistical process control. Quality control with acceptance sampling. Quality assurance systems.		
Suggested Readings	Joel Levitt, The Handbook of Maintenance Management, Industrial Press Inc. William J. Stevenson, Production / Operations Management, McGraw-Hill.		

Third Semester

Course Description	APPLIED MATHEMATICS		
Typical Semester	3rd		
Category	General Core Course (GCC)		Obligatory course (O)
Hours per Week	2 Theory	2 Applied Exercises	0 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Determine the techniques of solving equations and systems of equations based on applied mathematics. • Apply the principles of equation solutions using applied mathematics in order to solve practical problems which appear during the maintenance procedure and manufacture of aircraft parts. 		
Syllabus	<p>Introduction to applied mathematics. Errors. Linear algebra problems. Solution of non-linear equations. Numerical differentiation. Numerical integration. Functions interpretation. Numerical solution of differential equations. Numerical solution of system of differential equations. Programming with MATLAB.</p>		
Suggested Readings	<p style="text-align: center;">Laurene V. Fausett, "Applied Numerical Analysis Using MATLAB" Prentice Hall 1999. George Lindfield and John Penny "Numerical Methods Using MATLAB", Prentice Hall, 1999</p>		

Course Description	MECHANICS		
Typical Semester	3rd		
Category	General Core Course (GCC)	Obligatory course (O)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyse the basic means, principles and methods of mechanics, basic static and also kinematics and dynamics. • Apply the principles and methods of mechanics in solving simple practical static problems, and also to make models of technical problems which occur during the maintenance procedure and manufacturing of aircraft parts. 		
Syllabus	<p>Classic (Newtonian) mechanics. Vectorian calculus. Solid static. Solid body, free body diagram. Equilibrium of solid body in space. Flat cables. Slide and Static Friction. All body conveyor. Kinematics of material point. Dynamics of material point. Power, work, energy, principle of energy conservation, conservative forces. Principle of momentum conservation and angular momentum of the mass center of a materials point system. Impulse and Percussion. Kinematics of solid body, relative motion. Dynamic of solid body. General coordinates and Lagrange equations.</p>		
Suggested Readings	<p>F. Beer and E. Johnston, Vector Mechanics for Engineers, McGraw - Hill, New York. Engineering Mechanics, Statics and Dynamics by I. H. Shames, 1997</p>		

Course Description	ELECTRICAL MACHINES		
Typical Semester	3 rd		
Category	Special Core Course (SCC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Determine the basic types of electrical machines which are used in aircrafts • Describe the technical characteristics of the aircraft electrical machines and determine their working specification as well as their maintenance regulations. 		
Syllabus	Description, theory and analysis of steady-state performance are presented for the four types of electrical machines: Transformers, Induction motors, Synchronous machines, DC machines and generators. Equivalent circuits and vector diagrams are derived and used as the primary tools for analysis.		
Suggested Readings	<ol style="list-style-type: none"> 1. Fitzgerald A. E., C. Kingsley, Jr., and S. D. Umans. «Electric Machinery», 5th ed. New York: McGraw-Hill, 1990. 2. McPherson, George. «An Introduction to Electrical Machines and Transformers». New York: Wiley, 1981. 		

<ul style="list-style-type: none"> • Course Description 	AIR LAW AND REGULATIONS		
<ul style="list-style-type: none"> • Typical Semester 	3rd		
<ul style="list-style-type: none"> • Category 	<ul style="list-style-type: none"> • Human Factors and Legislation Course (HFLC) 		<ul style="list-style-type: none"> • Obligatory Course (O)
<ul style="list-style-type: none"> • Hours per Week 	2 Theory	0 Applied Exercises	0 Lab
<ul style="list-style-type: none"> • ECTS Credits 	3		
<ul style="list-style-type: none"> • Work load 	6		
<ul style="list-style-type: none"> • Aims 	<ul style="list-style-type: none"> • On successful completion of the course, students will be able to: <ul style="list-style-type: none"> • Determine the basic laws with which the aeronautic industry works and the ground personnel. • Describe specialties and capabilities, degrees and permissions of Public Aviation Service which refers to service personnel of aircrafts. • Describe the European and international organizations of contracts and regulations. 		
<ul style="list-style-type: none"> • Syllabus 	<ul style="list-style-type: none"> • Analysis of laws relative to the Public Aviation Service. Regulative context. Regulation EASA Part-66, Part-145. Service Responsibility. Usage of Service. Program of Aircrafts Service. Aircrafts Certification. Records. Valid National and International requests. Modifications and repairs. Analysis of the laws relative to Hygiene and Safety of Employees. Thoroughly description of the parameters that affects unfavorably the employees hygiene and the safety of the ground personnel. 		
<ul style="list-style-type: none"> • Suggested Readings 	<p style="text-align: center;">Krause, Shari Stamford, Aircraft Safety, McGraw-Hill Education - Europe,2003</p> <p style="text-align: center;">Balfour, J. M., Gardiner, Richard K., Goh, Jeffrey, Margo, Rod D., Air Law, LexisNexis UK, 1991</p>		

Course Description	INTRODUCTION TO TELECOMMUNICATIONS		
Typical Semester	3rd		
Category	Special Core Course (SCC)	Obligatory course (O)	
Hours per Week	2 Theory	2 Applied Exercises	0 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the basic elements of a telecommunication system • Determine the performance of a telecommunication system as a function of signal to noise ratio • Express a signal in frequency domain • Perform basic calculations concerning CW modulated signals and assess the results • Describe the operation of various CW modulators and demodulators and give basic comparative features • Perform the conceptual design of a CW communication systems 		
Syllabus	Signals and systems. Amplitude Modulation. Angle Modulation (FM and PM). Noise in CW modulation. Conceptual system design.		
Suggested Readings	<p>A. Bruce Carlson, "Communication Systems", McGraw Hill Robert Cagliardi, "Introduction to Communication Engineering", John Wiley & Sons, 1978</p>		

Course Description	ANALOG ELECTRONICS		
Typical Semester	3rd		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyse and design analog electronic circuits • Describe the features of basic electronic circuit configurations • Read and exploit the datasheet information in the analysis and design of analog electronic circuits. 		
Syllabus	Semiconductor physics. Diodes. BJTs. FETs. Transistor amplifiers. Amplifiers in frequency domain. Feedback. Operational amplifiers. Active filters. Oscillators, Multivibrators. Power transistors and power amplifiers.		
Suggested Readings	Practical Analog Electronics for Technicians, Kimber, W.A., Butterworth-Heinemann Ltd Basic Circuit Theory, C. Desoer, E. Kuh, Mac Graw Hill,		

