

## FACULTY OF AERONAUTICS AND ASTRONAUTICS

Anadolu University School of Civil Aviation was established in 1986 in order to train personnel having suitable qualifications that Global Civil Aviation Sector. In the Avionics, Airframe and Powerplant Maintenance, Air Transportation Management, Air Traffic Control, and Flight Training Departments one year of Intensive English Language training and 4 years of undergraduate education is offered. Students are accepted to the Air Traffic Control and Flight Training Departments by an entrance examination conducted by the university following a preliminary registration. Students may get acceptance to the Avionics, Airframe and Powerplant Maintenance, and Air Transportation Management Departments by taking centralized examinations run on a national scale: Citizens of Turkey and Turkish Republic of Northern Cyprus should take the ÖSS; Citizens of Other Countries should take the YÖS (Foreign Student Examination).

At the School of Civil Aviation, there are an international airport, a JAR-145 certified maintenance center, 20 aircrafts, 28 laboratories; and flight, airport control, and radar simulators. Via the maintenance center that it has, the School has the ability to conduct the overall maintenance of aircrafts lighter than 5700 kg. At the School of Aviation with its, effectively run, Airport establishment, Air Traffic Control services, flight and maintenance operations, the students find the opportunity to learn in field the subject matters coinciding with their respective area of application.

With this integrated structure, The School continues its cooperation with the national and international aviation institutions and industry. The service provided in the Aviation Sector has international attributes as a result the personnel employed in this Sector and the educational institutions training this personnel have to be properly certified according to the standards. Since the past, the School of Civil Aviation is continuing its operation according to the international and national standards while offering education and conducting aviation operations. The School is one of the few School of Civil Aviations worldwide with its human resources, available equipment and facilities; and aforementioned attributes.

Dean : Prof. Dr. Semra KURAMA  
Vice Dean : Assoc. Prof. Dr. Ayşe KÜÇÜK YILMAZ  
Vice Dean : Dr. Lecturer Savaş S. ATEŞ  
Secretary of Faculty : Recai ÇELİK

### STAFF

**Professors:** T. Hikmet KARAKOÇ, Mehmet Şerif KAVSAOĞLU, Ünver KAYNAK

**Associate Professors:** Önder ALTUNTAŞ, Özlem ATALIK, Tolga BAKLACIOĞLU, Cem ÇETEK, Muzaffer ÇETİNGÜÇ, Ender GEREDE, Kürşad Melih GÜLEREN, Ayşe KÜÇÜK YILMAZ, Hakan OKTAL, Ferhan ŞENGÜR, Dilek TURAN, Önder TURAN, Enis Turhan TURGUT, Öznur USANMAZ

**Faculty Members:** Müge ARMATLI KAYRAK, Savaş S. ATEŞ, Fulya AYBEK, Ünal BATTAL, Ali Ozan CANARSLANLAR, Ertan ÇINAR, Vildan DURMAZ, Hülya ERGÜL, Nalan ERGÜN, Yasemin IŞIK, Sinem KAHVECİOĞLU, Nevzet KAYA, Emre KIYAK, Hakan KORUL, Gamze ORHAN, İlkay ORHAN, Uğur ÖZDEMİR, Asuman ÖZGER, Ali Emre SARILGAN, Özlem ŞAHİN, Yusuf ŞENGÜR, Orkun TUNÇKAN, Uğur TURHAN, Alper ULUDAĞ, Suat USLU, Gülay ÜNAL, Kadriye YAMAN, A. Akile YILDIRIM

**Lecturers:** Füsün ADAR, Hakan AYDEMİR, Sema BATTAL, Tulga Metin CANDAŞ, Gökhan DURMUŞ, Gülcan GÜNAY, M. Selçuk İRDE, Ramazan KALE, Nihat KARAGÖZ, Sema KUTLU, Hasan LİK, Osman ODABAŞI, Erkan ORMAN, Mustafa ÖZEN, Hasan TİFTİK, Ebru YAZGAN, Nilgün YILDIRIM

**Research Assistants:** Caner ACARBAY, Şahap AKAN, Hakkı AKSOY, Ersin AKTAŞ, Abdulkadir ALICI, Veysi ASKER, Vehbi Emrah ATASOY, Ramazan ATILGAN, Murat AYAR, Süleyman Kağan AYAZ, Emre AYDIN, Emre AYDOĞAN, Hakan AYĞÜN, Batuhan BALLI, Ümrhan BAYRAK, Kübra Gülnaz BÜLBÜL, Demet CANPOLAT, Eşref ÇAKIR, Ramazan Kürşat ÇEÇEN, Mehmet Emin ÇILGIN, Soner DEMİREL, Ümit DOĞAN, Kadir DÖNMEZ, Mehmet Şahin DURAK, Emrah DURMAZ, Ozan DURMAZ, Selçuk EKİCİ, Ahmet ERMEYDAN, Orhan Ertuğrul GÜÇLÜ, İlkay GÜMÜŞBOĞA, Tarık GÜNEŞ, Onur GÜNEY, Cemal IŞILAK, Aziz KABA, Zekeriya KAPLAN, Barış KARABAYRAK, Uğur KILIÇ, Ahmet KÖSE, Atilla ONRAT, Onur ÖNAL, Emircan ÖZDEMİR, Mustafa ÖZDEMİR, Metin ÖZGÜR, Zafer ÖZNALBANT, Muhammed POLAT, Hasan SARİBAŞ, Tamer SAVAŞ, Ahmet Esat SÜZER, Gökhan TANRIVERDİ, Ali TATLI, Temel Caner USTAÖMER, Mustafa UYANIK, Mustafa UZGÖR, İlker ÜNDER, Ahmet VERAL, Görkem YALIN, Muhammet YILANLI, Ece YURDUSEVİMLİ, Emre YÜCA

## DEPARTMENT OF AIR TRAFFIC CONTROL

In this department, air traffic controllers are trained according to the International Civil Aviation Organization and EUROCONTROL standards in order to ensure safe, effective and orderly air traffic flow. In our country, it is the first and only department offering undergraduate education in the field of air traffic control. Besides the theoretical courses, the students are trained at air traffic control radar simulator, airport control simulator, and flight procedures design laboratory for applications. Furthermore, the air traffic control services conducted at Anadolu University's Airport offers education in real air traffic environment to the students.

Every academic year, fifteen students are accepted to the Air Traffic Control Department by preliminary registration followed by a special aptitude test. In the department, one year of Intensive English Language education is followed by four years of undergraduate education. There is a requirement of internship for the students: First, ten workdays of internship at the School of Civil Aviation simulation laboratories; followed by an additional twenty workdays of internship at the air traffic control units; adding up to thirty workdays of internship. The graduates work at the Air Traffic Control Units of the General Directorate of State Airports.

Head : Assoc. Prof. Dr. Öznur USANMAZ

Deputy Head : Dr. Lecturer Ertan ÇINAR

Deputy Head : Dr. Lecturer Özlem ŞAHİN

### PROGRAM

I. SEMESTER				II. SEMESTER			
HTK 101	Aircraft Basic Knowledge	4+0	7,0	BİL 150	Fundamentals of Information Technology	4+0	5,0
HTK 103	Air Traffic Services	4+0	5,5	HTK 104	Aerodrome Control Procedures	5+0	6,0
HTK 105	Introduction to Air Traffic Control	2+0	3,0	HTK 205	Communication and Navigation Systems	3+0	6,0
MAT 119	Mathematics I	3+1	5,0	MAT 120	Mathematics II	3+1	4,0
SHU 102	Meteorology	3+0	5,5	MEK 110	Mechanics for Air Traffic Control	3+0	3,0
İNG 117 (Eng)	English Speaking Skills I	6+0	4,0	İNG 118 (Eng)	English Speaking Skills II	6+0	4,0
			30,0		<i>Elective Course (1)</i>	-	2,0
							30,0
III. SEMESTER				IV. SEMESTER			
ARY 205	Research Methods and Presentation Techniques	3+0	3,0	HTK 220	Non-Radar Control Procedures	5+0	6,0
HYO 107	Airport and Airport Equipment	3+0	4,5	HTK 222	Aeronautical Information Management	4+0	4,5
İST 409	Mathematical and Statistical Methods in Decision Making	4+0	4,0	HTK 224	Flight Mechanics and Aircraft Performance	3+0	3,0
MAT 108	Linear Algebra and Analytic Geometry	2+0	3,0	HTK 232	Air Traffic Communication	3+0	3,0
PLT 225	Aerodynamics	3+0	3,5	HTK 234	Navigation	3+0	3,5
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
HTK 227 (Eng)	Aerodrome Control Simulation I	2+2	5,0	HTK 228 (Eng)	Aerodrome Control Simulation II	2+4	6,0
İNG 219 (Eng)	English Speaking Skills III	4+0	2,0	İNG 220 (Eng)	English Speaking Skills IV	4+0	2,0
	<i>Elective Course (1)</i>	-	3,0				30,0
			30,0				

<b>V. SEMESTER</b>			
HTK 316	Radar Control Procedures	5+0	6,0
HTK 317	Instrument Flight Procedures	4+2	8,0
HTK 323	Trajectory Analysis and Prediction	3+0	4,5
HYO 105	Air Transportation Management	3+0	3,0
HTK 325 (Eng)	Non-Radar Control Simulation	7+1	6,5
İNG 321 (Eng)	English Speaking Skills V	4+0	2,0
			30,0

<b>VI. SEMESTER</b>			
HEE 403	Aircraft Instruments	3+1	4,5
HTK 320	Human Factors in Air Traffic Control	3+0	4,0
HTK 324	Surveillance Systems	3+0	3,0
HUK 418	Air Law	2+0	2,5
HTK 326 (Eng)	Radar Approach Control Simulation	7+1	14,0
İNG 322 (Eng)	English Speaking Skills VI	4+0	2,0
			30,0

<b>VII. SEMESTER</b>			
HTK 409	Civil-Military Air Traffic Coordination	2+0	3,0
HTK 418	Airspace Organization	2+0	3,0
HTK 423	Air Traffic Flow Management	3+0	2,5
HTK 426	Safety Management in Air Traffic System	2+0	2,5
HTK 429	Development for Air Traffic Management Applications	0+4	2,5
TÜR 125	Turkish Language I	2+0	2,0
HTK 425 (Eng)	Radar Area Control Simulation	7+1	12,5
İNG 423 (Eng)	English Speaking Skills VII	4+0	2,0
			30,0

<b>VIII. SEMESTER</b>			
BİM 301	Algorithm and Programming	2+2	6,0
HTK 428	Trends, Perspectives and Visions in Air Traffic Management	2+0	3,5
HTK 430	Simulation for Air Traffic Control and Operations Applications	0+4	5,5
HTK 434	Air Traffic Management	3+0	2,5
TÜR 126	Turkish Language II	2+0	2,0
HTK 436 (Eng)	Radar Coordination Simulation	7+1	8,5
İNG 424 (Eng)	English Speaking Skills VIII	4+0	2,0
			30,0

#### **ELECTIVE COURSES**

BEÖ 155	Physical Education	2+0	2,0
KÜL 199	Cultural Activities	0+2	2,0
MÜZ 155	Turkish Folk Music	2+0	2,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
SAĞ 102	First Aid	2+0	2,5
SAN 155	Hall Dances	0+2	2,0

SER 246	Fundamentals of Ceramics	3+0	3,5
SNT 155	History of Art	2+0	2,0
SOS 155	Folkdance	2+0	2,0
SOS 312	Organizational Behavior	3+0	4,5
THU 203	Community Services	0+2	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

## **DEPARTMENT OF AIRFRAME AND POWERPLANT MAINTENANCE**

In this department, highly qualified maintenance approval personnel are educated, according to the international standards, for aviation sector. In the Department of Airframe and Powerplant Maintenance, education is offered according to European Union Standards, SHY/JAR-66 Aircraft Maintenance Personnel Regulations, and SHY/JAR-147 Aircraft Maintenance Educational Institutions Regulations. The School has the SHY Part-147 Aircraft Maintenance Education Authorization Certificate from the General Directorate of Civil Aviation of the Ministry of Transportation. Besides the theoretical courses, students get education tailored to application in the Aerodynamics, Hydraulic Systems, Material Science, CAD/CAM, Computer laboratories; Airframe, Powerplant, Test Cell Workshops and JAR-145 certified maintenance facilities.

Every academic year, 45 students are accepted by centralized nationwide entry examinations. In the department, one year of Intensive English Language education is followed by four years of undergraduate education. 80 workdays of internship is required.

The graduates work at Turkish Airlines, Turkish Air Force Air Supply and Maintenance Centers, private airline companies, and at the technical departments of other companies operating in the aviation sector.

Head : Prof. Dr. Mehmet Şerif KAVSAOĞLU

Deputy Head : Assoc. Prof. Dr. Önder ALTUNTAŞ

Deputy Head : Dr. Lecturer İlkay ORHAN

## PROGRAM

### I. SEMESTER

FİZ 105	Physics I	4+0	6,0	
FİZ 107	Physics Laboratory I	0+2	1,5	
MAT 801	Mathematics I	4+0	4,0	
MAT 803	Linear Algebra	3+0	3,0	
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	
TRS 211	Technical Drawing and Standards	2+2	4,0	
TÜR 125	Turkish Language I	2+0	2,0	
UGB 103	Theory of Flight	4+0	4,5	
	<i>Foreign Language Courses (1)</i>	-	3,0	
			30,0	

### II. SEMESTER

BİL 150	Fundamentals of Information Technology	4+0	5,0	
FİZ 104	Waves and Optics	4+0	4,0	
HYO 225	Aircraft Maintenance Terminology I	3+0	4,0	
MAT 802	Mathematics II	4+0	4,0	
TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0	
TÜR 126	Turkish Language II	2+0	2,0	
	<i>Elective Course (2)</i>	-	6,0	
	<i>Foreign Language Courses (1)</i>	-	3,0	
			30,0	

### III. SEMESTER

HYO 108	Aircraft Materials I	3+2	4,0	
HYO 112	Aviation Legislation	4+0	3,0	
HYO 115	Introduction to Civil Aviation	2+0	3,0	
HYO 221	Electrical Fundamentals I	3+0	3,0	
HYO 223	Electrical Fundamentals Laboratory I	0+2	1,5	
HYO 226	Aircraft Maintenance Terminology II	3+0	4,0	
MAT 208	Differential Equations	3+0	4,5	
MEK 112	Mechanics	3+0	3,0	
TER 203	Thermodynamics	4+0	4,0	
			30,0	

### IV. SEMESTER

HYO 216	TUSAŞ Program	5+9	15,0	
HYO 220	Aircraft Materials II	3+2	4,0	
HYO 222	Electrical Fundamentals II	3+0	3,0	
HYO 224	Electrical Fundamentals Laboratory II	0+2	1,5	
MEK 210	Fluid Mechanics	2+1	3,0	
UGB 202	Electronic Fundamentals I	2+1	3,5	
			30,0	

### V. SEMESTER

HYO 317	Aircraft Aerodynamics	3+2	5,0	
HYO 326	Aircraft Electricity Workshop	2+4	5,0	
HYO 328	Aircraft Electrical Systems	5+0	5,0	
UGB 307	Electronic Fundamentals II	2+1	4,5	
UGB 315	Gas Turbine Engine Theory	3+0	4,5	
UGB 317	Aircraft Hardware and Applications I	3+5	6,0	
			30,0	

### VI. SEMESTER

HYO 313	Electrical Machinery	3+0	3,0	
HYO 315	Electrical Machinery Laboratory	0+2	1,5	
MEK 312	Flight Mechanics	3+1	3,5	
UGB 320	Aircraft Hardware and Applications II	3+3	4,5	
UGB 322	Gas Turbine Engine Systems I	4+0	4,5	
UGB 324	Aircraft Structure and Systems I	4+1	4,0	
UGB 326	Avionic Systems	4+0	4,0	
UGB 328	Non-destructive Inspection Methods	0+3	2,0	
	<i>Elective Course (1)</i>	-	3,0	
			30,0	

### VII. SEMESTER

HYO 324	Electronic Instrument Systems	4+1	5,0	
HYO 422	Human Factors	3+0	3,0	
HYO 424	Modern Avionic Systems	3+0	3,0	
UGB 407	Aircraft Structure and Systems II	3+0	4,0	
UGB 409	Maintenance Practices	3+5	6,5	
UGB 411	Gas Turbine Engine Systems II	4+0	5,5	
	<i>Departmental Elective Course (1)</i>	-	3,0	
			30,0	

### VIII. SEMESTER

HYO 410	Applications of Powerplant-Airframe Maintenance	0+6	7,5	
HYO 420	Electromagnetic Environment	2+0	2,5	
UGB 412	Aircraft Structure and Systems III	3+0	3,0	
UGB 414	Flight Controls	3+0	3,0	
UGB 416	Fuel Systems of Gas Turbine Engines in Aircraft	3+0	3,5	
UGB 420	Propeller	3+0	4,0	
UGB 426	Gas Turbine Engine Workshop	0+8	3,5	
	<i>Departmental Elective Course (1)</i>	-	3,0	
			30,0	

**DEPARTMENTAL ELECTIVE COURSES**

BİL 257 (Eng)	Computer Programming	2+2	4,5
HYO 105	Air Transportation Management	3+0	3,0
HYO 304	Aircraft Manufacturing Technologies	3+0	3,5
HYO 406	Helicopter Theory and Systems	3+0	4,5
HYO 411	Vibration Analysis in Aircrafts	2+1	3,0
HYO 413 (Eng)	Aircraft Systems Design	2+2	4,5
HYO 415	Academic and Technological Progresses in Aviation	3+0	3,0
HYO 416	Reciprocating Engine Theory, Systems and Maintenance	3+0	3,0
HYO 426	Ergonomics in Aviation	2+1	3,0
HYO 428	Aviation Meteorology	3+0	3,0
SHU 424	Aircraft Maintenance and Reliability Management	3+0	3,0
UGB 408	Fracture Mechanics	3+0	3,0
UGB 413	Non-destructive Inspection Methods	3+0	4,5
UGB 422	Environmental Impact Assessment in Aviation	3+0	4,5
UGB 424	Reciprocating Engines	1+3	3,0
UGB 425	Aircraft Maintenance Practices M11	0+5	4,5
UGB 428	Aircraft Maintenance Practices M7	0+4	4,5
UGB 430	Aircraft Maintenance Practices M17	0+4	3,0
UMB 407	Heat Transfer and Aircraft Engine Applications	3+0	3,0

UMB 452	The Application of Gas Turbine's for Cogeneration	3+0	4,5
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**ELECTIVE COURSES**

BEÖ 155	Physical Education	2+0	2,0
BİL 303	Visual Programming	3+0	3,0
HYO 113	Aviation History	2+0	2,0
HYO 334	Sustainable Aviation Technologies	2+0	2,0
İLT 307	Communication	3+0	3,0
KÜL 199	Cultural Activities	0+2	2,0
MÜZ 155	Turkish Folk Music	2+0	2,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
SAĞ 102	First Aid	2+0	2,5
SAN 155	Hall Dances	0+2	2,0
SER 246	Fundamentals of Ceramics	3+0	3,5
SNT 155	History of Art	2+0	2,0
SOS 155	Folkdance	2+0	2,0
SOS 312	Organizational Behavior	3+0	4,5
THU 203	Community Services	0+2	3,0
TKY 304 (Eng)	Quality Assurance Systems	2+0	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

**FOREIGN LANGUAGE COURSES**

İNG 187 (Eng)	English I	3+0	3,0
İNG 188 (Eng)	English II	3+0	3,0
İNG 325 (Eng)	Academic English III	3+0	3,0
İNG 326 (Eng)	Academic English IV	3+0	3,0

**DEPARTMENT OF AVIATION ADMINISTRATION**

In this department, highly qualified personnel in the field of management demanded by government and private institutions operating in the aviation sector is educated according to international requirements. Professional courses such as Air Transportation Management, Aviation Management, Airport Management, Operational Performance, Aviation Safety and Security; theoretical management courses such as Financial Management, Marketing, Human Resource Management, Logistics; and, IATA certified courses providing certificates such as Ground Handling, Passenger Handling Services, Air Cargo, and Dangerous Goods take part in the curriculum of the Department of Air Transportation Management.

Every academic year, 40 students are accepted by centralized nationwide entry examinations. In the department, one year of Intensive English Language education is followed by four years of undergraduate education. 40 workdays of internship is required.

The graduates work at Turkish Airlines, private airline companies, airports, airport ground services, catering and cargo shipping companies and other aviation institutions.