Course Description	INTRODUCTION TO ELECTRONICS		
Typical Semester	3rd		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	On successful completion of the course, students will be able to: <ul style="list-style-type: none"> • Analyse basic electronic circuits • Describe the features of basic electronic circuits circuit 		
Syllabus	Semiconductor physics. Diodes. BJTs. FETs. Introduction to operational amplifiers. Power electronics. Introduction to combinational logic and digital circuits. Sequential circuits. Microcontrollers. Optoelectronics. Sensors.		
Suggested Readings	P. Horowitz, W. Hill, The Art of Electronics, Cambridge University Press T. Hayes, P. Horowitz, Student Manual for the Art of Electronics, Cambridge University Press		

Fourth Semester

Course Description	INTRODUCTION TO AUTOMATIC CONTROL		
Typical Semester	4 th		
Category	Special Core Course (SCC)	Obligatory course (O)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the basic formation of the control systems with feedback. • Design in simple way linear control systems with feedback. 		
Syllabus	<p>Definition of dynamic system. Laplace transformation and transmission function. Fourier transformation and transmission function. Bode diagrams. Response in time field, contraction, overlaps. Recognition methods of dynamic systems. The mean of situation, the field of situations. Feedback. Stability. Characteristic polynomial of close system, Stabilities. Classic form of regulators. Counterbalance.</p>		
Suggested Readings	<p>1. Ogata, Modern Control Engineering, Prentice Hall International Editions</p>		

Course Description	INTRODUCTION TO AERODYNAMICS		
Typical Semester	4 th		
Category	Special Core Course (SCC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	0 Lab
ECTS Credits	3		
Work load	6		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the creation of uplift flow and its change compare to geometry, height and velocity. • Calculate the force of resistance and the conservation of aircraft in air. • Describe the change of forces and their distribution during the flight. 		
Syllabus	Introduction to Aerodynamics. Primitive principles of ideal flow. Primitive dynamic flows. Aerodynamics forces and torques. Wing of infinite length in incompressible flow. Wing of finite length in incompressible flow. Wind tunnels.		
Suggested Readings	<p>N. F. Krasnov, "Aerodynamics", vol-1 and vol-2, MIR, 1985 J. D. Anderson Jr., "Fundamentals of Aerodynamics", McGraw Hill, 1991</p>		

Course Description	TECHNICAL ENGLISH		
Typical Semester	4 th		
Category	Special Course (SC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	0 Lab
ECTS Credits	3		
Work load	6		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Translate English technical terms which are used in manuals for aircraft service. • Use English technical terms to describe functions of the aircraft conservation and service. 		
Syllabus	<p>Technology of Aircraft Materials. Materials of Aircrafts construction. Cleaning and colors of aircrafts. Ground Means of Support Aircrafts. Aerodynamics of Aircrafts. Aircrafts structures. Aircrafts hydraulic system. Flight control system of Aircrafts. Landing system. Fire protection and fuel feeding. Compression, air conditioning, deicing of aircraft. Oxygen system and rescuing systems.</p>		
Suggested Readings	<p style="text-align: center;">AC 65-9A : Airframe und Power plant Mechanics, General Handbook, 3 / 3/ 99, U.S. Department of Transportation, FAA AC 65-15A : Airframe und Powerplant, Mechanics, Airframe Handbook 3/3/99 U.S. Department of Transportation, FAA.</p>		

Course Description	AIRCRAFT STRUCTURES		
Typical Semester	4 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the manufactures which are used in construction of aircraft structures (wings, spindle, tail etc.) • Describe the form of the imposed loads and their action in the aircraft structures. • Describe the characteristics of the materials which are used in the aircraft construction.. 		
Syllabus	<p>Basic distinction of the constructions which used in the composition of an aircraft. Introductive means from the elasticity theory. Static unidentified beams and nettings, methods of forces and displacements calculation for over static beams and nettings. Bending of thin beams aspen and close sections. Torsion of thin beams aspen and close sections. Frames of aircrafts. Shells. Shell wing. Composite materials. Structural stability. Special topics in design, certification and service of the aircraft structure.</p>		
Suggested Readings	<p>J. Cutler "Understanding Aircraft Structures" 3rd Ed., Blackwell Science Ltd., 1999. B. K. Donaldson "Analysis of Aircraft Structures", McGraw-Hill, 1993</p>		

Course Description	THERMODYNAMICS		
Typical Semester	4th		
Category	Special Core Course (SCC)		Sector Obligatory course (SO)
Hours per Week	2 Theory	1 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	9		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the phenomena in which all the energy transformation are based. • Describe the principles of internal energy, enthalpy, work, heat, entropy and analyze the basic principles and axioms of thermodynamics. • Calculate the thermodynamic properties and the energetic quantities. 		
Syllabus	<p>Fundamentals of engineering thermodynamics: thermodynamic system, control volume concept, units of measurement, energy, work, heat, property of pure substances. The first law of thermodynamics: forms of energy, conservation of energy, thermodynamic properties, conservation of mass and the first law applied to a control volume, the steady-state steady-flow process, the uniform-state uniform-flow process. The second law of thermodynamics: the Carnot cycle, the thermodynamic property entropy, the T-s and h-s diagram, reversible and irreversible processes, efficiency. Application to engineering systems, power and refrigeration cycles: Otto cycle, diesel cycle, refrigeration cycles, turbines, compressors, pumps.</p>		
Suggested Readings	<p style="text-align: center;">R. E. Sonntag, C. Borgnakke, G. J. Van Wylen "Fundamentals of Thermodynamics", John Wiley & Sons, 1997. J. Rayner, R. Joel "Basic Engineering Thermodynamics", Addison-Wesley Pub Co., 1998.</p>		

Course Description	STRENGTH OF MATERIALS		
Typical Semester	4 th		
Category	Special Core Course (SCC)		Sector Obligatory course (SO)
Hours per Week	2 Theory	1 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	9		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> Analyze the basic laws of strength of materials. Apply the principles of basic laws of strength of materials for the solving of practical problems which appears during the maintenance and construction of aircraft parts. 		
Syllabus	<p>Tension, Compression and Shear. Introduction to Strength of Materials. Normal stress and strain. Mechanical Properties of Materials. Elasticity, Plasticity, Creep. Linear Elasticity, Hooke's law and Poisson's ratio. Shear Stress and Strain. Mechanical Tests: Tension, Compression, Shear. Torsion. Torsional Deformations of a Circular Bar. Circular Bars of Linearly Elastic Materials. Stresses and Strain in Pure Shear. Relationship between Moduli of Elasticity E and G. Transmission of Power by Circular Shafts. Torsion Test. Stresses in beams. Pure Bending and Nonuniform Bending. Curvature of a Beam. Strains in Beams (Longitudinal, Normal, Shear). Beams with Axial Loads. Analysis of Stress and Strain. Plane Stress. Principal Stresses and Maximum Shear Stresses. Mohr's Circle for Plane Stress. Hooke's Law for Plane Stress. Triaxial Stress. Plane Strain. Bending: Slope and Deflection. Differential Equations of the Deflection Curve. Slope and Deflection by the double-Integration Method. Discontinuous loading: Macaulay's Method. Method of Superposition. Flexural (Bending) Tests. Buckling of Columns. Buckling and Stability. Columns with Pinned Ends. Columns with Other Support Conditions. Buckling Tests. Special Topics: Materials behavior and Mechanical Tests. Fracture Mechanics (toughness measurement). Repeated Loading and Fatigue. Creep and Viscoelasticity. Impact Loading. Hardness.</p>		
Suggested Readings	<p>Mechanics of Materials, Russell C. Hibbeler, Prentice Hall, 6th edition, 2005</p> <p>Mechanics of Materials by James M. Gere, Nelson Thornes Ltd, 5th edition, 2002</p>		

Course Description	DIGITAL ELECTRONICS		
Typical Semester	4 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyse and design of both combinational and sequential digital circuits • Read and exploit data sheet information in the analysis and design of digital circuits. 		
Syllabus	Number systems. Gates. Basic combinational circuits. Reduction methods. Complex combinational circuits. Sequential circuits. Finite states sequential machines. Memories. Memory circuits.		
Suggested Readings	1.The Design Of Cmos Radiofrequency Intergrated Circuits ,Thomas H. Lee, Cambridge Univ. Pr. 2.Avionics Collinson, R.P.G Kreiger 3.Operation And Modeling Of The Mos Transistor, Yannis P. Tsvidis, Mcgraw-Hill		

Course Description	TELECOMMUNICATION SYSTEMS		
Typical Semester	4 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	1 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	9		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the structure of binary communication systems • Calculate the basic performance parameters pertaining to binary communication system depending to the type of modulation 		
Syllabus	<p>Probabilities and stochastic process. Analog to digital conversion – Delta modulation. Binary signaling. Baseband signal transmission. Modelisation of communication channel. Digital modulation techniques. M ary modulation of phase, amplitude and frequency. Error probabilities. Channel encoding and codes. Techniques of spread spectrum.</p>		
Suggested Readings	<p>1. Marvin K. Simon, Jim. K. Omura, Robert A. Scholtz, Barry K. Levitt, "Spread Spectrum Communications Handbook", McGraw-Hill, 1994 2. Don J. Torrieri, "Principles of Secure Communication Systems", Artech House, 1985.</p>		

Course Description	ELECTROMAGNETIC WAVES - PROPAGATION - ANTENNAS		
Typical Semester	4 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	1 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	9		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Calculate basic parameters pertaining to antennas and electromagnetic field propagation • Assess the radiation patterns of various antennas and antenna arrays • Describe the features pertaining to the aircraft antennas 		
Syllabus	Maxwell equations. Poynting equation. Hertz antenna. Antenna parameters. Radiation patterns. Antenna arrays. Practical antennas. Aircraft antennas. Propagation.		
Suggested Readings	<p>D. Cheng, Field and Wave Electromagnetics, Εκδόσεις Prentice Hall, ISBN 0201128195</p> <p>Henri Jasik, "Antenna Engineering Handbook", McGraw Hill, 1961</p>		

Fifth Semester

Course Description	FLIGHT MECHANICS		
Typical Semester	5 th		
Category	Special Core Course (SCC)	Obligatory course (O)	
Hours per Week	2 Theory	2 Applied Exercises	0 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Discern the different phases of flight and the characteristic action of the aircraft • Determine the forces, torques, velocities and accelerations, in an aircraft during the evasions • Study the diagrams of aircraft performance 		
Syllabus	<p>Introduction to Flight Mechanics. Basic marks of aerodynamics. Propulsion of aircraft. Linear Horizontal Flight (L.H.F.) of aircraft. Upward and downward flight of aircraft. Take off. Performance. Range – Special aircraft's range. Evasion and acrobatic of aircraft. Twisty flight, movement equations. Spin. Check of aircraft. Preview design of aircraft which is based on the performance analysis.</p>		
Suggested Readings	<p style="text-align: center;">Von Mises R. "Theory of Flight", Dover Publications Inc, 1959. J.D. Anderson "Introduction to Flight", 3rd Ed, McGraw-Hill, New York, 1989.</p>		

Course Description	AIRCRAFT SYSTEMS		
Typical Semester	5 th		
Category	Special Core Course (SCC)		Sector Obligatory course (SO)
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Report the aircraft systems, to describe their role and to determine their position in the airplane • Determine possible malfunction with the help of manufacturing drawings of the aircraft systems 		
Syllabus	<p>Aircraft electrical systems. Hydraulic systems. Pneumatic systems. Gears. Air conditioning system of cabin. System of fuel feeding. Control system of ice and rain. Fire protection system. Flight control system. Passengers comfort system.</p>		
Suggested Readings	<p>Airframe and Powerplant Mechanics, Federal Aviation Authority, EA-AC65-15A Hydraulics and Pneumatics: A Technician's and Engineer's Guide. Andrew Parr 1999</p>		

Course Description	MACHINE ELEMENTS		
Typical Semester	5 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Recognize the machine elements that are inside the aircraft systems • Calculate the distress of machine elements that compose the aircraft mechanisms • Choose the appropriate machine elements for the prototype design of the aircraft mechanisms 		
Syllabus	Basic knowledge of strength of materials. Rivets and riveting – Tolerances and joining. Bolts and screws. Axles and shafts. Rolling and sliding bearings. Joints and breaks. Wire ropes. Belts – chains – springs. Gears. Pipes.		
Suggested Readings	<p style="text-align: center;">Mechanical Engineering Design, Ch. R. Mischke, J. Edward Shigley, McGraw-Hill, 7th edition, 2004.</p> <p style="text-align: center;">Fundamentals of Machine Elements, B. J. Hamrock, B. Jacobson, S. R. Schmid, McGraw-Hill, 1999</p>		