Head : Assoc. Prof. Dr. Özlem ATALIK  
Deputy Head : Dr. Lecturer Nalan ERGÜN  
Deputy Head : Dr. Lecturer Ali Emre SARILGAN

## PROGRAM

<b>I. SEMESTER</b>				<b>II. SEMESTER</b>			
HUK 153	Fundamentals Concepts of Law	2+0	3,0	BİL 150	Fundamentals of Information Technology	4+0	5,0
İKT 153	Economics I	3+0	4,5	İKT 154	Economics II	3+0	4,5
İŞL 101	Introduction to Business	3+0	4,5	MAT 172	Mathematics II	2+0	3,0
MAT 129	Mathematics I	2+0	4,0	SHU 103	Flight Theory	2+0	3,5
MUH 151	Introduction to Accounting	3+0	4,5	SHU 108	Air Transportation	3+0	3,0
SHU 101	Introduction to Civil Aviation	2+0	3,5	SHU 110	Meteorology	3+0	3,0
İNG 127 (Eng)	English I	4+0	4,0	İNG 128 (Eng)	English II	4+0	4,0
	<i>Elective Course (1)</i>	-	2,0		<i>Departmental Elective Course (1)</i>	-	4,0
			30,0				30,0
<b>III. SEMESTER</b>				<b>IV. SEMESTER</b>			
İŞL 102	Management and Organization	3+0	4,0	SHU 236	Flight Performance	2+0	3,0
SHU 213	Flight Operations	3+0	4,5	SHU 238	Aviation Security	2+0	4,0
SHU 217	Airport Operations and Equipment	3+0	4,0	SHU 242	Operation and Performance I	4+0	4,0
SHU 219	Navigation and Navigation of Aids	3+0	4,0	SHU 244	Ground Handling I	4+0	3,0
SOS 107	Behavioral Sciences	2+0	3,0	TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	TÜR 126	Turkish Language II	2+0	2,0
TÜR 125	Turkish Language I	2+0	2,0	İNG 230 (Eng)	English IV	4+0	4,0
İNG 229 (Eng)	English III	4+0	3,5		<i>Departmental Elective Course (2)</i>	-	8,0
	<i>Departmental Elective Course (1)</i>	-	3,0				30,0
			30,0				
<b>V. SEMESTER</b>				<b>VI. SEMESTER</b>			
FİN 202	Financial Management	3+0	4,5	İŞL 417	Management Information Systems	3+0	4,5
PZL 302	Marketing Management	3+0	4,5	SHU 302	Airline Management	3+0	4,5
SHU 301	Production Management in Service Companies	3+0	4,5	SOS 312	Organizational Behavior	3+0	4,5
İNG 307 (Eng)	Aviation English I	4+0	5,0	İNG 308 (Eng)	Aviation English II	4+0	5,0
	<i>Departmental Elective Course (3)</i>	-	11,5		<i>Departmental Elective Course (2)</i>	-	9,0
			30,0		<i>Elective Course (1)</i>	-	2,5
							30,0
<b>VII. SEMESTER</b>				<b>VIII. SEMESTER</b>			
NÜM 305	Quantitative Methods	3+0	4,5	HUK 418	Air Law	2+0	2,5
SHU 403	Finance in Aviation Companies	3+0	4,5	PZL 410	Airline Marketing	2+0	3,0
SHU 404	Airport Management	3+0	4,5	SHU 412	Airline Fleet Planning	2+0	3,0
SHU 405	Aviation Safety	3+0	4,5	SHU 416	Aircraft Maintenance Management	2+0	3,0
SHU 409	Enterprise Resource Management	3+0	4,5	İNG 402 (Eng)	Advanced English II	4+0	3,0
İNG 401 (Eng)	Advanced English I	4+0	3,0		<i>Departmental Elective Course (3)</i>	-	12,5
	<i>Departmental Elective Course (1)</i>	-	4,5		<i>Elective Course (1)</i>	-	3,0
			30,0				30,0
<b>DEPARTMENTAL ELECTIVE COURSES</b>							
HUK 154	Commercial Law	2+0	3,0	HYO 451	General Aviation	3+0	3,5
HUK 252	Labor Law	2+0	2,5	İŞL 301	Human Resources Management	3+0	4,0
				İŞL 406	Strategic Management	3+0	4,5

MLY 205	Public Finance	3+0	4,5
MUH 240	Cost and Management Accounting	4+0	5,0
MUH 302	Analysis of Financial Reports	3+0	4,5
PZL 210	Customer Relations	2+0	3,0
SHU 205	Management Statistics	3+0	4,0
SHU 222	CRS Applications	3+0	4,0
SHU 232	Air Cargo	3+0	4,0
SHU 234	Flight Planning and Monitoring	3+0	4,0
SHU 240	Passenger Handling Services I	4+0	4,0
SHU 246	Dangerous Goods	4+0	4,0
SHU 304	Air Traffic Rules and Services	3+0	4,5
SHU 308	Aviation Ethics	2+0	3,0
SHU 341	Passenger Handling Services II	4+0	4,0
SHU 343	Operation and Performance II	4+0	5,0
SHU 345	Ground Handling II	4+0	2,5
SHU 426	Transportation Policies	2+0	3,5
SHU 498	Applications of Civil Aviation Management	0+6	6,0

### ELECTIVE COURSES

BEÖ 155	Physical Education	2+0	2,0
İKT 420	European Union and Turkey	2+0	3,0
İŞL 352	Organizational Communication	2+0	3,0
KÜL 199	Cultural Activities	0+2	2,0
MÜZ 155	Turkish Folk Music	2+0	2,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
SAN 155	Hall Dances	0+2	2,0
SHU 111	Sustainability in Airport Operations	2+0	2,0
SHU 428	Logistics Management	2+0	3,0
SHU 430	Project Management	2+0	3,5
SHU 432	Innovation Management	2+0	3,5
SHU 434	Planning and Scheduling of Airline Operations	2+0	3,0
SNT 155	History of Art	2+0	2,0
SOS 155	Folkdance	2+0	2,0
THU 203	Community Services	0+2	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

## DEPARTMENT OF AVIONICS

In this department, highly qualified maintenance approval personnel are educated, according to the international standards, for aviation sector. In the Department of Avionics, education is offered according to European Union Standards, SHY/JAR-66 Aircraft Maintenance Personnel Regulations, and SHY/JAR-147 Aircraft Maintenance Educational Institutions Regulations. The School has the SHY Part-147 Aircraft Maintenance Education Authorization Certificate from the General Directorate of Civil Aviation of the Ministry of Transportation. Besides the theoretical courses, students get education tailored to the application in the Avionics, High Frequency, Automatic Control, DME, VOR, ILS, Computer, Basic Electricity and Electronics, Electrotechnics, Communication Systems laboratories and JAR-145 certified maintenance facilities.

Twenty-five students are accepted to the Department of Avionics by centralized nationwide placement examinations. In the department, one year of Intensive English Language education is followed by four years of undergraduate education. Eighty workdays of internship is required.

The graduates work at Turkish Airlines, Turkish Air Force Air Supply and Maintenance Centers, private airline companies, and at the technical departments of other companies operating in the aviation sector.

Head : Dr. Lecturer Gülay ÜNAL  
Deputy Head : Dr. Lecturer Sinem KAHVECİOĞLU  
Deputy Head : Dr. Lecturer Emre KIYAK

### PROGRAM

I. SEMESTER				II. SEMESTER			
FİZ 105	Physics I	4+0	6,0	BİL 150	Fundamentals of Information Technology	4+0	5,0
FİZ 107	Physics Laboratory I	0+2	1,5	FİZ 104	Waves and Optics	4+0	4,0
HEE 105	Theory of Flight	3+0	3,5	HYO 108	Aircraft Materials I	3+2	4,0
HYO 115	Introduction to Civil Aviation	2+0	3,0	HYO 112	Aviation Legislation	4+0	3,0
MAT 801	Mathematics I	4+0	4,0	MAT 802	Mathematics II	4+0	4,0
MAT 803	Linear Algebra	3+0	3,0	MEK 112	Mechanics	3+0	3,0
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
	<i>Elective Course (2)</i>	-	4,0		<i>Elective Course (1)</i>	-	2,0
	<i>Foreign Language Courses (1)</i>	-	3,0		<i>Foreign Language Courses (1)</i>	-	3,0
			<u>30,0</u>				<u>30,0</u>

**III. SEMESTER**

HEE 213	Aircraft Structures and Systems I	3+1	4,0
HYO 219	Aircraft Materials II	2+2	3,0
HYO 221	Electrical Fundamentals I	3+0	3,0
HYO 223	Electrical Fundamentals Laboratory I	0+2	1,5
HYO 225	Aircraft Maintenance Terminology I	3+0	4,0
MAT 208	Differential Equations	3+0	4,5
TER 203	Thermodynamics	4+0	4,0
TRS 211	Technical Drawing and Standards	2+2	4,0
TÜR 125	Turkish Language I	2+0	2,0
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			30,0

**IV. SEMESTER**

HEE 214	Aircraft Structures and Systems II	2+0	2,0
HEE 218	Communication Systems I	3+1	3,5
HEE 220	Digital Data Transmission	3+1	3,5
HEE 222	Non-destructive Inspection	0+2	2,0
HEE 224	Electronic Fundamentals I	3+0	4,0
HEE 226	Electronic Fundamentals Laboratory I	0+2	1,5
HYO 222	Electrical Fundamentals II	3+0	3,0
HYO 224	Electrical Fundamentals Laboratory II	0+2	1,5
HYO 226	Aircraft Maintenance Terminology II	3+0	4,0
MEK 210	Fluid Mechanics	2+1	3,0
TÜR 126	Turkish Language II	2+0	2,0
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			30,0

**V. SEMESTER**

HEE 313	Aircraft Hardware	2+3	4,0
HEE 315	Aircraft Structures and Systems III	2+0	2,0
HEE 317	Electronic Fundamentals II	3+1	4,0
HEE 319	Digital Circuits I	2+2	3,5
HEE 325	Maintenance Practices I	2+4	4,0
HYO 313	Electrical Machinery	3+0	3,0
HYO 315	Electrical Machinery Laboratory	0+2	1,5
HYO 317	Aircraft Aerodynamics	3+2	5,0
	<i>Elective Course (1)</i>	-	3,0
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			30,0

**VI. SEMESTER**

HEE 316	Navigation Systems I	4+0	5,0
HEE 318	Electronic Fundamentals III	2+0	3,0
HEE 320	Digital Circuits II	2+1	3,5
HYO 324	Electronic Instrument Systems	4+1	5,0
HYO 326	Aircraft Electricity Workshop	2+4	5,0
HYO 328	Aircraft Electrical Systems	5+0	5,0
MEK 312	Flight Mechanics	3+1	3,5
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			30,0

**VII. SEMESTER**

HEE 421	Communication Systems II	3+0	3,0
HEE 423	Navigation Systems II	3+0	3,0
HEE 425	Microprocessors	3+2	4,5
HEE 427	Troubleshooting Methodology	2+0	2,0
HEE 429	Aircraft Instrument Systems I	3+1	4,0
HEE 431	Gas Turbine Engines	3+0	4,0
HEE 433	Flight Controls	2+0	2,5
HEE 435	Automatic Flight Systems	4+0	4,0
	<i>Departmental Elective Course (1)</i>	-	3,0
			<hr/>
			30,0

**VIII. SEMESTER**

HEE 428	Maintenance Practices II	2+4	4,5
HEE 430	Aircraft Instrument Systems II	3+0	3,0
HEE 432	Gas Turbine Engines Workshop	0+3	2,0
HEE 498	Applications of Avionics	0+6	7,5
HYO 420	Electromagnetic Environment	2+0	2,5
HYO 422	Human Factors	3+0	3,0
HYO 424	Modern Avionic Systems	3+0	3,0
	<i>Departmental Elective Course (1)</i>	-	4,5
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			30,0

**DEPARTMENTAL ELECTIVE COURSES**

BİL 257 (Eng)	Computer Programming	2+2	4,5
HEE 305 (Eng)	Microwave Theory	2+2	4,5
HEE 405 (Eng)	Distance Measuring Equipment	2+2	4,5
HEE 406 (Eng)	Instrument Landing System/VHF Omni Range	2+2	4,5
HEE 419	Maintenance and Repair in Aircraft Electric Systems	2+1	4,5
HEE 434 (Eng)	Automatic Control	2+2	4,5
HEE 439	Maintenance Practices-M13 I	0+7	4,5
HEE 440	Maintenance Practices-M13 II	0+3	3,0
HEE 441	Maintenance Workshop Applications-M13 I	0+5	3,0

HEE 442	Maintenance Workshop Applications-M13 II	0+5	4,5
HYO 105	Air Transportation Management	3+0	3,0
HYO 406	Helicopter Theory and Systems	3+0	4,5
HYO 411	Vibration Analysis in Aircrafts	2+1	3,0
HYO 413 (Eng)	Aircraft Systems Design	2+2	4,5
HYO 416	Reciprocating Engine Theory, Systems and Maintenance	3+0	3,0
HYO 426	Ergonomics in Aviation	2+1	3,0
HYO 428	Aviation Meteorology	3+0	3,0
SHU 424	Aircraft Maintenance and Reliability Management	3+0	3,0



**ELECTIVE COURSES**

BEÖ 155	Physical Education	2+0	2,0
BİL 303	Visual Programming	3+0	3,0
HEE 322	Unmanned Aerial Vehicle Design, Control Systems and Workshop Applications	2+2	4,5
HYO 113	Aviation History	2+0	2,0
İLT 307	Communication	3+0	3,0
KÜL 199	Cultural Activities	0+2	2,0
MÜZ 155	Turkish Folk Music	2+0	2,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
SAĞ 102	First Aid	2+0	2,5
SAN 155	Hall Dances	0+2	2,0

SER 246	Fundamentals of Ceramics	3+0	3,5
SNT 155	History of Art	2+0	2,0
SOS 155	Folkdance	2+0	2,0
THU 203	Community Services	0+2	3,0
TKY 304	Quality Assurance Systems	2+0	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

**FOREIGN LANGUAGE COURSES**

İNG 187	(Eng) English I	3+0	3,0
İNG 188	(Eng) English II	3+0	3,0
İNG 325	(Eng) Academic English III	3+0	3,0
İNG 326	(Eng) Academic English IV	3+0	3,0

**DEPARTMENT OF FLIGHT TRAINING**

In this department, highly qualified pilots are educated, according to the international standards, for aviation sector. In our country, it is the first and only department offering undergraduate education in the field of flight training. After the training conducted according to the standards of International Civil Aviation Organization, ICAO, European Aviation Standard JAR-FCL and national requirements, the students can be graduated as pilots having ATP(A) credit and CPL(A)/IR(A) license. Students starting their education, receive theoretically based ground training in the first 3 semesters (one and a half year). Following that, they receive their flight training in general purpose flight simulators and 8 SOCATA TB 20 TRINIDAD, 5 CESSNA 172SP, 2 BEECH CRAFT C90 GTI a fleet of 15 airplanes consisting of different types.

Every academic year, 15 students are accepted to the Flight Training Department by preliminary registration followed by a special aptitude test. In the department, one year of Intensive English Language education is followed by four years of undergraduate education. Twenty workdays of internship is required.

The graduates work at Turkish Airlines, Private airline companies, air-taxi companies, and at flight training schools.

**PROGRAM**

<b>1. PERIOD / 1. PHASE</b>				<b>1. PERIOD / 2. PHASE</b>			
FİZ 119	Aeronautical Physics I	3+0	3,0	BİL 150	Fundamentals of Information Technology	4+0	5,0
HUK 147	Air Law I (International Agreements and Aerodromes)	2+0	2,5	FİZ 120	Aeronautical Physics II	3+0	3,0
İNG 119	(Eng) Aviation English I	6+0	4,0	İNG 120	(Eng) Aviation English II	6+0	4,0
MAT 168	Mathematics	4+2	5,5	PLT 114	Aircraft General Knowledge I (Airframe and Systems)	3+0	4,0
PLT 113	Principles of Flight	4+0	3,5	PLT 118	Meteorology II	2+0	3,0
PLT 115	Safety Management System I	2+0	1,5	PLT 120	Aircraft General Knowledge II (Electrics)	1+0	1,0
PLT 117	Meteorology I	4+0	4,0	PLT 122	Flight Operations	3+0	3,0
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	PLT 239	Aircraft General Knowledge III (Aircraft Engines)	2+0	3,0
TÜR 125	Turkish Language I	2+0	2,0	TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
	<i>Elective Course (1)</i>	-	2,0	TÜR 126	Turkish Language II	2+0	2,0
			30,0				30,0
<b>1. PERIOD / 3. PHASE</b>				<b>2. PERIOD / 1. PHASE</b>			
HUK 250	Air Law II (ATC Procedures and Flight Procedures)	2+0	3,0	PLT 240	Avionics I	12+0	1,5
İNG 205	(Eng) Aviation English III	4+0	4,0	PLT 242	Normal Procedures I	18+0	1,5
				PLT 244	Emergency Procedures I	18+0	1,5

PLT 247	General Navigation	5+0	5,0	PLT 260	Introduction to Aircraft Types I	24+0	3,0
PLT 251	Human Performance and Limitations	4+0	4,5	PLT 262	VFR Navigation and Flight Planning	18+0	3,0
PLT 253	Air Traffic Communication I	2+0	4,5	PLT 264	Standard Operation Procedures I	30+0	2,5
PLT 255	Aircraft General Knowledge IV (Flight Instrument)	3+0	4,0	PLT 266	Safety Management System II	18+0	2,0
PLT 257	Radio Navigation I (Basic Radio Aids)	4+0	5,0	PLT 268	Practice in Flight I	0+15	3,5
				PLT 270	Practice in Flight II	0+46	7,0
				PLT 272	Practice in Flight III	0+24	4,5
			<u>30,0</u>				<u>30,0</u>

### 2. PERIOD / 2. PHASE

PLT 344	Mass and Balance	30+0	4,5
PLT 348	Performance	40+0	5,0
PLT 350	Radio Navigation II (Radar, RNAV)	28+0	5,5
			<u>15,0</u>

### 2. PERIOD / 3. PHASE

İNG 304	(Eng) Aviation English V	60+0	3,0
PLT 336	Emergency Procedures II	15+0	1,5
PLT 338	Normal Procedures II	15+0	1,5
PLT 342	Air Traffic Communication II	12+0	1,5
PLT 352	Basic Instrument	18+0	4,5
PLT 354	Radio Navigation III (FMS)	18+0	6,0
PLT 356	Flight Planning and Monitoring	48+0	7,5
PLT 358	Introduction to Aircraft Types II	24+0	3,0
PLT 360	Standard Operation Procedures II	15+0	1,5
			<u>30,0</u>

### 3. PERIOD / 1. PHASE

İNG 303	(Eng) Aviation English IV	60+0	3,0
PLT 362	Practice in Flight IV	0+20	7,0
PLT 364	Safety Management System III	12+0	1,5
PLT 366	Radio Instrument and Radio Instrument Cross Country	30+0	4,5
PLT 368	Simulator Application I	0+15	5,5
PLT 370	Practice in Flight V	0+16	6,0
PLT 387	Instrument Flight Charts	18+0	2,5
			<u>30,0</u>

### 3. PERIOD / 2. PHASE

PLT 372	Simulator Application II	0+14	4,0
PLT 374	Practice in Flight VI	0+22	6,0
PLT 388	Simulator Application III	0+8	2,0
PLT 456	Night Flight	12+0	3,0
SAĞ 401	First Aid	18+0	3,0
			<u>18,0</u>

### 3. PERIOD / 3. PHASE

PLT 422	Multy Crew Cooperation (MCC)	25+0	3,5
PLT 447	Avionics II	30+0	4,0
PLT 460	MCC Simulator Application	0+15	4,5
			<u>12,0</u>

### 3. PERIOD / 4. PHASE

PLT 462	Normal Procedures III	18+0	3,0
PLT 464	Emergency Procedures III	12+0	1,5
PLT 468	Introduction to Aircraft Types III	24+0	1,5
PLT 470	Standard Operation Procedures III	18+0	3,0
PLT 472	Practice in Flight VII	0+11	6,0
			<u>15,0</u>

### ELECTIVE COURSES

BEÖ 155	Physical Education	2+0	2,0
HYO 409	Case Studies in Aviation Safety	2+0	3,0
KÜL 199	Cultural Activities	0+2	2,0
MÜZ 155	Turkish Folk Music	2+0	2,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
SAN 155	Hall Dances	0+2	2,0

SNT 155	History of Art	2+0	2,0
SOS 155	Folkdance	2+0	2,0
THU 203	Community Services	0+2	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

## COURSE CONTENTS

### **ARY 205 Research Methods and Presentation Techniques** 3+0 3,0

Research Methods and Presentation Techniques: Definition, Variations and Phases of Research; Definition of Data and Data Collection Techniques; Report Writing Techniques; Writing Styles; Academic Ethics in Citations; Preparation for Presentation and Methods of Presentation Planning; Presentation and Interaction; Summarizing and Feedback

### **BEÖ 155 Physical Education** 2+0 2,0

Definition of Physical Education and Sports; Aims, Disadvantages of Inactive Life; Various Activities for Physical Education; Recreation; Human Physiology; First Aid; Sports Branches: Definition, Rules and Application; Keep Fit Programs.

### **BİL 150 Fundamentals of Information Technology** 4+0 5,0

Introduction to Computer: History of Computer; Operating Systems: Introduction to operating systems; Office Software-Word Processors and Document Systems: General Characteristics of the Office Software; Office-Software-Spreadsheets Programs: Spreadsheets Programs; Office Software-Presentation Programs: Presentation Programs; E Mail-Personal Communication Management: General Characteristics of the E Mailing System; Effective use of the Internet and Internet Security; Network Technologies. Computer Hardware and Error Detection: Types of Computers; Social Networks and Social Media: Social Media and Introduction to Social Media; Special Application Software: Multimedia; Law and Ethics of Informatics: Intellectual Property and Informatics Law; E-Learning: Developments in E-Learning; E-Government Applications; Computer and Network Security; Latest Strategic Technologies of Informatics: Factors Affecting Technological Developments.

### **BİL 257 Computer Programming** 2+2 4,5

Analysis of a C Program; Keywords; Variables, Constants and declaring a function or an array; Data Types Used in C; Operators and Precedence; Declaration of Data; Basic I/O Statements: Getchar(), Getch(), Getche(), Putchar(), Gets(), Puts(), Printf(), Scanf(); Loop Statements: For, While, Do-While; Decision Statements: If-Else, Switch, Case; Strings and Arrays: One dimensional arrays, Multidimensional arrays; Pointers; Character Strings; Functions; Term Project.

### **BİL 303 Visual Programming** 3+0 3,0

Introduction to programming: Variables, Data types, Data type conversions, Operators; Fundamentals of Visual Programming: Forms, Modules, Subs and Functions; General commands: Loops, if/else, do/while loop structures: Control and form applications; Folder and files; Arrays; Fundamentals of Visual Basic Applications; Excel Application with VBA; Database applications; .txt and .xls based database applications; Project homework.

### **BİM 301 Algorithm and Programming** 2+2 6,0

Basic Concepts: Algorithm, Programming; Installing and Configuring Visual Studio; Control Elements: Textbox, Labels, Command Button, Checkbox, Scroll-Bars, Timer Control, Frame Control, Option Button, Picture-Box, Combo-Box, Drive List Box, Directory List Box, File List Box, Common Dialogs, Date-Time-Picker; Data Types: Char, Integer, String, Float; Text Events: Importing Text, Click, Double-Click, Got-Focus, Change, On Mouse Over; Making Functions; Debugging.