Course Description	WELDING MECHANICS		
Typical Semester	5 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the welding methods which are used in aircraft technology and to describe the characteristics of each method. • Determine the factors that affect the welding in depends on the physiochemical characteristic of the welding materials and the parameter of the technique that will be used. • Choose the best type of weld and calculate its mechanic strength. 		
Syllabus	<p>Metallurgical phenomena during welding. Oxy-fuel. Shielded Metal Arc Welding. Tungsten Inert Gas. Electro-beam welding. Resistance welding. Aluminum alloys welding. Magnisium alloys welding. Nikel alloys welding. Design and calculation of the welding. Destructive and non destructive methods of welding inspection.</p>		
Suggested Readings	<p style="text-align: center;">“Airframe and Powerplant Mechanics – power plant Handbook”, Federal Aviation Administration Althouse, Turnquist, Bowditch, “Modern Welding”, American Welding Society</p>		

Course Description	PROPULSION MECHANICS		
Typical Semester	5th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Determine the factors that affect the aircraft engine propulsion. • Define the propeller construction characteristics and explain the maintenance procedure 		
Syllabus	<p>Engine propulsion. Fundamentals of air-propulsion. Propulsion equations. Factors that affect the engine propulsion. Propellers basic concepts. Fundamentals of propeller movement. Air-propeller construction. Propeller step control. Propeller synchronization. Anti-ice propeller protection. Propeller maintenance</p>		
Suggested Readings	<p>A. C. Kermode, "Mechanics of Flight", Longman 1991 "Airframe and Powerplant Mechanics, Powerplant Handbook", Federal Aviation Administration</p>		

Course Description	DIGITAL AUTOMATIC CONTROL		
Typical Semester	5 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the basic characteristics of a digital controller. • Design a linear digital controller. 		
Syllabus	<p>Introduction & History of Automation. Design for Automation and Processes: Determining appropriate levels of manufacturing automation based on economics and productivity. Elements of automation: EDM, PLC's, Sensors and Simulation, conveyors, part feeders, AGV's, AS/RS. Human Side of Automation. Cells and Robots. PID controllers. Digital stability.</p>		
Suggested Readings	<p>B. Kuo, Digital Control Systems, Εκδότης: Oxford University Press G. F. Franklin, J.D. Powell, M. Workman, Digital Control of Dynamic Systems, Addison – Wesley</p>		

Course Description	POWER ELECTRONICS		
Typical Semester	5 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	2 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	10		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the operation of power electronic components and their circuits. • Calculate the basic parameters pertaining to power electronic circuits. • Select the most appropriate circuit configuration depending to specific applications. 		
Syllabus	<p>Power semiconductors. Optoelectronic components. Thyristors. Switching diode circuits. AC and DC circuits. Starters and stoppers with thyristors. Electronic power systems. AC-DC rectifiers. Inverters. AC-DC converters. Alternating current controllers. Power electronics components. Power diodes, power transistors, power MOSFETs. IGBTs. Power electronics applications.</p>		
Suggested Readings			

Course Description	TELECOMMUNICATION ELECTRONICS		
Typical Semester	5 th		
Category	Special Course (SC)		Sector Obligatory course (SO)
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the features of transmitters and receivers • Design basic RF circuits which are blocks of a communication system 		
Syllabus	Basic RF circuits. Tuned amplifiers. Double tuned amplifiers. Impedance matching. Active two port circuits. Noise and distortion. Power RF amplifiers. Oscillators. Mixers. PLLs and frequency cynthetizisers.		
Suggested Readings	<p>Kenneth K. Clarke, Donald T. Hess, "Communication Circuits Analysis and Design", Addison-Wesley Publishing Company, 1978 V. V. Shakhgildyan, "Radio Transmitters", MIR, 1981</p>		

Course Description	SENSOR TECHNOLOGY		
Typical Semester	5 th		
Category	Special Core Course (SCC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe various sensor types and their technologies • Describe signal processing techniques related to sensors • Indicate the appropriate sensors for airborne applications. • Indicate the appropriate sensors for industrial applications 		
Syllabus	Sensor parameters. Values to be detected an to be measured. Mechanical sensors. Field sensors. Thermodynamic sensors. Chemical sensors. Sensor applications. Sensor calibrations. Testing facilities. Smart sensors. Sensors as components of automation systems.		
Suggested Readings	<p>JON S WILSON, Sensor Technology Handbook, Elsevier, 2005 JOHN G. WEBSTER, The Measurement, Instrumentation and Sensors Handbook, 1998</p>		

Sixth Semester

Course Description	AIRCRAFT INSTRUMENTS AND NAVIGATION SYSTEMS		
Typical Semester	6 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the operation of aircraft flight and navigation instruments • Describe the operation of basic radionavigation receivers and the principles of inertial systems • Describe the operation of engine instruments 		
Syllabus	<p>Instrument components and mechanisms. Principles of servomechanisms. Air data and Pitot – Static system. Flight instruments. Magnetic compass. Gyro instruments. Radionavigation systems. Flux gate. Principle of inertial and satellite based navigation. Flight Director Indicator. Engine and auxiliary instruments. Electronic Flight Instrument Systems.</p>		
Suggested Readings	<p>Brian Kendal, "Manual of Avionics", Blackwell Science, 1999. Keith W. Bose, "Aviation Electronics", Jeppesen, 1983.</p>		

Course Description	PISTON (RECIPROCAL) ENGINES		
Typical Semester	6 th		
Category	Special Course (SC)		Sector Obligatory course (SO)
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the thermodynamic cycles in reciprocal engines and analyse their thermodynamic characteristics. • Recognize the special characteristics of the reciprocal aircraft engines, their components and systems • Analyse and follow the maintenance reciprocal air-engine procedure as described in manufacturers manual 		
Syllabus	<p>Aircraft engines historical progress and basics in thermodynamic. Gas phase transformation. Reciprocal engine thermodynamic. Petrol and diesel engines. Lubrication, cooling and fuel providing system. Engine attachment on the aircraft construction. Engine starting and fire extinguisher system. Working limits and maintenance of reciprocal engines. Reciprocal engine mechanical failure inspection. Maintenance, adjustments and fixing of reciprocal aircraft engines. Helicopters reciprocal engines. Aircraft reciprocal engine performance.</p>		
Suggested Readings	<p>“Airframe and Powerplant Mechanics”, FAA EA-AC65-12A “Training Manual Powerplant Section Book 1”, EA-ITP-P1, Aviation Maintenance Publishers Inc.</p>		

Course Description	HELICOPTER AERODYNAMICS		
Typical Semester	6 th		
Category	Special Course (SC)		Sector Obligatory course (SO)
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • report the aerodynamic phenomena during the helicopter flight • calculate the helicopter flight conditions during the horizontally and vertical flight 		
Syllabus	<p>Induction to the helicopter . Basic configuration of helicopters . Vertical flight of helicopter . Momentum theory hovering and vertical movement of helicopter . Horizontal flight of helicopter . Flapping motion. Balance of forces and torque, balance of force in the helicopter. Factors that affect the records of helicopter . Stability and control of helicopter flight. Support loss of the helicopter impeller. Helicopters design standards.</p>		
Suggested Readings	<p>J. Seddon & S. Newman "Basic Helicopter Aerodynamics"2nd Ed., Blackwell Science 2002 . G. Done & D. Balmford "Helicopter Dynamics" 2nd Ed., Butterworth - Heinmann 2001.</p>		

Course Description	FUELS AND LUBRICANTS		
Typical Semester	6th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Report the characteristics of fuels and lubricants that are used in the aircrafts • Define troubleshooting in fuel or lubrication system in an aircraft. 		
Syllabus	<p>Energy and conventional fuels. Crude oil. Gasoline Derv. Jet fuels . Fuels of gas turbines. Effect of height of flight in the combustion. Process and additives of mineral oils. Properties of mineral oils. Lubricant greases. Grease production.</p>		
Suggested Readings			

Course Description	MANUFACTURING PROCESSES OF AIRCRAFT MATERIALS		
Typical Semester	6 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Determine the conventional and non conventional methods which are used to manufacture the parts that compose the aircraft. • Determine the factors that affect the manufacturing process. • Choose the best type of manufacturing process concerning the material characteristics and the economical restrictions that are imposed. 		
Syllabus	<p>Basic principles of metallurgy. Casting. Conventional machining with material removal. Planing, turning, and drilling. Milling and grinding. Welding - Electro-beam welding. Thermal and metallurgy phenomena during welding. Prosecuting and control methods of welding. Introduction to plastic deformation forming. Configuration of lamina. Configuration of compact material. Non conventional forming.</p>		
Suggested Readings	<p>Serope Kalpakjian, Steven R. Schmid, "Manufacturing Processes for Engineering Materials", Prentice Hall, 4th edition, 2002. E.P. De Garmo, J.T. Black, "Materials and processes in manufacturing", 1996.</p>		

Course Description	COMPOSITE MATERIALS		
Typical Semester	6 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	2 Applied Exercises	0 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Define the properties and characteristics of composite materials that can be used in manufacturing or repairing aircraft parts. • Calculate the mechanic characteristics of a fibre reinforced composite material. • Estimate the load fracture of composite materials concerning their natural and mechanical properties. 		
Syllabus	<p>Introduction of the composite materials. Reinforcing using fibers and matrices. Polymeric matrix composite materials (PMC). Metal matrix composite materials MMC. Introduction of polymeric materials. Structure and corruption of polymers. Processing and connecting techniques of polymers. Faults of polymers composite material processing.</p>		
Suggested Readings	<p>An Introduction to Composites Materials, D. Hull, T. W. Clyne, Cambridge University Press (C.U.P.), 1996 Composites Materials Vol. 1: Properties, Non-destructive Testing and Repair, M. Mel. Schwartz, Prentice Hall, 1997</p>		

Course Description	AIRCRAFT ELECTRICAL SYSTEMS		
Typical Semester	6 th		
Category	Special Course (SC)		Sector Obligatory course (SO)
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the operation of systems composing the aircraft electrical network • Analyse the configuration and the interaction of various aircraft electrical circuits • Read and track the blueprints of aircraft electrical systems 		
Syllabus	DC sources. Voltage stabilization. AC sources. Power conversion equipment Auxillary power units. Electrical power distribution. Network control systems. Network protection systems. Measurement instruments and warning lights. Voltmeters, ampermeters and frequencymeters. Electrical motors. Lights. Fire protection, anti-ice protection systems. Landing gear systems.		
Suggested Readings	E. H. J. Pallett, "Aircraft Electrical Systems", Longman, 1987 "Installation Practices, Aircraft Electric and Electronic Wiring", Technical Manual, T.O. 1-1A-14		

Course Description	MICROWAVES		
Typical Semester	6th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyse and design microwave circuits based on transmission lines or waveguides • Design microwave measurement system based on microwave circuit theorems 		
Syllabus	Principles of transmission lines. Smith chart. Impedance matching. Waveguides. Microwave circuits and components. Microwave tubes. Microwave semiconductor components.		
Suggested Readings	<p>R.E. Collin, Foundations for Microwave Engineering, Εκδόσεις McGraw-Hill</p> <p>D. M. Pozar, Microwave Engineering,, Εκδόσεις John Wiley & Sons</p>		

Course Description	AIRCRAFT INSTRUMENTS		
Typical Semester	6th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the instruments composing the flight deck • Conceptually design and equip a flight deck accordingly. 		
Syllabus	<p>Aircraft instrument basics and elements. Principles of servomechanisms. Pitot – Static system. Flight instruments. Air Data Computer. Magnetic compass. Gyro instruments. Radionavigation instruments. Flux valve. Flight Director Indicator. Engine instruments. Auxiliary instruments, EFIS, ECAM, EICAS, FMCS.</p>		
Suggested Readings	<p>Brian Kendal, "Manual of Avionics", Blackwell Science, 1999. Keith W. Bose, "Aviation Electronics", Jeppesen, 1983.</p>		

Course Description	MICROPROCESSORS		
Typical Semester	6th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the microprocessor architecture • Design in H/W and S/W simple microprocessor based applications 		
Syllabus	<p>Number systems – Hexadecimal system. Structure of 68000. Microprocessor instructions. Memory and memory access. Mass storage. Connection of peripheral units on to microprocessor. Assembly programming. Programming with C. Drivers. Microprocessor based system design case study.</p>		
Suggested Readings	<p>Peter Marwedel, Embedded System Design, Kluwer Academic Publishers, ISBN 1-4020-7690-8 The ADA 95 Language Reference Manual</p>		

Course Description	AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEMS		
Typical Semester	6 th		
Category	Special Course (SC)		Sector Obligatory course (SO)
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the operation of aircraft communication and navigation systems and of their respective building blocks. • Calculate basic parameters pertaining to the performance of aircraft communication and navigation systems 		
Syllabus	<p>Intercom. Cockpit Voice Recorder. ELT. HF, VHF and UHF communication systems. Principles of navigation. Geodetic systems. Euler angles. Sagniac effect. Laser and fiber gyros. Dither mechanisms. Inertial Navigation Systems. Inertial sensors, Basic circuits. System errors, Initialization. ADF receiver. Sense and directional antennas. VOR beacon and VOR receiver. DME and TACAN. ILS, MLS systems. Hyperbolic navigation systems. OMEGA, LORAN and VLF navigation systems. GPS, Galileo, Glonass and GNSS.</p>		
Suggested Readings	<p>Brian Kendal, "Manual of Avionics", Blackwell Science, 1999. Keith W. Bose, "Aviation Electronics", Jeppesen, 1983.</p>		