### **FİN 202 Financial Management** 3+0 4,5

Definition and Aim of Financial Management in Firms; Using Ratios, Breakeven and Operating Leverage in Financial Analysis; Fund Flow Statement; Pro forma Budget as Instrument of Financial Planning; Working Capital Management; Cash Management; Inventory Management; Interest Factor in Investment Decisions; Capital Budgeting; Debt Management; Using Other Financial Instruments; Cost of Capital.

### **FİZ 104 Waves and Optics** 4+0 4,0

Nature of Light; Speed of Light; Simple Harmonic Motion: Period, Frequency and Force constant; Laws of Reflection and Refraction: Huygens principle, Reflection at plane surfaces, Reflection by spherical mirrors, Refraction, Lenses; Fibre Optics; Wave Motion: Mechanical waves, Sinusoidal wave motion, Interference phenomena, Standing waves; Sound: Speed of sound, Production of sound, Intensity, Pitch and quality, Doppler effect.

### **FİZ 105 Physics I** 4+0 6,0

Measurement and Units: Measurement, Units, Dimensional analysis; Vectors: Vector and scalar quantities, Coordinate systems and frames of reference; Kinematics: Motion in one dimension, Motion in two dimensions; Dynamics; Work and Energy; Momentum and Collisions; Rotational Motion: Angular velocity and angular acceleration, Moments of inertia, Work and energy in rotational motion; Static Equilibrium.

### **FİZ 107 Physics Laboratory I** 0+2 1,5

SI Unit System and Dimension Analysis; Measurement and Error Calculations; Graph Analysis; Principles of Experimental Studying and Preparation of Experimental Reports; Variation of Range due to Shooting Angle; Conservation of Energy; Motion with Constant Acceleration; Measurement of Angular Velocity; Determination of Moment of Inertia; Freely Falling; Simple Pendulum; Motion on Inclined Plane; Mass-spring System; Viscosity.

### **FİZ 119 Aeronautical Physics I** 3+0 3,0

Vector: Coordinate systems, components of vector, mathematical process; Motion: Displacement, velocity, acceleration, free fall, inclined projectile motion, circular motion, Newton's Laws, relative motion; Work, Power, Energy: Work-Energy theorem, conservation of mechanical

energy; Momentum and Collision: Conservation, impuls, collusion; Rotation: Angular velocity and acceleration, kinematics, moment of inertia angular momentum, torque; Fundamental physics of Solar System: Formation, stars, orbital dynamics, Kepler's laws; Sky analysis: concepts of fundamental astronomy, models of universe, fundamental components of universe, star map, space-time analysis; Earth: Formation, geometric-geomagnetic-motional-atmospheric properties; Spherical systems.

**FİZ 120 Aeronautical Physics II** 3+0 3,0

Electrical charge: Electrical properties of matter, Coulomb; Gauss's law; Electrical Potential: Analysis of charge; Capacitor: Capacitance circuit analysis; Current and Resistance: Ohm's law, circuits, electromotive force, Kirchhoff; Magnetic Fields: Biot-Savart, Ampere; Faraday's law: Induction, Lenz, mutual inductance; Spherical trigonometry: Spherical distance, surface, angular distance analysis; Localization, feature of map, scale, projection; Remote Sensing: Satellites, the wave theory of electromagnetic and light analysis, satellite image and aerial photo analysis; Positional Modeling: Fundamental components of digital maps, rectification, to assign a position, 2D and 3D digital data production, questioning, analysing and modelling with interactive data base.

**HEE 105 Theory of Flight** 3+0 3,5

Aeroplane Aerodynamics: Aerostatics, Aerodynamics, Basic forces affecting aeroplane, Wing section, Boundary layer control, Stall; Flight Control Surfaces: Aileron, Spoiler, Elevator, Stabilator, Variable incidence stabiliser, Canard configuration, Elevon, Taileron; Rudder, Rudder limiters, Ruddervator, Tabs, Control surface bias, High lift devices (trailing edge flaps, leading edge flaps, slot, slat, flaperon), Airbrakes, Ground spoiler; High Speed Flight: Speed of sound, Subsonic, transonic, supersonic flight, Mach number, Critical Mach number; Rotary Wing Aerodynamics: Basic terminology.

**HEE 213 Aircraft Structures and Systems I** 3+1 4,0

Structures-General Concepts: Fundamentals of structural systems, Zonal and station identification system, Electrical bonding, Lightning strike protection; Hydraulic Power: System lay-out, Hydraulic fluids, Hydraulic reservoirs and accumulators, Pressure generation (electrical, mechanical, pneumatic), Emergency pressure generation, Filters, Pressure control, Power distribution, Indication and warning systems, Interface with other systems; Landing Gear: Construction, Shock absorbing, Extension and retraction systems (normal and emergency), Indications and warnings, Wheels, Brakes, Antiskid and autobraking, Tires, Steering, Air-ground sensing.

**HEE 214 Aircraft Structures and Systems II** 2+0 2,0

Air Conditioning and Cabin Pressurisation: Air supply, Air conditioning system, Pressurisation systems; Safety and warning devices; Oxygen System: Flight crew oxygen system, Passenger oxygen system, Portable oxygen system; Pneumatic/Vacuum System: System lay-out, System sources, User system, Component location, Distribution,

Indications and warnings; Water/Waste System: Supply, Distribution, Water heaters, Draining system, Indicators.

**HEE 218 Communication Systems I** 3+1 3,5

Introduction to Communication Systems; Communication Fundamentals: Noise, Sampling theorem, Filters, Oscillators; Amplitude modulation: Mathematical expression of AM, Generation of AM; Single Side Band Techniques: Definition of SSB and modulation techniques; Angle Modulation: Angle modulation theorem, Frequency modulation, Mathematical expression, Wave spectrum, Modulation methods, Comparison of FM and AM; Radio Receivers: Types of receiver, AM receivers, FM receivers; Digital Modulation: Definition, Types of modulation and methods (PAM, PCM, TDM); Antennas; Transmission lines.

**HEE 220 Digital Data Transmission** 3+1 3,5

Data Conversion: Analogue data, Digital data, Practice with analogue to digital, and digital to analogue converters, Inputs and outputs, Conversion limitations; Data Buses: Operation of data buses in aircraft systems, ARINC and other specifications; Aircraft Network/Ethernet; Fiber Optics: Advantages and disadvantages of fiber optic data transmission over electrical wire propagation, Fiber optic data bus; Fiber optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fiber optics in aircraft systems.

**HEE 222 Non-destructive Inspection** 0+2 2,0

Non-destructive Inspection Methods: Liquid penetrant inspection methods and types of penetrants, Radiographic inspection, Radiographic X-ray film evaluation and archiving, Application steps of magnetic particle inspection methods, Eddy current inspection and probe types, Ultrasonic inspection methods and application techniques, Visual and optical inspection, Boroscope control.

**HEE 224 Electronic Fundamentals I** 3+0 4,0

Semiconductors, p and n type materials; Diodes; Diodes in series and parallel; Application of Diodes: Operation and function of diodes in the following circuits clippers, clampers, rectifiers, voltage multipliers; Other semiconductor devices: Main characteristics and use of thyristor, light emitting diode, photo conductive diode, varistor, rectifier diodes; Transistors: Transistor characteristics and properties, Construction and operation of pnp and npn transistors; Base, collector and emitter configurations; Transistor biasing circuits; Application of transistors: Switching Circuits, Amplifiers; AC Analysis of Small Signal Amplifiers and Power Amplifiers.

**HEE 226 Electronic Fundamentals Laboratory I** 0+2 1,5

Semiconductors, p and n type materials; Diodes; Diodes in series and parallel; Application of Diodes: Operation and function of diodes in the following circuits clippers, clampers, rectifiers, voltage multipliers; Other semiconductor devices: Main characteristics and use of thyristor, light emitting diode, photo conductive diode, varistor, rectifier diodes; Transistors: Transistor

characteristics and properties, Construction and operation of pnp and npn transistors; Base, collector and emitter configurations; Transistor biasing circuits; Application of transistors: Switching Circuits, Amplifiers; AC Analysis of Small Signal Amplifiers and Power Amplifiers.

**HEE 305 Microwave Theory** 2+2 4,5

Electromagnetics Fundamentals: Definition of electromagnetic waves and electromagnetic wave propagation; Transmission Lines: Characteristic impedance, Propagation velocity and Velocity factor, Standing waves, Reflection coefficient; Smith Chart; Microwave Transmission Lines: Two-wire lines and coaxial cables, Waveguides; Passive Microwave Components: Connectors, Attenuators, Isolators, Filters; Active Microwave Components: Velocity modulation, Klystron oscillators and amplifiers, Magnetron; Antennas: Antenna types and arrays; Microwave Measurements: Noise, Frequency and Power measurements, VSWR measurement.

**HEE 313 Aircraft Hardware** 2+3 4,0

Fasteners: Screw threads, Screw nomenclature, Thread forms, Dimensions, Tolerances, Measurements, Bolts, nuts, studs and screws, International standards, Locking devices, Types of solid and blind rivets, Heat treatment; Pipes and Unions: Rigid and flexible pipes, Standard unions; Springs: Types, Materials, Applications; Bearings: Purposes of bearings, Loads, Types, Materials; Transmissions: Gear types, Gear ratios, Driven and driving gears, Belts and pulleys, Chains; Control Cables: Types, Aircraft flexible control systems, Bowden cables.

**HEE 315 Aircraft Structures and Systems III** 2+0 2,0

Fire Protection: Fire and smoke detection and warning systems, Fire extinguishing systems, System tests, Portable fire extinguisher; Fuel Systems: System lay-out, Fuel tanks, Supply systems, Dumping, Venting and draining, Cross-feed and transfer, Indications and warnings, Refueling and defueling, Longitudinal balance fuel systems; Ice and Rain Protection: Ice formation, Classification and detection, Anti-Icing Systems: Electrical, Hot air and chemical, De-Icing Systems: Electrical, Hot air, Pneumatic and chemical, Rain repellent, Probe and drain heating, Wiper systems.

**HEE 316 Navigation Systems I** 4+0 5,0

Fundamentals of Radio Wave Propagation; ADF (Automatic Direction Finder); VOR (VHF Omnidirectional Range); DME (Distance Measuring Equipment); TACAN (Tactical Air Navigation); ILS (Instrument Landing System); MLS (Microwave Landing System); Hyperbolic Systems: OMEGA, LORAN, DECCA; Doppler Navigation; Ground Radar Systems: PSR (Primary Surveillance Radar), SSR (Secondary Surveillance Radar), Transponder; Aircraft Radar Systems: Airborne Weather Radar, Radio Altimeter; TCAS (Traffic Alert and Collision Avoidance System); GPWS (Ground Proximity Warning System).

**HEE 317 Electronic Fundamentals II** 3+1 4,0

Transistors: Construction and operation of PNP and NPN transistors, Other transistor types, Application of transistors;

Classification of Amplifiers; Simple Circuits: Bias, Decoupling, Feedback and Stabilization; Multistage Circuits: Cascades, Push-pull, Oscillators, Multivibrators, Flip-flop circuits; Integrated Circuits: Description of logic circuits and linear circuits; Introduction to Operation and Function of Operational Amplifiers: Integrator, Differentiator, Voltage follower, Comparator; Connecting Amplifiers: Resistive, Capacitive, Inductive, Inductive resistive, Direct; Positive and Negative Feedback.

**HEE 318 Electronic Fundamentals III** 2+0 3,0

Description and Use of Printed Circuit Boards; Servomechanisms: Open and closed loop systems, Follow up, Analogue transducer, Null, Damping, Feedback, Deadband, Resolvers, Differential, Control and torque, E and I transformers, Inductance transmitters, Capacitance transmitters, Synchronous transmitters, Servomechanism defects, Reversal of synchro leads, Hunting.

**HEE 319 Digital Circuits I** 2+2 3,5

Signals: Analog, discrete and digital forms, Representation of digital signal; Basic Logic Functions: NOT / AND / OR gates, Interpretation of gate circuits; Boolean Algebra and De Morgan's Theorem; Binary, Octal and Hexadecimal Number Systems: Conversion between number systems; Standard Forms of Logic Functions; Karnaugh Maps: Minimization of logic functions; Data Handling Logic Circuits: Definitions, Decoder and encoder design, Internal structure of multiplexers and demultiplexers.

**HEE 320 Digital Circuits II** 2+1 3,5

Sequential Logic Circuits: Definitions, Why do we need a memory element?, Flip-flop structure, RS, D and JK type flip flops, Internal structure of master-slave flip flops, Edge triggered flip flops, Registers, Counters, Design of sequential circuits; Memory: Random Access Memory, Connecting memories, One or two dimensional internal memory organization, Read Only Memory, ROM decoder, Switching times of memories.

**HEE 322 Unmanned Aerial Vehicle Design, Control Systems and Workshop Applications** 2+2 4,5

Aircraft Design Methodology; Mission Profiles, Competitor Study; Aircraft First Weight Estimates and Initial Sizing; Estimation of Critical Performance Parameters; Wing Loading, Weight/propulsion ratio, WS, Configuration plan; Body Configuration Selection, Tail configuration selection, Landing kit configuration selection, Propeller configuration selection, Propulsion systems, WS; Performance Analysis; Range and Durability, Landing and departure distances, Maneuverability, Flight stability and control; Longitudinal Stability, Lateral stability, Control surfaces, Cost analysis; Flight Safety and Flight Compatibility Documents (WS: Workshop Studies).

**HEE 325 Maintenance Practices I** 2+4 4,0

Safety Precautions-Aircraft and Hangars: Safe operating procedures; Workshop Practices: Care of tools, Dimensions, Tolerances, Calibration of tools and equipment, Calibration

standards; Tools: Types, Precision measuring tools, Lubrication equipment; Fits and Clearances: Limits for bow, Twist and wear, Shaft and bearing checking standards; ATA (Air Transport Association) Definitions of Aircraft Group, System and sub-system.

**HEE 403 Aircraft Instruments 3+1 4,5**

Requirements and Standards; Elements and Mechanism; Instrument Terminology; Atmosphere; Instrument Displays; Panels and Layout; Instrument Grouping; Mounting Methods; Magnetic Indicators and Flow Lines; Illumination of Instruments and Panels; Pressure Measurement; Motor Pressure Indicators; Oil Pressure Indicating System; Pressure Instruments; Barometers; Pitot-Static Systems; Sensitive Altimeter; Rate of Climb Indicator; Measurement of Airspeed; Machmeter; Airspeed Indicators; Control Air Data Computer; Gyroscopes.

**HEE 405 Distance Measuring Equipment 2+2 4,5**

Introduction to DME; How Far I Am: Calculation of distance; Specifications: Frequency band; Type of Modulation: Pulse modulation, Characteristics of mode X and Y, UHF pulse, Spectrum of transponder pulse, Pulse repetition frequency, Identification, Dead time, Time delay; DME Performance: Coverage, System capacity, Accuracy; Transponder; Receiver: Diplexer, Reception detection control unit, Receiver, Synthesizer; Video Module; Decoder Module; Transmitter: Shaper module, Modulator, Amplifiers, Locking control; Supervising Function: Monitors, Test generators; Control function, Maintenance function; Thomson DME 740.

**HEE 406 Instrument Landing System/VHF Omni Range 2+2 4,5**

Mathematical Background; Line Circuits Used in ILS/VOR; 3 db Coupler; Specifications of ILS: Definitions of approach and landing path, Electrical definition of localizer and glide path; Separate Amplitude Modulation; Antenna Combinations; Localizer Signal; Glide Path Signal; ILS Errors; Thomson ILS 381; Specifications of VOR: Azimuth, Using of VOR in navigation, Electrical definition of azimuth; VOR Reference Signal; VOR Variable Signal; VOR Error Curves; Thomson VOR 540 C.

**HEE 419 Maintenance and Repair in Aircraft Electric Systems 2+1 4,5**

Problem Areas in Aircraft Electrical Power Systems; Problems and their Solutions in AC and DC Electrical Power Systems; The Causes and Solutions of the Problems that May Occur in Nickel-Cadmium Batteries in Aircraft; Wiring on Aircraft: Solutions of the problems related to the wiring on the aircraft, Chafing and chafing prevention in aircraft wiring system; Electromagnetic Interference in Aircraft Electrical Systems: General information, Solutions for electromagnetic interference in aircraft; Case Studies for Electrical Failures and their Solutions.

**HEE 421 Communication Systems II 3+0 3,0**

Flight Interphone System; Service Interphone System; Ground Crew Call System; Flight Crew Call System;

Passenger Address System; VHF Communications System; HF Communications System; Selective Calling System; Emergency Locator Transmitter; Voice Recorder System; Printer System; Aural Warning System Master Caution System; Takeoff/landing Warning System; Clocks; Passenger Entertainment System /Audio; Passenger Entertainment System /Video; Aircraft Communication Addressing and Reporting System; Satellite Communication System.

**HEE 423 Navigation Systems II 3+0 3,0**

GPS (Global Positioning System); GNSS (Global Navigation Satellite Systems); Augmentation of Satellite Systems: SBAS (Satellite Based Augmentation Systems), GBAS (Ground Based Augmentation Systems), ABAS (Aircraft Based Augmentation Systems); Area Navigation (RNAV); Performance Based Navigation (PBN); Flight Management System (FMS); Inertial Navigation Systems (INS); CNS-ATM (Communication, Navigation, Surveillance and Air Traffic Management).

**HEE 425 Microprocessors 3+2 4,5**

Controllers: Register transfer, Complementing, Shifting, Incrementing and decrementing, Reset and set; A Simple Controller: Register responsive to multiple commands, The shift register controller; A Simple Computer: Hardware, Controller, Interrupts; An Improved Architecture: Simple commands, Addition and subtraction, Skipping, Jumping, Multiplication as a computer program, Fetch and execute cycles of an instruction; Microprogramming; Microprocessors.

**HEE 427 Troubleshooting Methodology 2+0 2,0**

Fundamentals of Failures: Definition of failure, Types of failures, Hardware failures, Software failures, Functional failures, Systematic failures, Environmental effects on failure rates, Common-cause failures, Root-cause analysis; Failure States: Overt failures, Covert failures; Troubleshooting Frameworks: Logical/Analytical troubleshooting frameworks, Generic logical/analytical frameworks, A seven-step procedure, Specific troubleshooting frameworks; Troubleshooting Scenarios; Troubleshooting Hints on Aircraft Systems: Electronic Systems, Calibration, Measurement Equipment; Failure Examples.

**HEE 428 Maintenance Practices II 2+4 4,5**

Aircraft Weight and Balance: Center of gravity/Balance limits calculation, Use of relevant documents; Aircraft Handling and Storage: Aircraft taxiing and towing, jacking, chocking, securing, Aircraft storage methods, Refueling/defueling procedures, Electrical, hydraulic and pneumatic ground supplies, Effects of environmental conditions on aircraft handling and operation; Disassembly, Inspection, Repair and Assembly Techniques; Maintenance Procedures.

**HEE 429 Aircraft Instrument Systems I 3+1 4,0**

Classification; Aircraft Indicating Systems; Atmosphere; Pressure Measuring Devices and Systems: Direct reading

pressure and temperature gauges, TAT, SAT, Temperature indicating systems; Fuel Quantity Indicating Systems; Gyroscopic Principles; Artificial Horizons; Turn and Slip Indicators; Directional Gyros; Compass Systems: Magnetic compasses, Slaved gyro compasses; Vibration Measurement and Indication; Related Terminology.

**HEE 430 Aircraft Instrument Systems II 3+0 3,0**  
Pitot Static Systems; Altimeters; Vertical Speed Indicators; Airspeed Indicators; Machmeters; Altitude Reporting/Alerting Systems; Air Data Computers; Instrument Pneumatic Systems; Ground Proximity Warning Systems; Flight Data Recording Systems; Electronic Flight Instrument Systems; Instrument Warning Systems including Master Warning Systems and Centralised Warning Panels; Stall Warning Systems and Angle of Attack Indicating Systems; Glass Cockpit.

**HEE 431 Gas Turbine Engines 3+0 4,0**  
Turbine Engines: Turbojets, Turbofans, Turboprops, Turboshifts; FADEC; Engine Indication Systems: Exhaust gas temperature indicator, Engine speed indicator, Engine thrust indicator, Engine pressure ratio indicator, Oil temperature and oil pressure indicator, Fuel temperature, fuel pressure and fuel flow indicator, Manifold pressure, Engine torque, Propeller speed; Starting System: Operation of engine starting system and components; Ignition System: Ignition system and components; Maintenance Safety Requirements.

**HEE 432 Gas Turbine Engines Workshop 0+3 2,0**  
Turbine Engines: Turbojets, Turbofans, Turboprops, Turboshifts; FADEC; Engine Indication Systems: Exhaust gas temperature indicator, Engine speed indicator, Engine thrust indicator, Engine pressure ratio indicator, Oil temperature and oil pressure indicator, Fuel temperature, fuel pressure and fuel flow indicator, Manifold pressure, Engine torque, Propeller speed; Starting System: Operation of engine starting system and components; Ignition System: Ignition system and components; Maintenance Safety Requirements.

**HEE 433 Flight Controls 2+0 2,5**  
Overview of Control Systems; Primary Controls: Aileron, Elevator, Rudder, Spoiler; Trim Controls; Pitch Trimming; Versine Signal; Active Load Control; High Lift Devices; Lift Dump and Speed Brakes; Torque Limiting; Artificial Feel and Centering; Flutter Damping; Yaw Damper; Mach Trim; Rudder Limiter; System Operation: Manual; Gust Locks; Stall Warning and Protection Systems; Balancing and Rigging; Fly by Wire.

**HEE 434 Automatic Control 2+2 4,5**  
Introduction to Automatic Control: Control, Automatic control, Input, output and command variables, disturbances; Laplace transform; System Dynamics: Electrical and mechanical system elements; Transfer Function and Block Diagrams; Controller Types: P, I, D, PI, PD and PID controllers; Stability of Control Systems; Transient Responses of Closed Loop Control Systems.