Course Description	FLIGHT STABILITY AND AUTOMATIC FLIGHT CONTROL		
Typical Semester	6th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	0 Applied Exercises	2 Lab
ECTS Credits	5		
Work load	8		
Aims	On successful completion of the course, students will be able to: <ul style="list-style-type: none"> • Describe the aircraft automatic flight control • Solve guidance and stability related problems of air vehicles 		
Syllabus	Atmospheric flight mechanics Static stability and control. Aircraft equations of motion. Longitudinal and lateral dynamics. Aircraft response to control and atmospheric inputs. Longitudinal and lateral automatic control. Automatic control, applications on conventional and modern control theories		
Suggested Readings	Etkin, Bernard, and Lloyd Duff Reid. Dynamics of Flight: Stability and Control. 3rd ed. New York: Wiley, 1995. Nelson, Robert C. Flight Stability and Automatic Control. 2nd ed. Boston, MA: McGraw Hill, 1997.		

Seventh Semester

Course Description	PROFESSIONAL ETHICS		
Typical Semester	7 th		
Category	Human Factors and Legislation Course (HFLC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	0 Lab
ECTS Credits	3		
Work load	6		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> Describe the role of human factor in ethics in the aircraft maintenance environment 		
Syllabus	<p>Human factors. Human limits. Social Psychology. Factors that influence the work load. Working environment. Duties. Human faults. Ethics - Deontology : basic significances, regulation. The personality of the graduate is a decision critical factor. Scientific ethics. Papers.</p>		
Suggested Readings	<p>Oakley J, Virtue Ethics and Professional Roles. Cambridge University Press, 2001 Bouchoux D.E, Protecting Your Company's Intellectual Property: A Practical Guide to Trademarks. AMACOM, 2001.</p>		
Course Description	PROFESSIONAL ETHICS		
Typical Semester	7 th		
Category	Human Factors and Legislation Course (HFLC)		Obligatory course (O)
Hours per Week	2 Theory	0 Applied Exercises	0 Lab
ECTS Credits	3		
Work load	6		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> Describe the role of human factor in ethics in the aircraft maintenance environment 		
Syllabus	<p>Human factors. Human limits. Social Psychology. Factors that influence the work load. Working environment. Duties. Human faults. Ethics - Deontology : basic significances, regulation. The personality of the graduate is a decision critical factor. Scientific ethics. Papers.</p>		
Suggested Readings	<p>Oakley J, Virtue Ethics and Professional Roles. Cambridge University Press, 2001 Bouchoux D.E, Protecting Your Company's Intellectual Property: A Practical Guide to Trademarks. AMACOM, 2001.</p>		

Course Description	TURBINE ENGINES		
Typical Semester	7 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the basic characteristics of an aircraft turbine engine and recognize the main parts • Estimate the turbine engine power • Describe and follow the maintenance procedure 		
Syllabus	<p>Fundamental concepts. Introduction to the basic processes. Performance analysis. Types/arrangements of engine components. Compression processes. Combustion processes. Turbine Expansion process. Exhaust heat exchange process. Performance and characteristics. Instrumentation. Non-dimensional groups. Engine testing. Performance of a single shaft unit. Performance of a two-shaft unit. Characteristics of components. Theory of stationary gas turbine power plants. Design of gas turbines, Hardware & components Matching. Gas Turbines for Aircraft Propulsion.</p>		
Suggested Readings	<p>E. Charles, E. Otis, "Aircraft Gas Turbine Powerplant" Irwin Treager, "Aircraft Gas Turbine Engine Technology", Glencoe Aviation Technology</p>		

Course Description	PRINCIPLES OF AIRCRAFT DESIGN		
Typical Semester	7 th		
Category	Special Course (SC)		Sector Obligatory course (SO)
Hours per Week	2 Theory	1 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	9		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the main aspects of aircraft parts design. • Estimate the aircraft aerodynamic flight characteristics and the thermodynamic performance of the engines. • Select the aircraft parts or aircraft systems following the basic concepts of aircraft design. 		
Syllabus	Aircraft forces. Aircraft construction materials. Aircraft classification. Aircraft fuselage. Aircraft wings. Horizontal and vertical tail wings design. Engine fuselage and surroundings. Control flight planes design. Landing gear system desing. Aircraft weight and balancing.		
Suggested Readings	<p>Daniel P. Raymer, "Aircraft Design: A Conceptual Approach", AIAA Education series, 1999 Jan Roskam, "Airpplane Design" Part I - VIII, Roskam Aviation and Engineering Corporation, 1986</p>		

Course Description	AERODYNAMICS OF AIRCRAFT ENGINES		
Typical Semester	7 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	3 Theory	0 Applied Exercises	3 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the aerodynamic performance characteristics of the turbine engine main parts. • Describe the fundamentals on turbine engine design strategies. 		
Syllabus	<p>Turbine engines classification. Aerobic and anaerobic engines. Turbine engine thermodynamic. Sub system turbine engine performance. Engines air inlets. Turbine engines aerodynamic. Sub system turbine engine performance. Aerodynamic design of co working compressor and turbine in an aircraft turbine engine. Diffusers and combustion chambers. Propulsive and mixture nozzles. Turbine engine transient running.</p>		
Suggested Readings	<p>G.C. Oates "Aerothermodynamics of Aircraft Engine Components" AIAA Education Series, New York, 1985. N. Cumpsty "Jet Propulsion, A simple guide to the aerodynamic and thermodynamic design and performance of jet engines", Cambridge University Press, 1997.</p>		

Course Description	SPECIAL TOPICS OF FLIGHT MECHANICS		
Typical Semester	7 th		
Category	Special Course (SC)		Sector Obligatory course (SO)
Hours per Week	3 Theory	0 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	11		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Analyze the aircraft flight in supersonic velocities. • Describe the dangerous phenomena that occur in supersonic flight. • Analyze the aerodynamic phenomena related with the interaction between several aircraft parts. 		
Syllabus	Correlation with low-velocity flight. Shock waves. Reaching control to the critical Mach number. Supersonic aerodynamic. Supersonic flight wings sectors. Finite wings in supersonic flow. Aircraft construction for supersonic flight. Introduction to boundary layer theory.		
Suggested Readings	<p>I.H. Abbot & von A.E. Doenhoff "Theory of Wing Sections", Dover Publications Inc, New York, 1958. B.W. McCormick "Aerodynamics, Aeronautics and Flight Mechanics" Wiley, 1994.</p>		