**HEE 435 Automatic Flight Systems 4+0 4,0**  
Fundamentals of Automatic Flight Control: Working principles and current terminology, Command signal processing; Modes of Operation: Roll, pitch and yaw channels; Yaw Dampers; Stability Augmentation System in Helicopters; Automatic Trim Control; Autopilot Navigation Aids Interface; Autothrottle Systems; Automatic Landing Systems: Principles and categories, Modes of operation (approach, glideslope, land, go-around), System monitors and failure conditions.

**HEE 439 Maintenance Practices-M13 I 0+7 4,5**  
Replacement of Various Avionics LRUs and Performing BITE Tests: Removal/Installation and testing of HSI, VSI etc.; Removal Installation of Some Antennas: DME, ATC and RA antennas; VHF Navigation (VOR) System: Removal/installation of components (LRUs); Weather Radar System: Component replacement, Functional test; Aircraft Electrical System: Generator power control/voltage adjustments, Replacement of electrical distribution contactor/relay/RCCB etc, Replacement of APU and main battery.

**HEE 440 Maintenance Practices-M13 II 0+3 3,0**  
Aircraft Illumination System: Change of lights and filaments in the cockpit, cabin; ADF (Automatic Direction Finder) System: Component replacement, Functional test; VHF Communication System: Identification of components, Replacement of LRUs, System test; Inertial Reference Unit/Platform: Identification, Aligning/initialization; Flight Director System: Identification, Functional test; Flight Management System: Identification, Discussion, Performing of typical maintenance practices.

**HEE 441 Maintenance Workshop Applications-M13 I 0+5 3,0**  
Electrical Power Distribution Contactor/Relay/RCCB Removal Installation; Replacement of Oven or Boiler; Remove and Refit Emergency Battery; Replacement of Electrical Hydraulic Pump; Intercommunication/Passenger Address Component Replacement and Testing; Testing of Radio Altimeter System; Automatic Flight Modes Experience and Functional Testing; Inspect and Functional Test Fire Extinguishing Systems; Inspect and Control Engine Fire Extinguishing Bottle; Check Adjustment of Propeller Micro-Switch; Demonstrate Propeller Anti-Icing/De-Icing Systems on Propeller; Replace Avionic LRU and BITE Test; Component Replacement and Functional Test on Weather Radar System.

**HEE 442 Maintenance Workshop Applications-M13 II 0+5 4,5**  
Magnetic Compass Error Calculation Adjustment; Check Magnetic Compass on Aircraft; Use of VHF Communications System; Component Replacement and Test on VHF Communication System; Component Replacement and Test on HF Communication System; Component Replacement and Test on VHF Navigation System; Radio Standing Wave Measurement Tests; Check Pitot Static Instruments; Check Pitot Static System Calibration Using

Pitot-Static Test Set; Test ILS/VOR Systems Using Test Equipment; Replacement and Functional Test of Gyroscopic Instrument or Component; Functional Test of Fuel Quantity System; DME Functional Test Using Test Set; ATC/TCAS System Component Replacement and Test.

**HEE 498 Applications of Avionics 0+6 7,5**

Research Techniques: Basic research and applied research, Data collection techniques, Data processing; Research Methods: Subject selection, Subject restriction, Reference collection; Detailed Research on a Subject in Avionics: Definition of the problem or the subject in details, Definition of solution techniques or analysis methods, Research and performing practical work, Results; Reporting: Page set up, Sentence structure, Headings, Abbreviation formats, Figure and table formats, Table of references format.

**HTK 101 Aircraft Basic Knowledge 4+0 7,0**

Theory of Flight: Aerostatics, Aerodynamics; Basic Aerodynamics: Physical characteristics of air, Standard atmosphere, Airflow, Components of aerodynamic force, Aerodynamic moment, L/D ratio; Wing: Geometrical, structural and aerodynamic characteristics, Wing configurations, Flaps; Fuselage: Geometrical, structural and aerodynamic characteristics; Landing Gear: Types and components; Flight Control Surfaces: Primary flight control surfaces, Tabs; Aircraft Power plants: Reciprocating engines and propeller, Gas turbine engines.

**HTK 103 Air Traffic Services 4+0 5,5**

Introduction to Air Traffic Control; International and National Civil Aviation Organizations; Air Rules (ICAO Annex 2), Air Traffic Services (ICAO Annex 11): Air traffic control services; Flight Information services; Alerting services; Air Traffic Control Clearances: Contents of the air traffic control clearances; Altimeter setting procedures and flight level allocation; Transition altitude; Rules and Regulations: General rules, Airspace, Air rules, Differences in ICAO and national rules, Flight Rules, Instrument Flight Rules, Visual Flight Rules; Flight Plans.

**HTK 104 Aerodrome Control Procedures 5+0 6,0**

Distribution of Responsibility among Air Traffic Control Units; Flight Plans; Aerodrome Control Tower; Introduction to Aerodrome Control Towers System; Work Positions; Aerodrome Control Services and RAMP; Functions of Aerodrome Control; Taxi and Traffic Patterns; Selection of Runway in Use; Control of Aerodrome Traffic; Separation of Aircraft and Vehicles on the Maneuvering Area; Control of Departing Aircraft; Control of Arriving Aircraft; Wake Turbulence Categories; Emergency Procedures.

**HTK 105 Introduction to Air Traffic Control 2+0 3,0**

Air Traffic Control: Definition, International and national regulations and rules; Current Documentation; Air Traffic Controller: Tasks and requirements, Process of air traffic controller selection and training, Air traffic controller license and rating, Medical requirements, Language requirements, Working units; Minimum Knowledge Requirements: ICAO and ESARR 5; Air Traffic System: Communication,

Navigation, Surveillance, procedures, airplanes, airspaces, airports.

**HTK 205 Communication and Navigation Systems 3+0 6,0**

General Information About Radio Waves; Classification of Navigation System; ADF (Automatic Direction Finder); VOR (VHF Omni Directional Range); DME (Distance Measuring Equipment); TACAN (Tactical Air Navigation); ILS (Instrument Landing System); MLS (Microwave Landing System); RA (Radio Altimeter); GPWS (Ground Proximity Warning System); RADAR (Radio Detection and Ranging); GCA (Ground Control Approach); OMEGA; GPS (Global Positioning System); INS (Inertial Navigation System).

**HTK 220 Non-Radar Control Procedures 5+0 6,0**

ATC Certification and Qualification; Distribution of ATS Responsibility; Explanation of Coordination Principles; Explanation of Need for Coordination; Definitions; Separation Standards; Air Traffic Control Clearances and Strip Markings; Essential Traffic; Control of Departing/Arriving Aircraft; Visual Approach; Parallel Runways; Emergency Situations; Phraseology; Synthetic Area; RVR; Coordination; ACAS/TCAS; Extraordinary Situations; Radio Failure; Hijacking; Engine Failure/Emergency.

**HTK 222 Aeronautical Information Management 4+0 4,5**

Aeronautical Information Service (AIS); Aeronautical Information Management; Requirements of AIM, Requirements of Aeronautical Information Publication; Chicago Convention; ICAO; IAIP; Aeronautical Information Publication (AIP), Chapters and contents, General, En-route, Aerodromes; AIP Change Service (AIP AMDT and AIRAC AIP AMDT), AIP SUP; NOTAM and PIB; AIC; AIRAC; Flight Plans.

**HTK 224 Flight Mechanics and Aircraft Performance 3+0 3,0**

Forces acting on an aircraft: Inertial forces; Aerodynamic forces; Propulsive forces; High speed flight; Subsonic Flight; Mach number and critical Mach number; Compressibility effects; Polar and lift-to-drag ratio; Level flight for turbojets and piston-props aircraft; Service Ceiling; Range and Endurance for Different Flight Condition; Climbing flight for Turbojets and Piston-props Aircraft; Rate of climb, Climb gradient, Climb time; Gliding Flight and Performances; Turning Flight and Performances; Take-off and Landing; Flight Operation Procedures.

**HTK 227 Aerodrome Control Simulation I 2+2 5,0**

ICAO Aerodrome International Location Indicators and Aircraft Call-signs; Functions of Aerodrome Control Towers; Control of Aerodrome Traffic; Control of Taxiing Aircraft; Designated Positions of Aircraft in the Aerodrome Traffic and Taxi Circuit; Aeronautical Ground Lights; Alerting Services Provided by Aerodrome Control Towers; VFR Arrival Routes; Strip marking; Taxi and ATC



Clearances for IFR Traffic; Separation Between Departing/Arriving IFR and VFR Traffics; Aerodrome Traffic Circuit; Control of Start up, Push-back Taxi and Departing Operations; Control of Departing Aircraft; Control of Arriving and Departing IFR Flights and Control of Aircraft and Vehicles on the Ground; Control of Complex Ground Operations; Control of Arriving and Departing Aircraft.

**HTK 228 Aerodrome Control Simulation II 2+4 6,0**

Control of Mixed IFR and VFR Operations; Control of Aerodrome Traffic Circuit and Touch and Go Operations; Mixed Operations: Arriving and Departing VFR Traffic with IFR Arrivals Performing Instrument Approach and Aerodrome Traffic Circuit Operations; IFR Visual Approach and IFR/VFR Flights Operational Efficiency and Review Practice; Complex Operations; Cancellation of Departing Aircraft, Go around with IFR Traffic, Selection of Runway in Use, Fire and Aerodrome Emergency Practices, Emergency Situations on Aircraft and Radio Failure.

**HTK 232 Air Traffic Communication 3+0 3,0**

Communication Systems; Activity and Quality in Communication; Aeronautical Communication Procedures; CIDIN/SITA; Aeronautical Fixed Telecommunication Service; Message Format; Parts of Messages; Priorities; Types of Message; Preparation of a Flight Plan in Aeronautical Fixed Telecommunication Network Format; Service Messages; Codes and Identifications Used in Aeronautical Fixed Telecommunication Network Messages; Decoding an AFTN Message; Aeronautical Mobile Service; Aeronautical Radio Navigation Service; Aeronautical Broadcasting Service; Aeronautical Surface Movement Control Service; Flight Data Process; Communication Equipment; Intercom; CPDLC; SELCAL.

**HTK 234 Navigation 3+0 3,5**

Need for Navigation in Aviation; Navigation Methods; The Earth; Fundamentals of Geographic Coordinate System; Time and Time Conversions; Distances and Directions on the Earth; Great Circles and Rhumb Lines; Magnetism; True North, Magnetic North, Compass North, Charts in Air Traffic Services; Symbols on Charts; Basic 1:60 Rule; Triangle of Velocities, IFR and VFR Planning.

**HTK 316 Radar Control Procedures 5+0 6,0**

Introduction; Radar; Functions of Radar; Use of Radar in the Air Traffic Control Service; Radar Services; Radar Identification Procedures; Primary radar (PSR), Secondary radar (SSR); Misidentification; Factors Causing Misidentification; Loss of Radar Identity; Radar Vectoring; Speed Control; Separation Application of Radar Separation and Minimum Radar Separation; Traffic and Position Information; Emergencies; Phraseology; Strip Marking; Introduction of Real and Synthetic Terminal Area Configuration for Practical Training.

**HTK 317 Instrument Flight Procedures 4+2 8,0**

General Criteria: Speed, Aircraft categories, Turn performance, Wind effect and wind spiral, Climb and

descent rate, Minimum obstacle clearance, Fix and fix tolerances, Flight technical tolerances; Conventional Holding Procedures, Instrument approach phases: Arrival, Initial approach, Intermediate approach, Final approach, Missed approach, Non-precision approach: Protection areas, Obstacle clearance, Circling approach; Precision approach: Obstacle assessment surface (OAS), Collision Risk Model (CRM); Departure procedures; Area navigation (RNAV) Procedures: VOR/DME RNAV, DME/DME RNAV, GNSS RNAV, RNAV Holding, RNAV Approach, RNAV Departure; Procedure design exercise.

**HTK 320 Human Factors in Air Traffic Control 3+0 4,0**

Human Role and Importance in Civil Aviation System; Aviation Safety and Human Factors; Definition of Human factors; SHELL model; Controllers? Performance and Factors Affecting Performance: Individual differences, Information processing, Situation awareness, Organizational climate, Teamwork, Stress, Shift work, Workload; Human Error: Human error in aviation, Classification, Error models; SHELL mode; Communication; Work environment: Ergonomics, Hardware, Automation, HMI, Human Factors in Future Systems.

**HTK 323 Trajectory Analysis and Prediction 3+0 4,5**

Aircraft Trajectory Analysis and Prediction in Air Traffic Management; Flight Operations: Types of flight services, Types of aircraft, Flight mission profiles; Aircraft Performance Parameters; General Aircraft Equations of Motion; Aircraft Performance Models; Energy Method; Cruise Trajectories: Maximum range and endurance, Stepped and airspeed restricted cruise; Climb and Descent Performance: Minimum time climb, Economic climb, Glide; Maneuver Performance; Trajectory Predictions: Tactical and strategic trajectory prediction; Sensitivity Analysis: Effects of wind and traffic; Conflict Avoidance: Conflict detection and resolution; Avoidance Maneuvers in the Horizontal and Vertical Plane.

**HTK 324 Surveillance Systems 3+0 3,0**

Surveillance Techniques; Basic Principles of Radar; Primary Surveillance Radar (PSR); Secondary Surveillance Radar (SSR): SSR Interrogation modes, Transponder and reply format; Monopulse SSR; SSR Mode-S; Automatic Dependent Surveillance; Broadcast; Automatic Dependent Surveillance; Contract; Multilateration; Data Link Techniques; Processing and Display of Surveillance Data; Automation; Safety Nets: MTCA, STCA, APW; Surveillance Systems for En-route, Terminal Area, Airport Operations and Aircraft.

**HTK 325 Non-Radar Control Simulation 7+1 6,5**

Terminal Area: Routes, Route minimas, Arrival procedures, Approach procedures, Separation methods, Phraseology, Coordination; Arrival Traffics: Traffics on same tracks, Reciprocal tracks, Crossing tracks, Sequencing; Departure Traffics: Departure procedures, Arrival departure traffic separation, Restrictions; Mixed Traffics: Arrivals, Departures, Runway change, Performance differences; Flight Information Region: Routes, Route minimas,

Separation methods, Coordination; Mixed Traffic: Transit traffic, Arrival traffic, Departure traffic, Arrival transit separation, Arrival departure separation, Emergency procedures, Performance differences, Speed restrictions.

**HTK 326 Radar Approach Control Simulation 7+1 14,0**  
Terminal Maneuvering Area: Routes, Route minima, MRVA, Arrival procedures, Approach procedures, Separation methods, Phraseology, Coordination; Arrival Traffic: Traffic on same tracks, Reciprocal tracks, Crossing tracks, Radar vectoring, VMC approach; Departure Traffic: Departure procedures, Arrival departure traffic separation, Restrictions; Mixed Traffic: Arrival traffic, Departure traffic, Runway change, Performance differences, Collocation change, RNAV procedures; Departure Traffic: Departure procedures, Arrival departure traffic separation; Mixed Traffic: Arrival traffic, Departure traffic, Emergency, Runway change, Performance differences.

**HTK 409 Civil-Military Air Traffic Coordination 2+0 3,0**  
Development of National Aviation; Flight Safety; Turkish Civil Aviation Law; Training Areas of Military Bases; Flight Organization of Military Bases; Military Terminal Areas of Turkish Air Space; ATC Coordination of Civil-Military ATC Units in Case of Crisis; Civil-Military Coordination During Exercises; Interception of Civil Aircraft; Onsite Visit of Military Units. Development of national aviation; Flight safety; Turkish Civil Aviation Law; Military terminal areas; Air Defense Notification Center (ADNC); Coordination between civil and military ATC units; Air defense activities; the mission of ADNC; Radar control services; VIP traffic; Responsibilities of civil/military ATC units in uncertainty phase; Civil and Military coordination during national and NATO exercises; Interception of civil aircraft.

**HTK 418 Airspace Organization 2+0 3,0**  
Airspace: Designation and establishment of airspace, Airspace restriction and reservation, Airspace classifications, Airspace configurations; Airspace sectorisation; Air traffic service (ATS) Routes: Establishment of an ATS route network, Establishment of significant points, Standard departure routes, Standard arrival routes, Alignment of ATS routes; RNAV application in airspace; Airspace and current air traffic service environment, Turkish FIR and route network, Terminal control areas (TMA), Military terminal control areas (MTMA); Flexible use of airspace; Free route airspace concept.

**HTK 423 Air Traffic Flow Management 3+0 2,5**  
CFMU (Central Flow Management Unit); FMPs (Flow Management Positions); Area of Responsibility; Organization: FDO (CFMU Flight Data Operation Division); IFPS (Integrated Initial Flight Plan Processing System); CFMU Strategic System (STRAT); CFMU ATS Data Bank Substructure Facilities; CFMU Archive System; CEU (Central Executive Unit); CFMU Tactical System (TACT); Aircraft Operator Contact Office; CFMU Operational Procedures; ATFM (Air Traffic Flow Management); Application of ATFM Measures; Exemption and Priorities;

Re-routing; Slot Allocation and Monitoring; ATFM and Departing Aircraft.

**HTK 425 Radar Area Control Simulation 7+1 12,5**  
Flight Information Region: Routes, Route minima, Separation methods, Phraseology, Coordination with approach and tower, Coordination with adjacent sectors and FIRs; Mixed Traffic: Transit traffic, Arrival traffic, Departure traffic, Arrival transit separation, Arrival departure separation, Emergency procedures, Aircraft performance differences, Speed restrictions; Using FDP: Transfer of traffic, Letters of agreement.

**HTK 426 Safety Management in Air Traffic System 2+0 2,5**  
Basic Concepts, Policies and Principles: Definition of safety and security, Priority, Safe ATC, Safety management policy, Responsibilities, Setting up a system; Impact of Regulations on Controllers; Safety Auditing: Types, Survey plans, Reports, Follow-up action plans; Incident Investigation: Steps; Risk Classification: Terminology, Risk classification and tolerability in ATC and airport systems, Safety Assessment in ATC; Hazard Analysis Techniques: Hazard analysis, Failure models, Hazard and incident trees, Human factors; Assessment and Management of Safety Cases; Safety Manager: Role, Organization and training, Media and accidents.

**HTK 428 Trends, Perspectives and Visions in Air Traffic Management 2+0 3,5**  
Brief History of Air Traffic Control; Selection, Certification and Recruitment of Controllers: ESARR 5 rules, Language proficiency criteria; Communication Problems: Language-based problems, Non-language based problems, Short- and long-term solutions; Air Traffic Control Environment: Perceptions and reality; Air Transportation Safety and Role of Air Traffic Management: Historical data and future forecasts; Aviation Security Issues and Air Traffic Control; Future Trends in Air Transportation and Their Reflections on Air Traffic Management: Aircraft, Concepts, Systems; New Technologies and Perspectives in Air Traffic Management.

**HTK 429 Development for Air Traffic Management Applications 0+4 2,5**  
Determination Air Traffic Management Problems; Literature Survey; Determination of Historical Trends of the Problem; Qualitative and Quantitative Analysis of the Current Situation; Selection of the Problematic Area for Development; Preparation and Presentation of the Report for Development; Selection of Simulation Parameters; Design of Experiments for Simulation.

**HTK 430 Simulation for Air Traffic Control and Operations Applications 0+4 5,5**  
Preparation of Simulation Scenarios in the Radar and/or Tower Simulator Systems; Running Simulations; Assessment of Results; Comparison of Developments and the Current or Hypothetical Situations; Preparation and Presentation of the Final Report.

**HTK 434 Air Traffic Management 3+0 2,5**

Origin and Development of Air Traffic Management: History of air traffic control, Development of air transportation; Definition and Components of Air Traffic Management: Air traffic services, Air traffic control, Alerting services, Flight information services, Air traffic system components, Airspace, Technical equipment, Aeroplane, Human factors, Air traffic flow management, Congestion flow management, Airspace management, Traffic flow and capacity, Separation assurance; Air Traffic Management Functions: Organization, Planning, Control, Coordination, Staffing; Capacity and Efficiency Definitions in Air Traffic System; Recent Problems in Air Traffic Management: Performance shortfalls in air traffic management, Safety, Capacity, Efficiency, Cost-effectiveness; Aircraft Performance Models; ATCO Training and Licensing; Potential Solutions: ICAO special committee on future air navigation systems, Implementation of the future CNS/ATM system.

**HTK 436 Radar Coordination Simulation 7+1 8,5**

Flight Information Region: Routes, Route minimas, Separation methods, Phraseology, Coordination with approach and tower, Coordination with adjacent sectors and FIRs; Terminal Maneuvering Area: Routes, Route minimas, MRVA, Arrival procedures, Approach procedures, Separation methods, Phraseology; Mixed Traffics: Transit traffics, Arrival traffics, Departure traffics, Arrival transit separation, Arrival departure separation, Emergency, Aircraft performance differences, Speed restrictions, Coordination methods; Collaborative Work: Information management, Transfer of control, Coordination agreements, Traffic information, Using FDP, Shift change.

**HUK 147 Air Law I (International Agreements and Aerodromes) 2+0 2,5**

The Convention on International Civil Aviation: Air navigation, ICAO; Other Conventions and Agreements: The International Air Services Transit Agreement, The International Air Transport Agreement, Tokyo, Den Haag, Montreal, Bilateral agreements, Warsaw System 1929, Montreal Convention 1999, Rome 1933-1952, Montreal 1978, The Convention of Rome 1933; Aerodromes (ICAO Annex 14, Volume I, Aerodrome Design and Operations): General, Aerodrome data, Physical characteristics, Runway and visual aids for navigation, Aerodromes operational services, Equipment and installations.

**HUK 153 Fundamentals Concepts of Law 2+0 3,0**

Social Rules and Law; Concept of Law and Legal Sanctions; Characteristics of Legal Rules; Sources of Law; Branches of Law; Definition and Types of Legal Rights; Legal Capacity: As subject of rights, Capacity to act; Kinship; Domicile; Protection of Personality; Possession; Ownership; Obligation and Responsibility; Judiciary Systems.

**HUK 154 Commercial Law 2+0 3,0**

Commercial Law Concept and Commercial Enterprise; Merchant; Commercial Name; Commercial Register; Unfair Competition; Commercial Reports; Merchant Assistant;

Current Account; Partnership Concept; Definition and Elements of Partnership; Collective Partnerships: Establishment, Operation, Ending; Commanded Partnership: Establishment, Operation, Ending; Joint Stock Corporation: Establishment, Operation, Ending; Limited Company: Establishment, Operation, Ending.