Course Description	RADAR SYSTEMS		
Typical Semester	7 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	3 Theory	1 Applied Exercises	2 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the operation of various radar systems and their building blocks • Describe the radar signal processing techniques • Analyse a radar system • Perform a conceptual design of a radar system 		
Syllabus	<p>Radar basic principles. Radar Aoperation parameters. Radar equation. Radar targets. Reception and processing of echos. Tracking radar. Secondary radar. Transmitter circuits. Radar antennas. Signal processing. Weather radar. Traffic Alerting and Colision Avoidance System.</p>		
Suggested Readings	<p>G. Stimson, Introduction to airborne radar, Εκδόσεις Scitech Publishing Inc. P. Peebles, Radar Principles, Εκδόσεις John Wiley & Sons</p>		

Course Description	AIRCRAFT AUTOMATIC FLIGHT CONTROL SYSTEMS		
Typical Semester	7 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	2 Theory	1 Applied Exercises	2 Lab
ECTS Credits	6		
Work load	9		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the operation of autopilots and flight directors • Design controllers for solving problems pertaining to the automatic flight in simplified conditions 		
Syllabus	<p>Aircraft dynamics and stability. Atmospheric disturbances. Flying quality. Modelisation of aircraft sensors and actuators. AFCS block diagram. Stability augmentation systems. Attitude, altitude and heading control systems. Helicopter flight control systems. Flight by wire systems.</p>		
Suggested Readings	<p>D. Mc Lean, Automatic Flight Control Systems, Εκδόσεις Prentice Hall E. H. J. Pallett, Shaun Coyle "Automatic Flight Control", Blackwell Science, 1998.</p>		

Course Description	FIBER OPTICS TELECOMMUNICATION SYSTEMS		
Typical Semester	7 th		
Category	Special Course (SC)	Sector Obligatory course (SO)	
Hours per Week	3 Theory	0 Applied Exercises	3 Lab
ECTS Credits	7		
Work load	12		
Aims	<p>On successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Describe the building blocks of a fiber optic communication system • Design a fiber optic communication system and to determine its performance parameters 		
Syllabus	Principle of optics. Structure of optical fiber. Signal propagation in a fiber. Transmitter components. Receiver components. Fiber optic LAN equipment and components. Component connections on to fiber. Conceptual design of fiber LAN. Aircraft fiber optic networks – Flight by Light. ARINC 629 and MilBus 1773 architecture. Principles of integrated optics.		
Suggested Readings	<p>WILLIAM, B., Introduction to optical fiber communication systems, 1998. KEISER G., Optical Fiber Communications, 3rd ed., 2000</p>		

4.2 Language

All courses are taught in Greek except from the English language module.

4.3 Final exams - Evaluation Procedures

Students' performance in purely theoretical courses or in the theoretical aspect of mixed courses is evaluated through written examinations at the end of the semester. Optionally, there can be mid-term exams.

In a laboratory course, students' performance is assessed regularly with a relevant written report at the end of each lab session while there is also an overall assessment at the end of the semester.

For their practical training students' assessment is largely based on their employer's report which is concerned mainly with the conscientiousness and competence of the trainee; this one is a Pass/Fail course.

The progress of a senior project is monitored and evaluated by a supervising academic who assesses the performance of the student while working on it, the final outcome, and the student's presentation/oral examination before a three-member committee.

4.4 Academic calendar

Fall semester: September 29, 2008 - January 16, 2009

Exam period 1: January 26, 2009 – February 6, 2009

Exam period 2: February 9, 2009 – February 20, 2009

Spring semester: March 3, 2009 – June 12, 2009

Exam period 1: June 22, 2009 – July 3, 2009

Exam period 2: September 1, 2009 – September 14, 2009

Official Holidays

October 28 th	National Holiday
November 17 th	School Holiday
January 30 th	School Holiday
March 25 th	National and Religious Holiday
May 1 st	Official Holiday

During Christmas and Easter holidays no classes are held for one week in each holiday.

4.5 ECTS coordinator

Dr Antonios Baldoukas, Professor, E-mail: aktena@teihal.gr

5. Department of Foreign Languages

5.1 General Information

The department of Foreign Languages offers courses in four foreign languages including English, French, German and Greek. The academic staff of the department aim at the fulfillment of current and future language needs of the TEI students and the development of the required skills by the students so that they can meet those needs and acquire a competitive advantage when they enter the arena of their professional life.

A recently initiated course in the department focuses on the Greek language and Greek history addresses the academic and linguistic needs of foreign students studying at TEI. It consists of 4 academic hours per week for the Greek Language, and 2 for the cultural seminars which include excursions in archaeological sites around Halkida.

The learning process of specialised English language in the T.E.I of Chalkida, Greece gives the students an opportunity to broaden their knowledge of English language skills in a variety of forms and genres and in response to numerous socio-cultural, economical and technological developments emerging as an outcome of globalisation and Information Age. English language courses in TEI involve the enactment of an ongoing learning process engendering the following fundamentals:

1. **A learner- and learning-centred approach** - a move from teaching to learning
2. **A communicative and task-based approach** with authentic communication tasks and learning tasks
3. Emphasis on **developing language skills and strategies**
4. Emphasis on **creativity**
5. **ESP in higher classes** - better preparation for work or study tasks
6. More intensive use of the **modern language** in the classroom developing **language awareness** and familiarity with multicultural perspectives in different academic disciplines
7. **Variety** in working methods
8. Use of **information technology, multimedia, E-mail** etc.
9. Encouraging **learner autonomy, self-assessment, cross-cultural awareness**
10. **Project work** (based on authentic, real-life situations, also lab exercises)

The specialised English language courses for the TEI students have been designed on the guidelines of the “**Common European Framework of Reference for Languages**” which was constituted in 2001 and amended in the follow up report entitled “**EU Action Plan 2004-2006 - Promoting Language Learning and Linguistic Diversity**” (See APPENDIX 1). According to this framework the main aims of the EU policy are:

- Ä Expansion of benefits through life-long foreign language learning to all citizens
- Ä Improvement of foreign language teaching methods and
- Ä Development of a friendlier environment for languages.
- Ä Building language-friendly communities

For further information contact Ms Lefki Papacharalambous

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Office Hours: Monday and Wednesday, 10am-2pm.