**HUK 250 Air Law II (ATC Procedures and Flight Procedures) 2+0 3,0**

Applicability of the Rules of the Air; General Rules; Visual Flight Rules; Instrument Flight Rules; Interception of Civil Aircraft; Air Traffic Services and Air Traffic Management; Airspace; Air Traffic Control Services; Flight Information Services; Alerting Services; Air Traffic System Capacity and Air Traffic Flow Management: Information, RNAV departure procedures and RNP based departures; Approach Procedures: General criteria, Approach procedure design, Arrival and approach segments, Missed approach, Visual manoeuvring-circling approach, RNAV approach procedures based on VOR/DME.

**HUK 252 Labor Law 2+0 2,5**

History of Labor Law; Sources and Basic Principles of Labor Code: Employee, Employer, Representative to the employer; Work place; Contract of Service: Types and termination, Consequences of termination, Severance pay; Regulation of Work with regard to Workers; Groups to be Protected (Women, Children, Handicapped and Sentenced Workers); Health and Security at the Work Place; Working Time; Overtime Work; Night Work; Preparing, Completing and Cleaning at Work.

**HUK 418 Air Law 2+0 2,5**

Introduction to Air Law; International Agreements and Organizations; Chicago Convention; International Civil Aviation Organization (ICAO); Warsaw Convention and Responsibility of Carrier; Hague Convention; Air Traffic Rights Agreement; Tokyo Convention; Europe Civil Aviation Conference (ECAC); Euro-control; Joint Aviation Authority (JAA); Turkish Civil Aviation Law; Aircraft: Concept and Types, Legal Nature of Aircraft, Identity, Nationality, Registration, Ownership; Aircraft Operator: Operator's responsibility, Operator's Insurance Commitment; Air Transportation Contract; Competition and Alliance Regulations in Air Transportation.

**HYO 105 Air Transportation Management 3+0 3,0**

Economic Characteristics of the Airlines: General oligopolistic characteristics, Unique economic characteristics; Airline Management and Organizations; Airline Passenger Marketing: Development of the marketing concept; Forecasting Methods; Airline Pricing; Principles of Airline Scheduling; Principles of Airline Advertising; JAR-OPS Commercial Air Transportation: Certificates, Operators' responsibilities, Maintenance management, Maintenance records and log books, Accident /occurrence reporting.

**HYO 107 Airport and Airport Equipment 3+0 4,5**

Definitions; Aerodrome Data; Physical Characteristics; Obstacle Restriction and Removal; Visual Aids for Navigation; Markings, Lights, Signs and Markers; Visual Aids for Denoting Obstacles; Visual Aids for Denoting Restricted Areas; Equipment and Installations; Emergency and Other Services.

**HYO 108 Aircraft Materials I 3+2 4,0**

Ferrous Materials: Properties and identification of common alloy steels used in aircraft, Heat treatment of alloy steels; Hardness, Tensile, Fatigue and Impact Tests for Ferrous Materials; Non-Ferrous Metals: Characteristics, properties of common non-ferrous materials used in aircraft, Heat treatment of non-ferrous materials; Hardness, Tensile, Fatigue and Impact Tests for Non-Ferrous Metals; Corrosion: Chemical fundamentals, Galvanic corrosion, Microbiological corrosion, Stress corrosion, Types of corrosion, Corrosion protection measures.

**HYO 112 Aviation Legislation 4+0 3,0**

Regulatory Framework: Role of the International Civil Aviation Organization (ICAO), Role of EASA, Relationship between various regulatory instruments; Details of Part-66; Details of Part-145; Air Operations: General information on EU-OPS, Air operators certificate and its requirements; Certification of Aircraft, Parts and Appliances: General information on Part-21, Documents to be carried; Continuing Airworthiness; Other Applicable National and International Requirements.

**HYO 113 Aviation History 2+0 2,0**

A general look at the concept of "flying" since the ancient times; Flying in mythology and the birth of the idea of aircraft; A general look at the Aviation History around the world A general look at the Turkish Aviation History; A general look at today's aviation and its evaluation and interpretation; The birth and development of various aircraft (Balloon, Zeppelin, Helicopter, Airplane etc.); The personalities and events that played an important role in Aviation History around the world; The personalities and events that played an important role in Turkish Aviation History.

**HYO 115 Introduction to Civil Aviation 2+0 3,0**

Historical Development of Civil Aviation: Origin, Development, Maturity and Deregulation period; Civil Aviation Activities; Airport: Definition of airside and landside facilities; International Civil Aviation Conventions; Importance of International Civil Aviation Organizations; National Civil Aviation System: Regulators, Organizations; Air Transportation in Turkey: Airlines, Airports; Air Transportation in the World: Privatisation, Alliances and Mergers.

**HYO 216 TUSAŞ Program 5+9 15,0**

Health of Workers and Security of Work; Technical English; Main Engine Knowledge of F-110 and F-100: Air inlet, Compressors, Combustion chamber; Turbine Section: Types of turbine blades and their operating characteristics; Exhaust;

Bearings and Seals; Lubricants and Fuels; Lubrication Systems; Fuel Systems; Air Systems; Starting and Ignition Systems; Engine Indication Systems; Power Increasing Systems; Baroscopic Control; Quality Control Systems; Paper Works of Engine Installation; Education of Engine Installation Workshop; Engine Test; Engine Storage and Preservation.

**HYO 219 Aircraft Materials II 2+2 3,0**

Introduction of Nonmetallic Materials; Classification of Composite Materials; The Selection Criteria for Aircraft Structure; Specific Examples of Aviation Application of Nonmetallic Materials; Fiber Reinforcements; Matrix Materials; Atomic and Micro Structure of Composite Materials; Mechanical Behaviours of Composite Materials; Fabrication Techniques of Composite Structures; Environmental Degradation of Composite Structures; Assembly Methods of Composite Structures; Maintenance and Repair Techniques of Composite Structures.

**HYO 220 Aircraft Materials II 3+2 4,0**

Introduction of Nonmetallic Materials; Classification of Composite Materials; The Selection Criteria for Aircraft Structure; Specific Examples of Aviation Application of Nonmetallic Materials; Fiber Reinforcements; Matrix Materials; Atomic and Micro Structure of Composite Materials; Mechanical Behaviours of Composite Materials; Fabrication Techniques of Composite Structures; Environmental Degradation of Composite Structures; Assembly Methods of Composite Structures; Maintenance and Repair Techniques of Composite Structures.

**HYO 221 Electrical Fundamentals I 3+0 3,0**

Electron Theory: Distribution of electrical charges within atoms, molecules, ions, compounds, Molecular structure of conductors, semiconductors and insulators; Static Electricity and Conduction: Distribution of electrostatic charges, Coulomb's Law; Electrical Terminology: Voltage, Current, Resistance, Conductance, Charge; Generation of Electricity; DC Sources of Electricity: Primary cells, Secondary cells, Cells connected in series and parallel; DC Circuits: Ohms Law, Kirchoff's Voltage and Current Laws; Resistance/Resistor: Factors affecting resistance, Resistor colour code, Resistors in series and parallel; Power: Power formula.

**HYO 222 Electrical Fundamentals II 3+0 3,0**

Capacitor; Magnetism; Inductor; AC Theory: Sinusoidal waveform, Phase, Period, Frequency, Calculations of voltage, current and power; Resistive, Capacitive and Inductive Circuits: Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel, Impedance, Phase angle, Power factor and current calculations, True power, apparent power and reactive power calculations; Filters.

**HYO 223 Electrical Fundamentals Laboratory I0+2 1,5**

Electron Theory: Distribution of electrical charges within atoms, molecules, ions, compounds, Molecular structure of conductors, semiconductors and insulators; Static Electricity

and Conduction: Distribution of electrostatic charges, Coulomb's Law; Electrical Terminology: Voltage, Current, Resistance, Conductance, Charge; Generation of Electricity; DC Sources of Electricity: Primary cells, Secondary cells, Cells connected in series and parallel; DC Circuits: Ohms Law, Kirchoff's Voltage and Current Laws; Resistance/Resistor: Factors affecting resistance, Resistor colour code, Resistors in series and parallel; Power: Power formula.

#### **HYO 224 Electrical Fundamentals**

##### **Laboratory II**

**0+2 1,5**

Capacitor; Magnetism; Inductor; AC Theory: Sinusoidal waveform, Phase, Period, Frequency, Calculations of voltage, current and power; Resistive, Capacitive and Inductive Circuits: Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel, Impedance, Phase angle, Power factor and current calculations, True power, apparent power and reactive power calculations; Filters.

#### **HYO 225 Aircraft Maintenance Terminology I 3+0 4,0**

Fundamentals of Aviation English: Word order; Location; Conjugation; Instructions; Procedures; Basic Sentence Structure; Word Endings: Prefixes and suffixes; Physical Characteristics; Dimensions; Purposes; Conjunctions; Actions; Conditions; Comparisons; Movement; Active and Passive; Processes; Functions; States; Failures; Damage; Connections; Units; Common Errors; Simplified English; Terminology of Maintenance.

#### **HYO 226 Aircraft Maintenance Terminology II 3+0 4,0**

Introduction to the Use of Maintenance Manuals; Air Conditioning and Cabin Pressurization; Auto Flight; Instruments and Avionics Systems; Communications; Electrical Power; Equipment and Furnishing; Fire Protection; Flight Controls; Fuel; Hydraulic Power; Ice and Rain Protection; Landing Gear; Lights; Navigation; Oxygen; Pneumatic; Water and Waste System; Doors; Airframe and Structures; Power Plant.

#### **HYO 304 Aircraft Manufacturing Technologies 3+0 3,5**

Fabrication and Processing of Composite Materials; Plastic Forming: Hot and cold plastic forming; Plastic Forming for Forging; Extrusion and Rolling; Casting Process; Heat Treatments for Metal Alloys; Surface Erosion and Lubrication, Classification of Machine Tools; Tool Bit; Permanent Assembling: Welding, Riveting; Removable Assembling: Bolt fasteners.

#### **HYO 313 Electrical Machinery**

**3+0 3,0**

Magnetism: Magnetic circuits, Care and storage of magnets; Transformers: Single, three phase and auto transformers; DC Motor and Generators: Construction, principles of operation, Characteristics, Efficiency, Starter generator; Three-Phase Circuits: Wye and delta connections, Power, voltage and current relationships; AC Motors and Generators: Single and three phase AC voltage generation, Revolving armature and revolving field type AC generators, Single, two and three phase alternators, Permanent magnet generator,

Construction, principles of operation, characteristics of AC synchronous and induction motors both single and polyphase, Starting, Speed control and direction of rotation.

#### **HYO 315 Electrical Machinery Laboratory 0+2 1,5**

Magnetism: Saturation point; Single, three phase and auto transformers; DC Motor/Generator: Constructions, Principles of operations, Series, shunt wound and compound motors/generators, No load and full load operation, Efficiency, Torque, Speed and direction of rotation of DC motors; Three-Phase Circuits: Wye and delta connections; AC Generators: Operation and construction of revolving field type three phase AC generator; AC Motors: Construction, Principles of operation and characteristics of AC synchronous and induction motors both single and polyphase, Speed control and direction of rotation, Methods of producing a rotating field: Capacitor, Inductor, Split pole.

#### **HYO 317 Aircraft Aerodynamics**

**3+2 5,0**

Physics of the Atmosphere: International Standard Atmosphere (ISA), Application to aerodynamics; Airflow Around a Body: Boundary layer, Laminar and turbulent flow, Free stream flow, Relative airflow, Upwash and downwash, Vortices, Stagnation; Airfoil and Wing Terminology: Camber, Chord, Mean aerodynamic chord, Profile (parasite) drag, Induced drag, Center of pressure, Angle of attack, Wash in and wash out, Fineness ratio, Wing shape and aspect ratio; Thrust; Weight; Aerodynamic Resultant; Generation of Lift and Drag: Angle of attack, Lift coefficient, Drag coefficient, Polar curve, Stall; Airfoil Contamination due to Ice, Snow and Frost.

#### **HYO 324 Electronic Instrument Systems**

**4+1 5,0**

Electronic Instrument System; Electronic Displays: Principles of operation of common types of displays used in modern aircraft, including CRT, LED and LCD; Electrostatic Sensitive Devices: Special handling of components sensitive to electrostatic discharges, Awareness of risks and possible damage, Component and personnel anti-static protection devices; Software Management Control: Awareness of restrictions, Airworthiness requirements and Possible catastrophic effects of unapproved changes to software programmes; Typical Electronic/Digital Aircraft Systems: General arrangement of typical electronic/digital aircraft systems and associated BITE.

#### **HYO 326 Aircraft Electricity Workshop**

**2+4 5,0**

Electrical Cables and Connectors: Cable types, structures and characteristics, Connector types pins, Plugs, Sockets, Insulators, Current voltage rating, Coupling identification codes; General Test Equipment in Avionics: Operation, function and use; Electrical Wiring Interconnection System: Continuity insulation bonding and test, Crimping tools and joint test, Connector pin removal and insertion, High tension and coaxial cable installation test, Identification of wire types, Inspection and damage, Wiring protection, Cable looming and support, Clamps, Sleeving, Shielding, EWIS installations, Maintenance and cleaning; Soldering: Methods, Inspection; Abnormal Events: Lightning strikes and HIRF penetration inspection.

**HYO 328 Aircraft Electrical Systems 5+0 5,0**

Introduction to Electrical Power; Power Distribution Part; Emergency Power Generation; Distribution Components: Circuit protection, Fuses, Circuit breaker, Power relay, Current transformer; AC Generation: Inverters, Variable Speed Constant Frequency (VSCF) generator; CSD (Constant Speed Drive); Generator Control and Protection: Voltage regulation; Frequency Regulation; DC Generation; Transformer Rectifiers Unit; Batteries Installation and Operation; External Power; External Lights: Navigation, Landing, Taxiing, Ice lights; Internal Lights: Cabin, Cockpit, Cargo; Emergency lights.

**HYO 334 Sustainable Aviation Technologies 2+0 2,0**

Green Airports; Design and Construction Studies, Indoor air quality, Energy and material, Green engine; Combustor Design, Renewable energy sources in aviation; Alternative/Green Aviation Fuels, More electric aircraft (MEA); All Electric Aircraft (AEA); Thermal Management of Batteries, Life cycle design and life cycle assessment; Calculate of Life Cycle for Aviation Materials, Life cycle assessment of aerial vehicles.

**HYO 406 Helicopter Theory and Systems 3+0 4,5**

Fundamental Concepts: Angular velocity, Tangential velocity; Aerodynamic concepts; Blade and Propeller; Forces Acting on a Blade During Rotation: Flapping, Dissymmetry of lift; Articulations: Flapping, dragging, feathering; Flight Control Systems; Tail Rotor: Torque Effect of Main Rotor; Air Flow Effect Passing Through a Blade Under Different Flight Conditions; Autorotation; Helicopter Flight; Airspeed Limitations; Airframe Systems; Landing Gears.

**HYO 409 Case Studies in Aviation Safety 2+0 3,0**

Classification of the Factors Affecting Aviation Safety; Flight Operation-oriented Accidents: Flight crew, Communication and procedural errors; Aircraft-oriented Accidents: Design and material failures; Maintenance-oriented Accidents: Personnel and procedural errors; Airport/Air Traffic Control-oriented Accidents: Midair and runway collisions; Accidents due to Meteorological and Geographical Conditions; Security-oriented Accidents: Terrorist attacks and security errors.

**HYO 410 Applications of Powerplant-Airframe Maintenance 0+6 7,5**

Research Techniques: Basic research and applied research, Data collection techniques, Data processing; Research Methods: Subject selection, Subject restriction, Reference collection; Detailed Research on a Subject in Aircraft Structure or Power plant Maintenance: Definition of the problem or the subject in details, Definition of solution techniques or analysis methods, Researching and performing practical works, Results; Reporting: Page set up, Sentence structure, Headings, Abbreviation formats, Figure and table formats, Table of references format.

**HYO 411 Vibration Analysis in Aircrafts 2+1 3,0**

Basic Concepts: A short history of mechanical vibrations; Importance of mechanical vibrations, What is vibration; Kinematics of vibrations: Basic elements of vibrations, Degree of freedom, Types of vibrations, Natural frequencies; Classification of vibrations, Linear and nonlinear vibrations; Clear and random vibrations; One degree-of-freedom vibration; Multi degree-of-freedom vibration; Fourier series; Laplace transformation; Isolation of vibration; Resources of aircraft vibrations and using vibration analysis systems; Vibration indication in aircraft: Devices in indications and indication techniques, Data Analysis, Adjudication.

**HYO 413 Aircraft Systems Design 2+2 4,5**

Project Requirements; aerodynamic design: airfoil, wing parameters, fuselage and wing configurations, control surfaces, performance and stability analysis; structural design: material, strength analysis and testing, wing and fuselage construction; propulsion : engine, propeller, performance analysis and testing: Avionics and Control; control parameters, control units and integration; optimization of all parameters according to the Project requirements and integration, manufacturing: prototype and flight testing; Project presentation and reporting.

**HYO 415 Academic and Technological Progresses in Aviation 3+0 3,0**

Introduction; Academic Studies; Propulsion in the Current Century: Conventional and unconventional systems; Powerplants: Materials, Cooling, Cycles, Combustion chambers; Airframe Systems: Winglet technology, BWB; Alternative Fuels: Hydrogen, Cryoplane, Model 304 hydrogen fuelled jet engine, Biodiesel; Subjects Related to Fuel Consumptions: Cost index, Continuous descent approach, Lower cruise speed, Weight effect; Environmental Effects: Emissions, Noise; Technological Subjects: New generation commercial and military aircraft, Afterburner, VSTOL, SR71.

**HYO 416 Reciprocating Engine Theory, Systems and Maintenance 3+0 3,0**

Reciprocating engine cycles: General information, Ideal reciprocating engine cycles, Otto cycles, Diesel cycles; Engine performance calculation methods; Energy analysis of reciprocating engines; Engine Characteristics: Loss analyses, Energy balance, Effects of engine parameters on engine performance; History of Reciprocating Engines; Operational principles of reciprocating engines: Four-stroke engines, two-stroke engines, Comparison of engines, Reciprocating engines in aircrafts; Reciprocating engine systems: Lubricating systems, Fuel systems, Ignition systems, Indicating systems; Vibrations: Basic Concepts, Effects of vibrations on engine, Availability in troubleshooting; Maintenance of reciprocating engines: Categorization of maintenance, Using maintenance methods in reciprocating engines with max. 450 Hp, Troubleshooting; Engine Testing: Power measurement, Pressure measurement, Temperature measurement.

**HYO 420 Electromagnetic Environment 2+0 2,5**

Electrostatic Fields: Coulomb's law, Gauss's law, Electric potential and dipole; Magnetic Fields: Ampere's law and applications, Magnetic flux density, Maxwell's equations for static EM Fields; Maxwell's Equations: Faraday's law, Maxwell's equations in final forms, Time-harmonic fields; Electromagnetic Wave Propagation: Wave propagation in lossy dielectric, Planewaves in lossy dielectric, free space and good conductors; Effects of the Following on Maintenance of Electronic System: EMC-Electromagnetic Compatibility, EMI-Electromagnetic Interference, HIRF-High Intensity Radiated Field; Lightning/Lightning Protection.

**HYO 422 Human Factors 3+0 3,0**

Fundamentals of Aviation Safety: Concepts of risk and safety, Accidents and incidents, Measurement of safety; Factors Affecting Aviation Safety; Human Performance and Limitations; Social Psychology; Factors Affecting Performance; Physical Environment; Tasks; Communication; Human Error and Error Management Models; Hazards in the Workplace; Maintenance Resource Management; Case Studies on Aircraft Maintenance.

**HYO 424 Modern Avionic Systems 3+0 3,0**

Integrated Modular Avionics (IMA): Functions of typically integrated IMA modules and others systems: Core System; Network Components; Cabin Systems: Data/Radio communication, In-flight entertainment system; Access to Pre-departure/Departure Reports; E-mail/Intranet/Internet Access; Passenger Database; Cabin Core System; In-flight Entertainment System; External Communication System; Cabin Mass Memory System; Cabin Monitoring System; Information Systems: Air Traffic and Information Management Systems and Network Server Systems; Aircraft General Information System; Flight Deck Information System; Maintenance Information System; Passenger Cabin Information System.

**HYO 426 Ergonomics in Aviation 2+1 3,0**

Ergonomics; Work System: Workload, Strain; Human Anatomy; Human Performance and Limitations; Anthropometry; Cognitive Ergonomics: Situational awareness, Human error, Cognitive ergonomics applications in aviation; Fatigue; Environmental Factors: Air conditioning, Lighting, Noise, Vibration; Human-Machine System; Work and Workplace Design in Aviation Maintenance Activities; Lifting, Carrying, Force use; Work Tools and Instruments; Work Life and Safety; Ergonomics Evaluation of a Hangar; Occupational Accidents and Statistics in Aviation Maintenance Activities.

**HYO 428 Aviation Meteorology 3+0 3,0**

Atmosphere: Temperature, Humidity, Density; Pressure: Pressure systems (low pressure, high pressure); ICAO Standard Atmosphere; Wind: Jetstream; Types of Clouds and Meteorological Events (rain, fog, etc); Visibility: Meteorological events affecting runway visibility; Air Mass and Fronts; Icing; Thunder Storms; Turbulence; Atmospheric

Circulation; Meteorological Documentations and Reports (METAR, TAF, SPECI, TREND).

**HYO 451 General Aviation 3+0 3,5**

Concept and Content of General Aviation; Development of General Aviation; Regulations in General Aviation; Practices of General Aviation in the World; General Aviation in Turkey: Training facilities, Air taxi operations, Aircraft rent, Corporate aviation, Personal and private purposes in general aviation, Sport, Demonstrational and promotional purposes in general aviation; Types of Aircraft Used in General Aviation; Future of General Aviation.

**İKT 153 Economics I 3+0 4,5**

Introduction to Micro Economics; Demand: Concept, Function, Patterns, Elasticity; Supply: Concept, Function, Patterns, Elasticity; Supply-Demand Equilibrium and Variation; Consumption Theory: Utility, Principles of diminishing marginal utility, Marginal utility, Consumer's balance; Production Theory: Production function, Technology, Law of diminishing returns, cost curves, Producer's balance and its changes, Production cost; Perfect Competition Market; Imperfect Competition Markets: Monopoly, Oligopoly, Monopolistic competition, Monopoly; Factor Markets; Welfare Economy.

**İKT 154 Economics II 3+0 4,5**

Introduction to Macroeconomics; Gross National Product and Its Measurement; National Income Terms; Distribution of National Income; Consumption; Investment; Public Expenditures; Export, Import, Balance of Payments; Money Supply and Demand; Equilibrium in Commodity Market; Equilibrium in Money Market; Equilibrium in Macroeconomy, Inflation; Unemployment; Economic Growth Theories and Economic Development; Classical and Keynesian Sights; Last Approaches and Theories in Macroeconomy; Basic Problems in Macroeconomy; Turkish Economy.

**İKT 420 European Union and Turkey 2+0 3,0**

European Community: Establishment, Enlargement, Goals, Foundations, Management of European community, Criterion for membership, Results of membership; Economic and Monetary Union; Harmonization of Economic and Social Policies; Budget and European Investment Bank; Relationship Between Turkey and European Union: The history of relations, Terms of partnership, Financial assistance; Completing of Customs Union between Turkey and European Union: The establishment and scope of customs union, The effects of customs union on Turkish economy; The Analysis of European Summit Decisions.

**İLT 307 Communication 3+0 3,0**

Communication: Description of communication, Components of communication process; Functions and Types of Communication; Introduction to Empathic Communication: Description of empty, History of empty, Difference between empty and sympathy; Transactional Analyse: Parent personality, Child personality, Adult personality; Process of Empathic Communication:

Components, Skill of listening; Improved of emphatic skill; Intellectual Background of Communication: Importance of listening and understanding; Organizational Communication: Communication process in organizations; Types of Communication in Organizations: Verbal communication, Non-verbal communication, Written communication; Preparation of CV; What's cv?, Examples of cv; Body Language.

**ING 117 English Speaking Skills I 6+0 4,0**

Listening: Identifying main ideas, Listening for details, Predicting content; Speaking: Expressing agreement or disagreement, Asking for repetition, Keeping a conversation going by adding information; Expanding Knowledge of Frequently Used Words and Phrases; Pronunciation: Recognizing and practicing consonant and vowel sounds, Studying problematic sounds; Online Practice; Grammar; Presenting new structures and tenses.

**ING 118 English Speaking Skills II 6+0 4,0**

Listening: Understanding keywords to identify a topic, Listening for specific words in context to figure out their meanings; Speaking: Asking follow-up questions to keep a conversation going, Asking for clarification to make sure of correct comprehension, Conducting an interview, Role play practices; Pronunciation: Recognizing and practicing consonant and vowel sounds, Studying problematic sounds; Online Practice.

**ING 119 Aviation English I 6+0 4,0**

Listening: Identifying main ideas, Listening for details, Predicting content; Understanding Keywords in Listening; Speaking: Expressing agreement or disagreement, Asking for repetition, Keeping a conversation going by adding information; Role Play Activities; Improving Presentation Skills; Pronunciation: Recognizing and practicing consonant and vowel sounds, Studying problematic sounds; Studying Some Important Sounds for Flight Training Students; Online Practice.

**ING 120 Aviation English II 6+0 4,0**

Listening: Understanding keywords to identify a topic, Listening for specific words in context to figure out their meanings; Speaking: Asking follow-up questions to keep a conversation going, Asking for clarification to make sure of correct comprehension, Conducting an interview, Role play conversations; Improving Presentation Skills; Pronunciation: Recognizing and practicing consonant and vowel sounds, Studying problematic sounds; Studying Some Important Sounds for Flight Training Students; Online Practice.

**ING 127 English I 4+0 4,0**

Introductions, a New Business; A Business Problem; Business Travel; Food and Entertaining; Buying and Selling; Buying Luxury Brands; A Family Business; Advertising on the Internet; A Joint Venture; Communication, E-mail and Overtime; Avoiding Misunderstandings; Jobs and Working Fields; Work and Leisure Activities; Where You Live and Related Problems; A Place You Know Well; Dining Etiquette; Buying a Product; Types of Colleagues; Starting a

Business; Marketing a New Product; Successful Companies; Using the Internet; Plans for the Future; Company Cultures; Skills You Need for a Job.

**ING 128 English II 4+0 4,0**

A Work Day, Job Titles and Job Descriptions: Corporate culture, Describing changes in a company, Asking questions about companies and jobs; Company History; Describing Equipment, Describing Problems with Equipment; Processes and Procedures; Distribution and Delivery; Information about Orders and Deliveries; Advertising and Marketing; Planning; Transport; A Travel Anecdote; Business Travel; Out-of-Office Activities.

**ING 187 English I 3+0 3,0**

Using Personal Pronouns and Possessive Adjectives; Using to be in Present Tense; Using Singular and Plural Nouns; Using Basic Language Related to Food and Drink; Using "There is-there are" in sentences; Using "have got"; Asking "yes-no" Questions and Giving Short Answers to Them; Talking about Daily and Weekly Routines; Talking about Likes and Dislikes; Talking about Sports and Hobbies; Talking about Abilities by Using "can", "can't"; Using Adjectives that Describe People; Talking about Appearance, Personality and Feelings of People; Talking about Clothes and Colours; Talking about Shopping and Prices; Using Present Continuous Tense.

**ING 188 English II 3+0 3,0**

Using Simple Present Tense; Comparing Simple Present and Present Continuous Tenses; Using Prepositions of Time and Place; Giving Directions, Making Reservations; Using "to be" in Past Tense; Using Regular and Irregular Verbs in Simple Past Tense; Using Comparative and Superlative Form of Adjectives; Using Modals to Give Advice; Suggestions and Obligations; Using Future Tense: Making Sentences Using "going to" and "will"; Using If Clauses Type 0 and 1.

**ING 205 Aviation English III 4+0 4,0**

Introduction: Language and RT communications in aviation; Hazards on the Ground: Ground movements, Communication on the ground, Runway incursions; En Route: Environmental threats, Level busts, Decision making; Approach and Landing: Approach and landing incidents, Handling technical malfunction, Reducing approach and landing risks, Plain English for communication between pilots and air-traffic controllers; Runway Incursions; Flight Control Systems; Animals on the Ground and Bird Strikes; Medical Emergency; Fire Risk; Meteorology; Landing Gear and Braking; Fuel and Icing; Pressure; Unlawful Interference.

**ING 219 English Speaking Skills III 4+0 2,0**

Introduction: Language and RT communications in aviation, Examples of miscommunication; Hazards on the Ground: Ground movements, Communication on the ground, Runway incursions; En route: Environmental threats, Level busts, Decision-making; Approach and Landing: Approach and



landing incidents, Handling technical malfunction, Reducing approach and landing risks; Environmental threats.

**İNG 220 English Speaking Skills IV 4+0 2,0**

Introduction: Plain English for communication between pilots and air-traffic controllers; Weather Problems; Warning about Hazards and Risks; Runway Incursions; Flight Control Systems; Animals on the Ground and Bird Strikes; Medical Emergency; Fire Risk; Meteorology; Landing Gear and Braking; Fuel and Icing; Pressure; Unlawful Interference; Checking and Asking for an Alternative; Airport Markings and Airside Vehicles.

**İNG 229 English III 4+0 3,5**

Ideas about Careers, Talking about Career Plans; Deciding on a Successful Candidate for a Job; Talking about Shopping Habits; Negotiating and Reaching an Agreement; Types of Companies; Discussing Ideas; Causes of Stress and Stressful Jobs, Suggesting Ways of Reducing Stress of Staff; Corporate Entertaining; Ideas about Marketing; Planning; Qualities and Skills of a Good Manager; Managing Conflict; Public and Private Sector Companies; Discussing Favorite Products.

**İNG 230 English IV 4+0 4,0**

Human Resources, Staff Development and Training; Marketing, Entering the market, Launching a product, A stand at a trade fair; Entrepreneurship, Starting a Business, Financing a Start-up; Expanding into Europe, Presenting Your Business Ideas; Business Travel Abroad: Arranging business travel, Business conferences, Business meetings; Innovation Management; Customer Relations; Customer Satisfaction and Loyalty; Social Media and Business Relations; Staff and Customer Surveys.

**İNG 303 Aviation English IV 60+0 3,0**

Introduction: English needed to communicate in non-routine and emergency situations during flight operations; Near Miss; Special Flights; Delays; Belly-landing; On-board Fire; Pilot Incapacitation; Ditching; Wind and Turbulence; Icing and Storms; Depressurization; Passenger Problems; Bomb Scare; Aircraft Mechanical and Electrical Breakdown; Volcanoes; Dangerous Goods; Collisions; Airfield and Navigation Equipment Failure.

**İNG 304 Aviation English V 60+0 3,0**

Emergency Scenarios: Description of an emergency presented in a visual or an animation, Emergency prevention strategies, Emergency response procedures, Possible incidents; Situational Awareness; Flight Preparation; Using Correct Phraseology; Understanding and Responding to International Accents; Discourse Management Strategies; Note-taking and Readback from Live ATC-Pilot Dialogues.

**İNG 307 Aviation English I 4+0 5,0**

Aviation Alphabet and Numbers; Aviation Industry; Civil Aviation Organizations and Associations; Air Transportation; Airport Design; Environmental Impacts of Airports; Aircraft Accidents; New Aircraft Design; Air Cargo Industry; Airline

Marketing; In-flight Entertainment; Global Alliances; Airline Mergers.

**İNG 308 Aviation English II 4+0 5,0**

Air Transportation System; Social and Economic Impacts; Elements of Air Transportation: Regulatory organizations, airlines; airports, ATC services, catering and ground handling services; Liberalization and Privatization Trends in Air Transportation; International Economic Regulations; Airline Management and New Management Approaches; Airline Marketing; Airline Human Resources; Airport System and Environmental Impacts: Noise, air pollution; Air Cargo Industry; Future of Air Transportation in Turkey and in the World.

**İNG 321 English Speaking Skills V 4+0 2,0**

Introduction: English needed to communicate in non-routine and emergency situations during flight operations; Describing a Picture of an Aviation-related Incident; Studying Vocabulary to Communicate Effectively on a Wide Variety of Familiar and Unfamiliar Topics; Near Miss; Special Flights, VIP Flights; Delays; Belly-landing; On-board Fire; Pilot Incapacitation; Ditching; Wind and Turbulence; Icing and Storms.

**İNG 322 English Speaking Skills VI 4+0 2,0**

Introduction: English needed to communicate in non-routine and emergency situations during flight operations; Listening Texts Involving Radiotelephony Exchanges with a Mixture of Aviation English and Plain English; Depressurization; Passenger-related Problems; Bomb Scare; Problems Deriving from Passengers; Aircraft Mechanical and Electrical Breakdown; Volcanoes; Dangerous Goods; Collisions; Airfield and Navigation Equipment Failure; Airfield Activities.

**İNG 325 Academic English III 3+0 3,0**

Reading Skills for Academic Study: Developing reading fluency, Adapting reading style to different text types, Practicing critical reading skills; Listening Skills for Academic Study: Listening to longer texts, Listening to short authentic texts, Recognizing stress and intonation; Speaking Skills for Academic Study: Asking for clarification, Asking for confirmation, Giving reasons and explanations, Giving short presentations on familiar topics; Writing Skills for Academic Study: Identifying different styles of paragraphs, Paraphrasing ideas in short texts, writing academic paragraphs, Writing formal and informal academic texts, Writing summaries.

**İNG 326 Academic English IV 3+0 3,0**

Reading Skills for Academic Study: Adjusting speed and reading style to different genres and tasks, Reviewing and analyzing material, Focusing on critical reading skills, Recognizing biases in written works; Listening skills for academic study: Listening to longer authentic texts, Taking notes, Distinguishing facts from opinions, Drawing inferences; Speaking Skills for Academic Study: Participating in group discussions, Expanding opinions, Giving longer presentations on familiar topics; Writing skills

for academic study: Expressing opinions in well-organized academic essays, paraphrasing ideas in texts, writing summaries of longer texts.

**İNG 401 Advanced English I 4+0 3,0**

Globalization: Brands, Store brands, Brand loyalty; Travel, Videoconferencing; Managing Change Successfully: Advertising, Internet advertising, Shock advertisements; Financial Reporting; Employment: Human capital planning; International Trade: International markets, Getting into new markets, Competition, Competition advantages, Competitors, Breaking up monopolies; Innovation; Organization; Money and Global Trends; Business Ethics; Business Strategies.

**İNG 402 Advanced English II 4+0 3,0**

Communication, Corporate Communication, Twitter; International Brands; Building Business Relationships; Successful Strategic Change; Job Satisfaction: A job satisfaction survey; Comparing Similarities and Differences Between Two Companies; Risk Management: Reputational risk; Crowdfunding; Customer Services; E-commerce; Team-building; Raising Finance; Customer Complaints; Crisis Management: Assessing risk; The Future of Management and Business.

**İNG 423 English Speaking Skills VII 4+0 2,0**

Pronunciation Activities: Stress, rhythm and intonation, First language and regional variation; Fluency Activities to Speak at Length with a Natural Effortless Flow; Studying Comprehension of Linguistic and Cultural Subtleties; Emergency Scenarios: Description of an emergency presented in a visual or an animation, Emergency prevention strategies, Emergency response procedures, Possible incidents.

**İNG 424 English Speaking Skills VIII 4+0 2,0**

Situational Awareness; Flight Preparation; Using Correct Phraseology; Understanding and Responding to International Accents; Discourse Management Strategies; Note-taking and Readback from Live ATC-Pilot Dialogues; Studying Clues of Verbal and Non-verbal Interactions Between Pilots and Air Traffic Controllers; Activities for Improving Ability to Communicate in Plain English to Make a Clear Contrast with the Phraseology Suitable for Routine Situations.

**İST 409 Mathematical and Statistical Methods in Decision Making 4+0 4,0**

General Information on Statistics; Descriptive Statistics: Tables, Graphs, Measures, Central tendency; Measures of Dispersion; Probability; Random Variables and Probability Distributions for Random Variables; Discrete Random Variable and Probability Distributions for Discrete Random Variables; Continuous Random Variable and Probability Distributions for Continuous Random Variables; Sampling; Sampling distributions; Point Estimation; Interval Estimation; Hypothesis Testing; Correlation; Regression; Some Nonparametric Tests.

**İSL 101 Introduction to Business 3+0 4,5**

Concept of business: Economic systems, Production factors, Needs and wants, Demand, Goods and services, Consumption and consumer; Success criterion: Efficiency and related concepts; Characteristics of Businesses: Goals and functions of businesses, Relationships with the environment and responsibilities of businesses, Grouping of businesses; Foundation of businesses: Foundation decision, Determining plant location; Extending Businesses; Business ethics and social responsibility ( Ethical and moral rules); Concept of management; Functions of management; Human resources management; Functions of human resources management; Principles of marketing.

**İSL 102 Management and Organization 3+0 4,0**

Management: Definition, Significance of Management for Business Enterprises; Development of Management Science: Classical, Behavioral and Modern Theories; Management Systems; Decision Making and Planning; Concepts of Authority and Power: Characteristics of Authority and Power, Delegation of Authority; Organization: Characteristics and Principles; Comparison of Organization and Planning Processes; Departmentalization; Staffing: Fundamentals, Staffing Process; Leading: Fundamentals, Leading Process; Organizational Structures: Development and Varieties of Organizational Structures; Controlling: Fundamentals and Controlling Process.

**İSL 301 Human Resources Management 3+0 4,0**

Human Resources Management: Development, Goals and Principles; Functions of Human Resources Management: Human resources planning; Recruitment, Performance Appraisal, Training, Orientation and Development; Wage and Salary Administration; Career Management; International Human Resources Management; Technology in Human Resources Management.

**İSL 352 Organizational Communication 2+0 3,0**

Definition and Significance of Organizational Communication; Functions of Organizational Communication; Organizational Communication Process; Channels of Organizational Communication; Communication Methods and Tools in Organizations: Organizational Communication and Managerial Function; Organizational Culture and Communication; Barriers to Organizational Communication; Developing Methods of Organizational Communication.

**İSL 406 Strategic Management 3+0 4,5**

Fundamental Principles of Strategic Management: Vision, Mission Strategy, Politics; Strategic Management in Corporations: Definition of strategic management, Principles of Strategic Management, Nature of Strategic Management; Fundamental Principles of Strategic Management; Strategic Management Processes; Strategic Management: Developments from 1960 to 1990; Process of Development in Strategy; Purposes of Strategy; Analysis of External Environment; Analysis of Corporate.

**İŞL 417 Management Information Systems 3+0 4,5**

Concept of Information Systems: Elements of Information Systems, Classifications of Information Systems; Information Systems in Business Management: End User Information Systems, Office Automation Systems, Electronic Communication Systems, Teleconference Systems, Electronic Printing Systems, Process of Image Systems; Business Information Systems: Marketing Information System, Production Information System, Human Resource Information System, Accounting Information System, Financial Information System; Decision Support Systems: Models of Decision Support Systems, Executive Information System, Artificial Intelligence and Expert Systems; Global Dimensions: Global Data, Security and Ethic Problems in Information Systems, Computer Crime.

**KÜL 199 Cultural Activities 0+2 2,0**

Participating Actively or as a Spectator in Sports Activities; Participating in Activities Arranged by the Counseling Center; Participating in Workshops in Art; Education on Museums; Participating in Art Trips; Participating in Cultural Trips; Participating in and Taking Duty in activities such as Cinema, theatre, scientific Meeting etc.; Taking duty in Clubs; Being a Student Representative and Participating in Environmental Activities.

**MAT 108 Linear Algebra and Analytic Geometry 2+0 3,0**

Vectors and Applications: Inner product of vectors, Outer product of vectors, Compound product of vectors; Vector Spaces and Subspaces; Planar Coordinates and Applications: Vertical coordinate system, Parallel and polar coordinate system; Coordinate Transformation on Plane; Matrices and Matrice Applications: Determinants; Addition, subtraction and multiplication of matrices, Special Matrices; Linear Algebraic Equations; Curve Drawings and Applications; Analytic Geometry in Space; Planes and Applications.

**MAT 119 Mathematics I 3+1 5,0**

The Rate of Change of a Function: Coordinates, Increments; Slope of a straight line and equations of a straight line; Functions and graphs; Behavior of functions; Slope of a curve; Velocity and rates; Limits: Theorems about limits, Infinity; Application of Limits; Derivatives: Polynomial functions and their derivatives; Rational functions and their derivatives; Inverse functions and their derivatives; Trigonometric functions and their derivatives; Natural logarithm and their derivatives; Exponential functions and their derivatives; Polar coordinates; Applications: Increasing or decreasing functions; Maksima and Minima theory and problems; Curve plotting; The mean value theorem; Rolle's Theorem.

**MAT 120 Mathematics II 3+1 4,0**

Integration: The indefinite integral, Applications of indefinite integration, Integration of trigonometric functions; Area under a curve; Definite Integral: Area between two curves, Distance, Volumes, Moments and center of mass; Work; Hyperbolic functions: Definitions, Derivatives and

integrals; Numerical methods for approximating definite integrals; Cylindrical and Spherical Coordinate Systems; Vector functions and their derivatives: Velocity and acceleration, Tangential vectors, Curvature and normal vectors; Infinite Series: Power series, Taylor's theorem, Application to max-min theory for functions of two independent variables.

**MAT 129 Mathematics I 2+0 4,0**

Set Systems of Number; Exponents and Radicals; Solutions of Inequality and Equation; Functions: Special functions and graph; Mathematical Induction; Sequence and Convergence; Limit; Continuity; Derivative Power; Formula; Chain Rule and High Order Derivative; Derivative of Special Functions; Maxima, Minima and Inflections; Economic Applications of Derivative; Plotting Curve.

**MAT 168 Mathematics 4+2 5,5**

Basic Mathematical Concepts: Fractions, Percentage, Decimals, Repeating decimals, Exponent and radical numbers; Number Sets; Ratio and Proportion: Speed and motion problems, Equation and inequalities, First and second degree equation and inequality, Solving sets of equations, Units of measurement; Geometric Shapes and Properties: Triangle, Circle, Polygons; Perimeter; Area; Volume Calculation; Function Concept: Types of function; Sequences; Limit Concept: Continuity concept.

**MAT 172 Mathematics II 2+0 3,0**

Integration: The definite integral, Properties of definite integral, Fundamental theorem of calculus, Areas of plane regions; Techniques of Integration: Change of variables, Integration by parts, Integration of rational functions; Applications of Integration: Applications of integral in economics; Multiple Integrals: Double and triple integrals; Matrix; Determinants; System of Linear Equations.

**MAT 208 Differential Equations 3+0 4,5**

Definition of Differential Equation: Solutions of differential equations; First Order and First Degree Differential Equations: Separable equations, Homogeneous differential equations, Linear differential equations, Exact equations; Higher Order Linear Equations With Constant Coefficients and Applications: Homogeneous equations, Non-homogeneous equations.

**MAT 801 Mathematics I 4+0 4,0**

Arithmetic Terms and Signs: Methods of multiplication and division, Fractional and decimal numbers, Measurements and conversions, Ratio and proportion, Means and percentages; Numbers; Sets; Functions; Simple Geometric Structures; Equation / Graphs of Functions; Simple Algebraic Expressions and Calculations: Addition, Subtraction, Multiplication and Division; Use of Brackets; Simple Algebraic Fractions; Logarithms; Simple Trigonometry: Trigonometric links, Use of tables, Sequences and series, Limits and continuity; Derivatives and Derivative Applications; Drawing graphics by using derivative; Ambiguous Figures and the L'Hospital Rule; Taylor's Formula.