5.2 Course Syllabus

Title	ELECTRICAL ENGINEERING – ENGLISH I		
Semester	2ND		
Department	Foreign Languages		
Category	S	Obligatory	
Type	Theoretical		
Hours/week	2 Lecture	Applied Exercises	Laboratory
Workload/Week	6		
ECTS points	3		
Prerequisites			
Objective:	To familiarize the students with the electrical, electronic and computer engineering terminology in the foreign language of their choice and train their written and oral skills.		
Course Description:	<p style="text-align: center;"><u>Specialised terminology on:</u></p> <ul style="list-style-type: none"> - Measurements, electrical fields and circuits. - Magnetism, machines and electronics. <p style="text-align: center;"><u>Reading and listening comprehension of technical and scientific texts.</u></p> <p style="text-align: center;"><u>Grammar exercises</u></p>		
Suggested Readings:	<p>1. PEPPA, IF., 2008, "THE LANGUAGE OF TECHNICAL ENGLISH", ION PUBLICATIONS</p> <p>2. EASTWOOD, J., 2007, "OXFORD LEARNER GRAMMAR INTERMEDIATE, OXFORD.</p>		

Title	ELECTRICAL ENGINEERING – ENGLISH II		
Semester	3RD		
Department	Foreign Languages		
Category	S	Obligatory	
Type	Theoretical		
Hours/week	2 Lecture	Applied Exercises	Laboratory
Workload/Week	6		
ECTS points	3		
Prerequisites	<p style="text-align: center;">ENGLISH I</p> <p>To enroll in this course, students need to have successfully completed 1 semester of studies in the English Language Level I in TEI; alternatively they should own a universally recognised certificate of English language competence (e.g. <i>Lower</i> or <i>Advanced</i> or <i>Proficiency</i> Certificate issued by Cambridge/Michigan University or or an equivalent certificate issued by the Greek Ministry of Education, YPEPTH).</p>		
Objective:	To familiarize the students with the electrical, electronic and computer engineering terminology in the foreign language of their choice and train their written and oral skills.		
Course Description:	<p style="text-align: center;"><u><i>Specialised terminology on:</i></u></p> <ul style="list-style-type: none"> - Measurements, electrical fields and circuits. - Magnetism, machines and electronics. <p style="text-align: center;"><u><i>Reading and listening comprehension of technical and scientific texts.</i></u></p> <p style="text-align: center;"><u><i>Grammar exercises</i></u></p>		
Suggested Readings:	<ol style="list-style-type: none"> 1. KIRIAZI-PAPAKONSTANTINOY, 2005, "ENGLISH FOR ELECTRICAL ENGINEERING AND ELECTRONICS - BOOK II", ELLIN PUBLICATIONS 2. GLENDINNING, E. H. & MCEWAN, J., 2005, "BASIC ENGLISH FOR COMPUTING", OXFORD, UK 		

Title	ELECTRICAL ENGINEERING – ENGLISH LANGUAGE TERMINOLOGY		
Semester	4 th		
Department	Department of Foreign Languages		
Category	Optional	Compulsory	
Type	Theoretical		
Hours/week	2 Lecture Hours		
Workload/Week	10		
ECTS points	4		
Prerequisites	<p align="center">ENGLISH I & II</p> <p>To enroll in this course, students need to have successfully completed 2 semesters of studies in the English Language Level I and Level II in TEI; alternatively they should own a universally recognised certificate of English language competence (e.g. <i>Lower</i> or <i>Advanced</i> or <i>Proficiency</i> Certificate issued by Cambridge/Michigan University or or an equivalent certificate issued by the Greek Ministry of Education, YPEPTH).</p>		
<p>Objective: This module is aimed for the students who are at the B2-C1 level of language competence on the CEF board and need to enhance their knowledge of the specialised foreign language used in their academic discipline to the extent that they will become able to literary or not, sophisticated and lengthy excerpts from specialized articles and lengthy technical guidelines related to their job specialty. Also on successful completion of this module learners should be able to understand the oral speech with no difficulty either in conditions of direct interaction or via mass communication media even when the fellow conversers talk fast, provided that there is adequate time for them to get familiar with a particular manner of speaking. Finally, they should also be able to identify the differences between different writing formats and produce written work of different formats (e.g. essays, articles, memos, reports, guidelines, etc).</p>			
<p>Course Description:</p> <ul style="list-style-type: none"> • The module includes reading comprehension and analysis of technical texts relevant to the area of Electrical Engineering at an advanced level of competence, ie: description of electronic components and devices, sources of electric energy, magnetism, cells and batteries, electromechanical devices, electronic communication systems, etc. • The teaching methodology involves complex listening and writing activities, speaking tasks, acquisition of technical terminology as well as a thorough revision of all the foreign language grammatical and syntactical phenomena that have been taught in previous levels. 			
<p>Teaching Methods</p> <ul style="list-style-type: none"> • Lecture • Seminar • Project work 			
<p>Assessment Methods Assessment takes place on a continuous basis and involves oral and written tests, presentations, assignments and project work. Most frequently used assessment methods are:</p> <ul style="list-style-type: none"> • End-of-term written exam paper • In-term Assignment • Poster presentation 			

Suggested Readings:

1. PAPACHARALAMBOUS, L. & PEPPA, IF., 2007, "ENGLISH FOR ENGINEERS", ELLIN PUBLICATIONS
2. KIRIAZI-PAPAKONSTANTINOU, 2005, "ENGLISH FOR ELECTRICAL ENGINEERING AND ELECTRONICS- BOOK IV", ELLIN PUBLICATIONS

APPENDIX 1

CEF (Common European Framework of Reference for Languages)

The Common European Framework divides learners into three broad divisions which can be divided into six levels:

A Basic User

A1 Breakthrough

A2 Waystage

B Independent User

B1 Threshold

B2 Vantage

C Proficient User

C1 Effective Operational Proficiency

C2 Mastery

The CEF describes what a learner is supposed to be able to do in reading, listening, speaking and writing at each level, in details:

level	Description
A1	Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.
A2	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.
B1	Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes & ambitions and briefly give reasons and explanations for opinions and plans.
B2	Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and

	disadvantages of various options.
C1	Can understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express him/herself fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organisational patterns, connectors and cohesive devices.
C2	Can understand with ease virtually everything heard or read. Can summarise information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express him/herself spontaneously, very fluently and precisely, differentiating finer shades of meaning even in more complex situations.

These descriptors can apply to any of the languages spoken in Europe, and there are translations in many languages.