**MAT 802 Mathematics II 4+0 4,0**

Integration: Definite integral, Fundamental theorem of differential and integral calculus, Areas of plane regions, Techniques of integration; Integration of Rational Functions, Trigonometric Integral, Improper Integrals, Integration Methods; Integral Applications: Volume, Arc length and Surface area; Multivariable Functions: Limits and continuity, Partial derivatives, Total derivative, Maximum and minimum; Double and Triple Integrals; Area and Volume.

**MAT 803 Linear Algebra 3+0 3,0**

Vector Spaces; Subspaces; Linear Dependence and Linear Independence: Finite Dimensional Vector Spaces (base (base) concept), Linear Transformations; Matrices; Matrices and Linear Transformations (Matrix representation of linear transformations); Linear Equations and Their Solutions; Indices and Exponential Expressions, Fractions and Negative Indices; Simultaneous Equations and Quadratic Equations with One Unknown; Systems of Linear Equations and Solution Methods of Linear Equations.

**MEK 110 Mechanics for Air Traffic Control 3+0 3,0**

Statics of Particles: Forces in the plane and space; Equivalent System of Forces; Equilibrium of Force Systems in a Plane; Equilibrium of Force Systems in Space; Kinematics of Particles: Linear and curvilinear motion of particles; Newton's Laws of Motion: Newton's 2nd law, Equations of motion, Dynamic equilibrium; Principle of Work and Energy; Principle of Impulse and Momentum; Kinematics of Rigid Bodies.

**MEK 112 Mechanis 3+0 3,0**

Nature of Matter: Chemical elements, Structure of atoms and molecules; Chemical Compounds; States of Matter: Solid, Liquid, Gaseous; Changes Between States; Forces, Moments and Couples, Representation As Vectors; Centre of Gravity; Elements of Theory of Stress, Strain and Elasticity: Tension, Compression, Shear, Torsion; Nature and Properties of Solid, Fluid and Gas; Pressure and Buoyancy in Liquids (Barometers).

**MEK 210 Fluid Mechanics 2+1 3,0**

Definition of Fluids; Continuum Hypothesis; Properties of Fluids: Specific gravity, Density, Viscosity, Surface tension, Compressibility; Fluid Statics; Fluid Flow; Streamlines: Streaklines, Pathlines; Types of Flow (steady, unsteady, laminar, turbulent, etc.); Control Volume and System Representation; Continuity Equation, Static, Dynamic and Total Pressures; Bernoulli Equation; Venturi Tube Flow; Fluid Resistance, Laminar and Turbulent Flows, Reynolds Number; Effects of Streamlining; Viscous Flow in a Pipe; Effects of compressibility on Fluids, Mach Number; Dimensional Analysis.

**MEK 312 Flight Mechanics 3+1 3,5**

Forces on Aircraft: Lift, Drag, Thrust and Weight; Steady State Flights and Performance: Steady level flight, Steady climbing flight, Steady descending flight, Steady gliding flight and Glide ratio; Coordinated Turn Maneuver; Effects of Load Factor: Stall, Flight envelope, Maneuvering

envelope and Structural limitations; Lift Augmentation; Stability: Active and passive, Longitudinal stability, Lateral stability, Directional stability.

**MLY 205 Public Finance 3+0 4,5**

Public Finance: Introduction, Chronology; Theoretical Approaches to Public Finance; Public Finance and General Economy; Functions of Public Finance; Allocation: Public goods, Semi-public goods, Private goods; Distribution of Income; Economic Stability; Public Expenditure: Definition, Classification, Causes of increase; Financing Government Expenditures; Taxation: Classification, Tax Burden, Tax Avoidance.

**MUH 151 Introduction to Accounting 3+0 4,5**

Concepts of Business and Accounting; Financial Transactions; Balance of Assets-Liabilities; Balance Sheet and Income Statement; Accounts: Concept of account, Types of accounts, Account chart; Document and Books; Accounting Process; Follow up Goods Transactions: Inventories and transactions of the purchase and sale of goods, Periodic inventory system, Perpetual inventory system; Liquid Assets: Cash, Banks, Checkups; Marketable Securities: Share certificates, Bonds; Receivables: Trade receivable, Other receivable; Long Term Assets; Liabilities; Shareholders Equity; Transactions of Income and Expenses; End of Period Transactions; Preparing Financial Statements and Closing Transactions.

**MUH 240 Cost and Management Accounting 4+0 5,0**

Introduction to Cost and Management Accounting; Cost Behavior and Cost Volume Profit Relationship; Variation of Cost Behavior; Introduction to Cost Management System; Cost Allocation and Activity Based Costing; Job Costing System and Process Costing Systems; Relevant Costs and Decision Making; Master Budget: Flexible Budgets and Variance Analysis; Management Control Systems and Performance Measurement.

**MUH 302 Analysis of Financial Reports 3+0 4,5**

Fundamental Financial Statements: Balance sheet, Income statement; Comparative Statements Analysis Method: Preparation of statements, Analysis and interpretation; Percentage Analysis Method: Preparation of statements, Analysis and interpretation; Trend Analysis Method: Preparation of statements, Analysis and interpretation; Fund Cash Flow Analysis: Preparation of statements, Analysis and interpretation; Change in Net Working Capital Statement: Preparation of statements, Analysis and interpretation; Ratio Analysis: Analysis and interpretation of liquidity, financial structure activity and profitability ratios.

**MÜZ 155 Turkish Folk Music 2+0 2,0**

Folk songs from different Regions of Turkey are Taught; Aegean Region Zeybek Folk Songs: Eklemedir koca konak, Ah bir ateş ver, Çökertme, Kütahya'nın pınarları, Çemberinde gül oya; Kars Region Azerbaijani Folk Songs: Bu gala daşlı gala, Yollarına baka baka, Dağlar gızı Reyhan, Ayrılık, Dut ağacı boyunca; Central Anatolian Region Folk Songs: Seherde bir bağa girdim, Uzun ince bir yoldayım,

Güzelliğin on para etmez, Mihriban ve Acem kızı; Southeastern Anatolian Region; Urfa and Diyarbakır Folk Songs: Allı turnam, Urfanın etrafı, Mardin kapısından atlayamadım, Fırat türküsü, Evlerinin önü kuyu; Blacksea Region; Trabzon, Rize, Artvin Folk Songs: Maçka yolları taşlı, Ben giderim Batuma, Dere geliyor dere.

**MÜZ 157 Traditional Turkish Art Music 2+0 2,0**  
Description of Traditional Art Music: Basic concepts, Characteristics, Types, Notes, Instruments; The Mode System of Traditional Turkish Art Music; The Rhythmic Pattern of Traditional Turkish Art Music; Samples from Different Modes; Samples from Different Rhythmic Patterns.

**NÜM 305 Quantitative Methods 3+0 4,5**  
System and system approximations; Decision Making Process and Models: Structure of Decision Problem, Decision Making Process; Decision environment: Certainty, uncertainty and Risk; Decision Models in certain environment; Linear Programing, Model Formulation, Linear Programing Solving Techniques: The Graphical and Simplex Techniques; Duality and Sensitivity Analysis; Transportation and Assignment Models; Network Analysis; Inventory Models; Game Theory.

**PLT 113 Principles of Flight 4+0 3,5**  
Subsonic Aerodynamics: Laws and definitions, Basics of airflow, Aerodynamic forces and moments, Airfoil and wing terminology, 2 dimensional flow around airfoil, 3 dimensional flow around aircraft, Ground effect, Stall phenomena, Boundary layers; High Speed Aerodynamics: Mach number, Compressibility, Shock waves, Divergence drag and its reduction; Stability: Static and dynamic stability; Control: Longitudinal directional and lateral control, Operational limitations: Flight, Maneuver and gust envelopes; Propellers; Flight Mechanics: Forces on aircraft, Steady level flight, Climb, Descend, Turn.

**PLT 114 Aircraft General Knowledge I (Airframe and Systems) 3+0 4,0**  
System Design: Design concepts, Loads, Stresses, Fatigue, Corrosion; Airframe Structure: Construction and attachment methods, Materials, Wings, Empenange, Fuselage, Doors, Windows; Hydraulic: Hydraulic fluids, System components; Landing gear: Types, System components, Nose wheel steering, Brakes, Wheels, Tyres; Flight Control: Primary flight control surfaces, Secondary flight control surfaces, Fly-by-wire; Pneumatic: Pressurisation, Air conditioning system; Anti-Icing and De-Icing Systems; Fuel System: Fuels, System components, Indications; Emergency Systems: Smoke detectors, Fire protection systems, Oxygen systems.

**PLT 115 Safety Management System I 2+0 1,5**  
Main Factors in Flight Safety: Man (Human), Medium (Environment), Maintenance; Main Factors of Incident/Accident: Man, Machine, Medium, Mission, Management; Reasons of Aircraft and Ground Incidents/Accidents: Flight crew, Aircraft, Meteorology,

Maintenance, Aerodrome, ATC, Others; Analysis of Incident/Accidents: Approach incident/accidents, Take-off/landing incident/accidents; Interface Between Man, Machine and Environment; Risk Factors: Human psychology/physiology, Personality and behaviors, Environment, Maintenance applications; Risk Managment: Flight and ground safety cautions, Basic concepts of flight and ground safety.

**PLT 117 Meteorology I 4+0 4,0**  
Atmosphere: Temperature, Pressure, Air density, Humidity, ICAO standard atmosphere; Wind: Local winds, General circulation, Turbulence, Jetstream, Wind shear; Clouds and Precipitation; Visibility: Runway visibility; Meteorological Events (Rain, Fog, etc); Air Masses and Fronts; Pressure Systems; Climatology; Flight Hazards: Icing, Turbulence, Inversions, Thunderstorms, Windshear; Meteorological Information: Weather charts, Weather reports (METAR, TAF, SPECI, TREND).

**PLT 118 Meteorology II 2+0 3,0**  
Visibility; Clouds; Thunderstorm: Flying in the thunderstorm; Turbulence: Types of turbulence, Flying in the turbulence; Icing: Types of icing, Icing during flight; Sigmet; Vhf Volmet Broadcasts; Prognostic Charts (Swc); Meteorological Cautions; Metar Aviation Routing Weather Report; Significant Current and Deduced Weather Forecast; Speci Aviation Selected Special Weather Report; Taf Terminal Aerodrome Forecast; Taf Amd Improved Aerodrome Forecast; Constant Pressure Charts.

**PLT 120 Aircraft General Knowledge II (Electrics) 1+0 1,0**  
Definitions and Basic Applications: Static electricity, Direct current, Alternating current, Resistors, Capacitors, Inductance coil, Permanent magnets, Electromagnetism, Circuit breakers, Semiconductors and logic circuits; Batteries: Types, Characteristics and limitations; Generation: DC generation, AC generation, Constant speed generator (CSD) and integrated drive generator (IDG) systems, Transformers, Transformer rectifier unit (TRU), Static inverters.

**PLT 122 Flight Operations 3+0 3,0**  
Requirements of ICAO Annex 6; Flight Operations; Performance and Limitations; Instruments, Equipment and Flight Documents; Communication and Navigation Equipments; Flight Crew; Security; Requirements of JAR-OPS; Air Operator Certification; Operational Procedures; Requirements for All Weather Operations; Instruments and Equipment; Communication and Navigation Equipment; Navigation Requirements for Long Range Flights; Flight Management; Transoceanic and Polar Flight; MNPS Airspace; Special Procedures and Hazards: MEL; De/Anti-Icing; Bird Strike; Noise Abatement.

**PLT 225 Aerodynamics 3+0 3,5**  
Basic Laws of Physics And Thermodynamics Related To Aerodynamics; Atmosphere; International Standard Atmosphere; Bernoulli's Principle; Airspeed Measurement;

Introduction To Compressible Flow; Airfoils; Lift Theories; Boundary Layer; Drag; Wings; Aerodynamic Characteristics of The Wings; Stalls; Drag Polar; High Lift Devices; Compressibility Effects On The Aircraft Aerodynamics.

**PLT 239 Aircraft General Knowledge III** **2+0 3,0**  
(Aircraft Engines)

Piston Engines Principles: Engine cycles; Engine Construction; Mechanic, thermal and volumetric efficiencies; Power Calculations; Factors Affecting Performance; Classification of Piston Engines; Fuel and Fuel Systems; Start and Ignition Systems; Lubricants and Lubricating System; Engine Instruments; Gas Turbine Engine Principles: Engine Cycle; Engine Construction: Air Inlet, Compressor, Combustion chamber, Turbine, Exhaust; ; Fuel and Fuel Systems; Start and Ignition Systems; Lubricants and Lubricating System; Engine Instruments; Auxiliary Power Unit.

**PLT 240 Avionics I** **12+0 1,5**

KMA 24 / 28 Audio Nav/Comm Control Panel; KX 155/ 165 KY 196A/197 King/Nav Com System; Frequency Selection, Activating; KAP 140 Otopilot and Flight Control System; KR 87 Digital ADF: Station defining, System check; RMI Radio Magnetic Indicator Course Deviation Indicator; KT 76 A / 76C Transponder; KMD 550 MFD Multi Function Display; KN 62 A DME Distance Measuring Equipment; KCS 55 A HSI Horizontal Situation Indicator; OBS Omni Bearing Selector; KLN 89B/ 94 GPS Navigation System Indicator.

**PLT 242 Normal Procedures I** **18+0 1,5**

Familiarization to Flight; Preflight Preparation and Checks; Checklist Following and Operating Procedures; Preflight Inspections; Before Starting Engine Checks; Starting Engine Checks; Before Taxiing Checks; Taxiing Checks; On Holding Point (engine run up) Checks; Before Take-off and Take-off Checks; Climb, Cruise and Descend Checks; Traffic Circuit Pattern, Downwind and Before Landing Checks; After Landing Checks; Engine Shut-Down and Securing Procedures.

**PLT 244 Emergency Procedures I** **18+0 1,5**

Airspeed for emergency operation; Engine failures: Engine failure during takeoff roll, Engine failure immediately after takeoff, Engine failure during flight (restart procedures); Forced landing; Emergency landing with or without engine power; Fires; During start on ground or in flight, Electrical fire in flight, Cabin and wing fire; Icing: Static source blockage; Landing with a flat main or nose tire; Electrical power supply system malfunction: Ammeter's indication of excessive rate of charge, Low voltage annunciator (volts) Illumination during Flight; Vacuum system failure; Radio failure in flight; Light signals and meanings given from the tower.

**PLT 247 General Navigation** **5+0 5,0**

-Basics of General Navigation: The Solar System; The Earth: Great Circle; Rhumb Line; Conversion Angle; Latitude and Latitude Differences; Longitude and Longitude Differences;

Time: Types Of Time; Conversion Of Time To Arc and Vice Versa; Directions: Kinds Of Direction; Variation; Deviation; Calculating Direction; Distance: Conversion From One Unit To Another; Finding Distance on Latitude/ Longitude; Plotting; Magnetism And Compasses; Charts: Scale; Representative Fraction; Factors Of Dead Reckoning Navigation (DR): Track; Heading; Speed; Wind velocity And Drift Time; Using Flight Computer In-flight Navigation: Take-Off; Climb; Cruise; Decent; Off Track Corrections.

**PLT 251 Human Performance and Limitations 4+0 4,5**

General Concept of Human Factors in Aviation; Human Factors in Aircraft Accidents; Aviation Physiology; Atmosphere; Respiratory and Circulatory Systems; Hypoxia and Hyperventilation; Man and Environment: Sensory System; Central and Peripheral Perception Systems; Vision; Basic Functions and Parts of Eye; Visual Problems During Day and Night; Equilibrium; Spatial Disorientation; Perception System; Nutrition; Hygiene; Health Care: Harmful effects of tobacco and alcohol in aviation; Self Imposed Stress, Incapacitation in Flight; Crew Resource Management.

**PLT 253 Air Traffic Communication I** **2+0 4,5**

Radio technics phonetic alphabet and mors codes; How to say numbers, time system abbreviations; Standard phraseology standard words and definitions; call signs, type of call signs; correction, read back - frequency change; radio check; engine start up procedures and taxi instructions; Take off clearance enroute procedures; position reports; flight level or altitude; Approach and traffic pattern procedures, runway vacating after landing; radio failure, transponder procedures; distress communications, urgency communications.

**PLT 255 Aircraft General Knowledge IV (Flight Instrument)** **3+0 4,0**

Pitot-Static Instruments: Pitot-static heads, Air speed indicator, Pressure altimeter, Vertical speed indicator, Machmeter; Magnetism and Magnetic Compass: Magnetism, Magnetic compass, Aircraft magnetism; Gyroscopic Instruments: Gyroscopic principles Gyro types, Directional gyro, Attitude indicator, Turn and slip indicator, Turn coordinator, Slave gyro; Inertial Navigation Systems: INS, IRS; Air Data Computer; Engine Instruments: Grouping, Thrust indicators, Torque indicators, Tachometers, Temperature indicators, Pressure indicators.

**PLT 257 Radio Navigation I (Basic Radio Aids) 4+0 5,0**

Radio Wave Theory: Frequency, Wavelength, Amplitude, Phase, Frequency bands, Modulation, Antennas, Wave propagation; VDF (VHF Direction Finder); ADF (Automatic Direction Finder); VOR (VHF Omni Range); DME (Distance Measuring Equipment); ILS (Instrument Landing System); MLS (Microwave Landing System); RADAR: Working principle, Weather radar, Radar altimeter, PSR (Primary Surveillance Radar), SSR (Secondary Surveillance Radar); GPWS (Ground Proximity Warning System); TCAS (Traffic Collision Avoidance System).

**PLT 260 Introduction to Aircraft Types I 24+0 3,0**

General: Engine, Propeller, Fuel, Oil, Hydraulic; Limitations: Speed symbol and terminology; Emergency Procedures: Practical speed/examples; Normal Procedures: Practical speed; Standard Performance Graphics and its Use; Weight and Balance: Filling weight and balance sheet; Equipment List: Compulsory and noncompulsory equipment; Definition and Application of Aircraft and its Systems: Wing, Fuselage, Engine, Avionics, Aircraft ground and maintenance services (Cross Country Applications).

**PLT 262 VFR Navigation and Flight Planning 18+0 3,0**

Basic Concepts of VFR Navigation: Performance chart of cessna; Computer Use on VFR Navigation; Dead Reckoning; Fulfilling and Using Flight Log; Fulfilling VFR Flight Plan; Finding Radial by VOR and ADF; VFR Navigation Planning and Application; Control Zone and Service; Responsibilities of Pilots; Finding Direction by Radio Waves; Chart Reading Methods in Navigation; Studies of SOP in Terms of Navigation.

**PLT 264 Standard Operation Procedures I 30+0 2,5**

Aircraft Logbook Inspection; General Fuselage Condition Checks; Analysis of Aircraft Failures; Exceptional Flight Procedures; Oil and Fuel Check; Preflight Inspection; Use of Checklist; Before Starting Engine Checks; Communication Procedures; Checks of Controls; Starting Engine and Checks; Flight Safety Precautions; Determination of Primer; Recovering from Abnormal Situations; Lazy 8; Simulated Forced Landings; Cross Country Procedures; Homing with ADF; Straight-in Approach Procedures; Radio Failure in Flight; Landing and Take-off Procedures with/without Flaps; Stop and Go Procedures.

**PLT 266 Safety Management System II 18+0 2,0**

Stress Management; Environmental Stress Factors and Their Effects; Mental and Physical Health; Time Limitation for Mission and Flight; Behaviors of Passenger and Typical Passenger; Effects of Natural Events in Flight Safety; Vortex; Distance Clearance Between Aircraft: Suggestion of ICAO and NTSB; Runway and Hydroplaning; Slippery Runways and Accidents; Windshear/Microburst; Bird Hazard and Avoidance Techniques; High Voltage Lines; Other Environmental Factors (Electromagnetic Interference/EMI).

**PLT 268 Practice in Flight I 0+15 3,5**

Familiarization with Flight and Aeroplane: Engine start, Taxi, Take-off, Climb, Entering to training areas, Flight controls, Communication with control tower; Training Area Procedures: Protection of training area, Air maneuvers, Emergency procedures, Leaving training area; Traffic Pattern: Downwind, Base leg, Final approach and landing; After Landing Procedures: Parking, Engine shutdown.

**PLT 270 Practice in Flight II 0+46 7,0**

Familiarization of Flight and Aeroplane: Engine start, Taxi, Take-off, Climb, Entering to training area, Flight controls, Communication with control tower; Training Area Works: Keeping of training area, Air maneuvers, Emergency

applications, Leaving training area; Traffic Pattern: Downwind, Base leg, Final approach and landing; After Landing Procedures; Traffic Pattern and Training Area Works: Dual command and solo traffic patterns, Dual command and solo air maneuvers, Flight controls, Emergency applications.

**PLT 272 Practice in Flight III 0+24 4,5**

General Applications: Ground operations, Take-off, Climb, Leaving traffic pattern, Transition to cruise, Cruise flight, Keeping of training area, Descent, Entering traffic, Traffic pattern, Base leg/final, Missed approach, Landing, Flight controls, Outside control, Using trim tab, Radio applications, Emergency applications; Air Maneuvers: Normal and shallow bank turns, Steep turn, With/without thrust/characteristic stalls, Slow flight, Chandelle, Lazy 8, Spin prevention, Forced landing.

**PLT 336 Emergency Procedures II 15+0 1,5**

Pitot-Static System Failure: Maximum gliding distance without engine power, Landing emergencies; Recovering from Spin; Ditching; Proposing Recovery; Alternator Failure; Communication Failure; Warning Lights from Tower; Rejecting Take-Off; Recovering from Abnormal Situation; Forced Landing; Landing gear malfunction.

**PLT 338 Normal Procedures II 15+0 1,5**

Preflight Internal and External Inspection; Reading Checklist Procedures; Before Start-up Controls; Before Taxi Controls; Holding Point and Before Line-up Controls; Line-up; Take-off; Climbing; Setting Level Flight and Controls; Procedures of Training Areas;

**PLT 342 Air Traffic Communication II 12+0 1,5**

IFR Communications: General operational procedures, Meanings and importance of related terms, Usages of letters and numbers, Ways of transmitting time, Techniques of radio communication, Explanation of abbreviated radio call signs, Abbreviations of Air Traffic Control, Radio communication failure procedures, Distress and urgency procedures, Fixing of radio navigation stations by their morse codes.

**PLT 344 Mass and Balance 30+0 4,5**

Mass and Balance Considerations: Mass limitations, Centre of gravity limitations; Loading: Mass and load terms, Mass limits, Structural limitations, Performance limitations and cargo limitations, Mass calculations; Fundamentals of CG Calculations: Definition of CG, Balance, Basic calculations of CG; Mass and Balance Details of Aircraft: Contents of mass and balance documentation, Determination of aircraft empty mass and CG position by weighing, Extraction of basic empty mass and CG data from aircraft documentation.

**PLT 348 Performance 40+0 5,0**

Performance Legislation: Airworthiness requirements, Operational regulations; Performance Theory: Stages of flight, Steady flight, Climb, Descent, Range and endurance, Take-off and landing, Influencing variables on performance; Class B Single-Engine Aeroplanes: Speed definitions, Effect of variables on single-engine aeroplane performance; Class

A Aeroplanes Certificated Under CS-25; Aircraft Classification and Pavement Classification Numbers; CS-25 Speed Definitions: Take-off, Take-off distances, Accelerate-stop distance, Balanced field length concept, Unbalanced field length concept, Take-off climb.

**PLT 350 Radio Navigation II (Radar, RNAV) 28+0 5,5**

Basic Principles of Radar; Ground Radar: Principles, Use of radar in air traffic control service; Radar Services; Radar Identification Procedures: PSR and SSR; Radar Vectoring, Speed control, Separation applications; Transponder: Principles, Mode and code, Basic monitoring; Area Navigation Procedures: RNAV: BRNAV, P-RNAV, RNP-RNAV, 2D RNAV, 3D RNAV and 4D RNAV principles; Navigations Computers.

**PLT 352 Basic Instrument 18+0 4,5**

Blind Cockpit Check; Checklist Procedure; Climb; Cruise; Power Settings; Speed Change; Turns; Constant Rate Maneuvers; Constant Speed Maneuvers; ADF/VOR Homing; Trim Technique; Configuration Changes; Cross-Check Technique; Timed Turns; Stalls; Unusual Attitudes Exists; Partial Panel Flying; 'S' Maneuvers; A/B Patterns; Uses of Flight Instrument as Stand-by or Main.

**PLT 354 Radio Navigation III (FMS) 18+0 6,0**

Flight Management System and General Terms: Navigation and flight management, Flight management computer, Navigation data base, Performance data base, Typical input/output data from the FMC, Determination of the FMS position of the aircraft; Typical Flight Deck Equipment Fitted on FMS Aircraft: Control display unit, EFIS instruments, Typical mode of the navigation display; Global Navigation Satellite Systems: GPS/GLONASS/GALILEO principles, Operation, Errors and factors affecting accuracy.

**PLT 356 Flight Planning and Monitoring 48+0 7,5**

Computation of Estimated Time En Route and Total Fuel Requirements Based on Such Factors Such as Power Settings: Operating altitude or flight fuel and wind; Fuel Reserve Requirements; Selection and Correct Interpretation of the Current and Applicable En Route Charts; SIDS; STARS and Instrument Approach Charts; Explaining NOTAM Information; Determining Required Performance of the Aircraft and Operating Limitations; Preparation and Filing VFR; IFR Flight Plan; Weather Information Pertinent to the Proposed Route of Flight and Destination; Rules for the Alternate Routes and Destination.

**PLT 358 Introduction to Aircraft Types II 24+0 3,0**

General: Engine, Propeller, Fuel, Oil, Hydraulics; Symbols; Abbreviations and Terminology; Limits: Speed, Power plant, Weight and maneuvering limits; Emergency Procedures; Normal Procedures: Application procedures, Standards; Performance Charts: Weight and balance, Definitions, Aircraft handling services and maintenance; Day and Night IFR Equipment; Night VFR Equipment; De-icing Systems; Autopilot (KFC 150 and KAP 150); Ground Power Receptacles.

**PLT 360 Standard Operation Procedures II 15+0 1,5**

Aircraft Logbook Inspection; External and Internal Preflight Checks; Starting Engine; Take-off and Entering Training Areas; Climb; Straight and Level Flight; Descent; Leaving Training Areas and Traffic Pattern; Missed Approach; Touch and Go; Crosswind Take-off; Landing; Configuration Changes; Speed Changes; Slow Flight; Steep Turns; Stalls; Calculation of Approach Speeds; Gear Extending in Emergency Landing; Blind Cockpit Control; Recovering from Critical Flight Attitudes.

**PLT 362 Practice in Flight IV 0+20 7,0**

Flight Preparations: Blind cockpit control; Checklist Applications; Take-off; Climb; Transition to Straight and Level Flight; Straight and Level Flight; Power Adjustments; Airspeed Changes; Turns; Constant Rate Maneuvers; Trimming; Constant Speed Maneuvers; Level Turns; Climb and Descent Turns; ADF/VOR Homing; Configuration Transformations; Timed Turns; Crosscheck; Stalls; Unusual Attitude Recovery; Partial Panel Flying; 'S' Maneuvers; A/B Patterns; Primary and Secondary Instruments; Steep Turns; Emergency Procedures; Radio Communications; Point Designation; Alternate Aerodrome Applications.

**PLT 364 Safety Management System III 12+0 1,5**

Crises Management; Management of Change; Safety Cultures; Planning and Organisation in SMS; The Effects of Natural Events to Flight Safety; Wing Edge Vortex; Separations Between Airplanes; Windshear/Microburst; Bird Hazard and Avoiding Procedures; High Voltage Lines; Thunderstorms and Associated Hazards; Turbulence and Clear Air Turbulence; Sandstorm; Flight Operation in Volcanic Ash; Icing; Icing Classifications and hazards.

**PLT 366 Radio Instrument and Radio Instrument Cross Country 30+0 4,5**

Homing; Front and Back Course Interception; Reversal Procedures; Time; Fuel Calculation; Point Designation; Alternate Aerodrome Procedures; SID; Partial Panel; Circling Approach; Crossing Station; Holding; Entering; Drift and Time Correction; Intersection; RNAV; Approach; Maintaining Route to NAV Point; ASR Applications; DME Arc: Entering, Leaving; Maintaining; ILS Approach; Missed Approach.

**PLT 368 Simulator Application I 0+15 5,5**

Ground Preparations: Blind cockpit checklist applications; Take-off; Climb; Transition to Straight and Level Flight; Straight and Level Flight; Power Adjustments; Airspeed Changes; Turns; Constant Rate Maneuvers; Trimming; Constant Speed Maneuvers; Constant Rate Maneuvers; Level Turns; Climb and Descent Turns; ADF/VOR Homing; Configuration Transformations; Timed Turns; Crosscheck; Stalls; Unusual Attitude Recovery; Partial Panel Flying; 'S' Maneuvers; A/B Patterns; Primary and Secondary Instruments; Steep Turns; Emergency Procedures; Radio Communications; Point Designation; Alternate Aerodrome Applications.



**PLT 370 Practice in Flight V 0+16 6,0**

Ground Preparations; SID Applications; Straight and Level Flight; Bracketing-Tracking; Reciprocal Tracking; Holding Entrance; Wind Corrections; Time Corrections; VOR/DME Procedures; Circle to Land; Missed Approach; ASR Applications; Partial Panel; Time and Fuel Consumption Calculations; RNAV Applications; DME Arc Applications; ILS Procedures; Crosscheck; Instrument Approaches; Diversion Procedures.

**PLT 372 Simulator Application II 0+14 4,0**

Ground Preparations; SID Applications; Straight and Level Flight; Bracketing-Tracking; Reciprocal Tracking; Interscepts, Time and distance, Crossing station, Holding entrance, Crosswind corrections, Time corrections, VOR, VOR/DME, ADF approach procedures, Circle to land, Missed approach, ASR applications, Partial panel, Time and fuel consumption calculations, RNAV applications, DME/ARC applications, Maintaining the ARC, ILS approach procedures, Crosscheck, Instrument approaches.

**PLT 374 Practice in Flight VI 0+22 6,0**

Flight Preparations: Blind cockpit check, Take-off; Climb; Cruise Flight; Power Settings; Maneuvers; Speed Changes; Constant Speed Maneuvers; Constant Rate Maneuvers; Climb and Descent Turns; ADF/VOR Homing; Configuration Changes: Timed maneuvers; Ground Preparations: Signal and S/S system controls, Usage, IFR procedures before flight, ATC read-back, Take-off briefing, ASR (SID) applications, Flight log preparations, SID application, Flight controls, Point designation.

**PLT 387 Instrument Flight Charts 18+0 2,5**

Introduction of Instrument Flight Charts; Briefing Bulletin; Chart NOTAMs; Area and Terminal NOTAMs; Enroute Procedures; Radio and Navigation Equipment; Limitations and Codes; Conversion Tables and Codes; Air Traffic Control; Entrance Requirements; Visa and Passport Procedures; Emergency Procedures; Aerodrome Guide; Airfield Information.

**PLT 388 Simulator Application III 0+8 2,0**

Ground Preparations: Radio and navigation systems check, Air traffic communication read-back, T/O briefing, Standard instruments departure applications, Bracketing-tracking, Flight control, Point designation, Altimeter procedures, Time and fuel calculations, Descent briefing, Holding procedures, Instrument approach procedures, Missed approach, Circle to land, Radio communications.

**PLT 422 Multy Crew Cooperation (MCC) 25+0 3,5**

Definitions; Air Traffic Control and Cabin Crew Communication; Crew Resource Management Program (CRMP); Preflight Preparation; Practical Training in Cockpit; Flight Line Activities; Situation Awareness (SA); Personnel Behavior; Explanation of Situation; Perception and Reality; Loss of Consciousness; Cabin Crew Behaviors Leading to Problems; Decision Making; Types of Personality and Attitude; Flight Management; Communication Methods;

Check-list Practice; PIC/PNIC Flight and Missions; Mission and Responsibilities in Applying Emergency Procedures.

**PLT 447 Avionics II 30+0 4,0**

Primary Flight Displays (PFD); Multifunction Flight Display (MFD); Display Control Panel (DCP); Reversionary Panel (RP); Radio Tuning Unit (RTU); Control Display Unit (CDU); Cursor Control Panel (CCP); Secondary Flight Display System (SFDS); Flight Guidance Panel (FGP); Audio Panel; WX Radar; Cockpit Voice Recorder (CVR). All sistems Advisory, Warnings and Cautions messages.

**PLT 456 Night Flight 12+0 3,0**

Prerequisites in JAR-OPS, Annexes(2, 6, 8) Eye's Anatomy and Physiology; Effect of Light on Eye; Main Factors for Seeing Visual Illumination Adaptation to Dark. Factors on Dark Vision; The Techniques for Good Night Vision; Illumination and Lighting System; Runway Lights System; Approach Lights System; Light Being Used on Radio Failure(Lightgun signals); General Decisions Being Held by SHYO.

**PLT 460 MCC Simulator Application 0+15 4,5**

Before T/O Checks Including Powerplant Checks; T/O Briefing by PF; Rejected T/O; Crosswind T/O; Engine Failure After VI; Selected Emergency Procedures to Include Engine Failure and Rapid Decompression; Windshear During T/O and Landing; Emergency Descent; Incapacitation of a Flight Crew Member; Instrument Flight Procedures Including Holding Procedures; Precision Approaches Using Raw Navigation Data; Flight Director and Automatic Pilot; One Engine Simulated Inoperative Approaches; Non-precision and Circling Approaches; Approach Briefing by PF; Setting of Navigation Equipment; Call-out Procedures During Aapproaches; Computation of Approach and Landing Data.

**PLT 462 Normal Procedures III 18+0 3,0**

Airspeeds for Safe Operation; Procedures by Flight Phase: Preflight Inspections, Before Engine Starting, Engine Starting (Battery and External Power), Engine Clearing, Before Taxi and Taxi, Before Takeoff, Takeoff, Climb, Cruise, Icing Conditions, Descent, Before Landing, Normal Landing, After Landing, Shutdown and Securing; Other Procedures: Oxygen Duration, Cold Weather Procedures, Icing Flight, Traffic Alert and Collision Avoidance System, Using Ground Communications Power; Air Start; Systems; Cracked or Shattered Windshield; Crack in Any Side Window (Cockpit or Cabin); Severe Icing Conditions; Avionics.

**PLT 464 Emergency Procedures III 12+0 1,5**

Emergency Airspeeds; Engine Failure: Emergency Engine Shutdown, Engine Fire on Ground, Engine Failure in Flight; Fuel System; Smoke and Fume Elimination; Cabin Door Unlocked; Emegency Descent; Glide; Electrical; Flight Controls; Environmental Systems; Emegency Exit; Spins; Avionics: Autopilot Failures, Electric Pitch Trim Inoperative, Flight Display Failure Flags, Terrain Awareness Warning System.

**PLT 468 Introduction to Aircraft Types III 24+0 1,5**

Engine Systems: Generator and electrical load limits, Temperature limits; Fuel System: Fuel system schematics, Fuel pump operation; Oil System: Types of oil used, Oil system schematics, Oil pumps and operation, Temperature limits; Starter System: Starter limits; Propeller System; Airspeeds: Straight and level flight, Climb and descent airspeeds; Maximum Weights: Maximum take-off, Landing and loading weights; Maximum Load Coefficient; Fuselage System.

**PLT 470 Standard Operation Procedures III 18+0 3,0**

Preflight Inspections; Start-up; Taxi Controls; Before Take-off Controls; Line up and Take-off; After Take-off Controls; Straight and Level Flight; Descent and Approach Controls; Traffic Pattern; Landing; Missed Approach; After Landing Controls; Engine Shut-Down; Climb: Performance setting, Turns, Airspeed restrictions, Straight and level flight, Performance settings, Use of Pilot Operation Handbook (POH); Normal and Steep Turns; Airspeed Changes; Restrictions; Descent.

**PLT 472 Practice in Flight VII 0+11 6,0**

Preflight Preparation Check-list; Take-off; Climb; Cruise Flight; Normal Turns, Steep Turn; Series of Stalls; Speed Changes; Configuration Changes; Slow Flight; Single Engine Training; Descent; Entering Traffic Pattern; Emergency Descent; Traffic Pattern; Final Approach; Landing; Using FD and AIP; Fletner Technique; Radio Procedures; Emergency Procedures; Crew Cooperation; Using S/S System; ATC Readback; SID Procedures; ASR Procedures: Point designation, Flight planning, Calculating time/fuel, Descent briefing, Holding, Instrument approach procedures, Circle to land.

**PZL 210 Customer Relations 2+0 3,0**

Concept of Customer Relations Management; Customer Value and Customer Classification; Customer Relations Process; Customer Services Quality and Control; Customer Complaints; Customer Loyalty: Reaching customers and customer retention programs; Role of information technology: Using information, Database marketing, Sale force automation; Customer Relations Management and Internet; Analysis and Planning Process in Customer Relations Management; Integrating Customer Relations Management and Company Strategies; Management of Customer Oriented Change.

**PZL 302 Marketing Management 3+0 4,5**

Concept of Marketing; Evolution of Marketing; Functions of Marketing; Environmental Conditions of Marketing; Marketing Information Systems and Marketing Research; Market Concept; Market Segmentation and Target Market Selection; Customer Behavior in Industrial Markets; Product; Price; Distribution Channels and Physical Distribution; Sales Promotions; International Marketing.

**PZL 410 Airline Marketing 2+0 3,0**

The Marketing Concept; The Market for Air Transport Services; Airline Industry-Marketing Environment; Airline

Marketing Strategy; Product Analysis for Airlines; Problems of Pricing; Distribution of Product; Selling The Airline Product; Policies of Advertising and Promotion; Total Quality Management.

**SAĎ 102 First Aid 2+0 2,5**

Social Importance of First Aid; Aims of First Aid; Precautions To Be Considered by The One Who Will Apply First Aid; Human Body; First Aid Materials; Strangulations and Supplying Respiration; Stopping Bleedings and Supplying The Blood Circulation: External and internal bleeding signs and first aid, Recognition of blackout of consciousness and first aid, Shock causes and recognition of shock related to bleeding and first aid, Coma degrees and first aid, First aid in heartbeat stopping, Applying cardiopulmonary resuscitation (CPR) and artificial respiration together; Injury Types and First Aid; Burn and Boils; Fractures, Dislocations and Spraining; Poisonings, Freezing, Hot and Electric Shocks; Communication; Preparation of Injured Person for Carrying and Carrying Types.

**SAĎ 401 First Aid 18+0 3,0**

Description of health; General factors threatening health; Metabolism of human; How our organs work and how they get ill; Ways of protecting from illness; General information of rehabilitation and treatment; Way of the protecting from contagion and terminal illnesses; Harmful habits and their effects of health; First aid for accidents and illnesses; Description, aims and practice of first aid; Basic approaches and mission of first aid man; First aid practices of bleeding, broken (arms, legs etc.), weather worn, boiling, freezing, sunstroke, to be poisoned, choking, problems of respiratory and cardio.

**SAN 155 Hall Dances 0+2 2,0**

Basic concepts. The ethics of dance, Dance Nights, Dance Costumes, National International Competitions and rules/grading, Basic Definitions, Classifications of Dances: Social Dances; Salsa, Cha Cha, Samba, Mambo, Jive, Rock'n Roll, Jazz, Merenge; Flamenko, Rumba, Passa -Doble, Argentina tango, Vals, Disco, Quickstep, Foxtrot, Bolero, European Tango: Ballroom Dances; Sportive Dances; Latin American Dances; Samba, Rumba, Jive, Passa-Doble, Cha Cha, Standart Dances; European Tango, Slow vals (English), Viyana vals, Slow foxtrot, Quickstep.

**SER 246 Fundamentals of Ceramics 3+0 3,5**

Fundamentals: Description of ceramics and clay, materials used for shaping clays; Different Types of Clays: Red clay, grogged clay; Hand Shaping Methods; Basic Ceramics Terminology and Technical Knowledge About Clays; Two and Three Dimensional Hand Shaping; Vase, bowl, cylinder, pot, ashtray, dish, etc.; Biscuit Firing; Glazing: Glazes, different type of glazing techniques; Glaze Firing; Discussion About The Ceramics Forms; Slide shows; Visit to Fine Art Faculty Ceramics Department.

**SHU 101 Introduction to Civil Aviation 2+0 3,5**

Historical Development of Civil Aviation in World; Definition of Civil Aviation; Civil Aviation Activities; International Civil Aviation System: Conventions, Organizations, Regulations, Bilateral agreements, Air traffic rights; National Civil Aviation Regulations: General and commercial aviation; National Civil Aviation System; Airports: Definition and facilities, Airside and landside, Terminal design; Air Transportation in World and Turkey: Privatization, Mergers and alliances.

**SHU 102 Meteorology 3+0 5,5**

Atmosphere; ICAO Standard Atmosphere; Pressure: Pressure systems, QFE, QNH, QNE; Temperature; Humidity; Wind: Direction and speed units, General circulation, Monsoon cyclone; Visibility: Runway visibility; Clouds: Types of clouds, Amount of clouds, Ceiling; Meteorological Events (rain, fog, etc); METAR; Trend Type Runway Landing Forecast; SPECI; Coding Examples: TAF, AMD, Reading examples; Tropopause; Thunder Storms and Flying in Thunder Storms? Turbulence; Wind Shear; Jet Stream; Inversion; Advection, Icing and Its Effects on Aircraft; Air Mass; Front; Important Air Charts; Flight Forms.

**SHU 103 Flight Theory 2+0 3,5**

Theory of Flight: Aerostatics, Aerodynamics; Basic Aerodynamics: Physical characteristics of air, Standard atmosphere, Airflow-airflow regions, Components of aerodynamic force, L/D ratio; Wing: Geometrical, structural and aerodynamic characteristics, Wing configurations, Flaps; Fuselage: Geometrical, structural and aerodynamic characteristics; Landing Gear: Types and components; Flight Control Surfaces: Primary flight control surfaces, Tabs; Aircraft Power plant: Reciprocating engines and propeller, Gas turbine engines.

**SHU 108 Air Transportation 3+0 3,0**

Transportation Systems; Description And Comparison Of Transportation Subsystems; Air Transportation; Structure of Air Transportation; Economic and Social Effects and Benefits of Air Transportation; Components of Air Transportation; Airlines; Airports; Aviation Services; Legislative and Regulatory Bodies and Aviation Authorities; Customers; Regulations in Commercial Air Transportation; Economic Regulations; Technical Regulations; JAA/EASA Regulations; Regulations in Turkey; Air Transportation in the world; Air Transportation in Turkey.

**SHU 110 Meteorology 3+0 3,0**

Atmosphere, Pressure and Pressure Systems (Depressions, Anticyclones), Altimetry, Temperature, Humidity, Stability, Turbulence, Winds and Upper Winds, Stability and Instability, Air Masses, Fronts (Cold Fronts, Warm Fronts, Occlusions), Global Circulation, Cloud Formations and Precipitations, Thunderstorms, Visibility (Fog, Haze, Smog), Icing, Weather Charts, Weather Documentations (METAR, TAF, TREND, SPECI).

**SHU 111 Sustainability in Airport Operations 2+0 2,0**

Sustainability Approach; Future Targets in Aviation; European Aviation Targets, American aviation targets, Green airport; Environmental Management in Aviation; Noise, Waste management, Influence of Climate Change in Aviation; New Generation Fuels, Emissions, Environmental aircraft engines, Environmental sustainability practices in aviation; Social Sustainability Practices in Aviation.

**SHU 205 Management Statistics 3+0 4,0**

Introduction to Statistics: Description and content of statistics, Classification and representation of data with graphics, Means, Variation measurement, Asymmetric and skewed measurements, Ratios, Fixed variable, Simple and combined indices, Concept about sampling, Sampling techniques, Estimation of sample mean and ratio confidence intervals, Estimation of sample mean and ratio difference confidence intervals; Hypothesis Testing: Null hypothesis, Alternative hypothesis, Type I error, Type II error, Hypothesis testing for one population; Small Sample Theory; Student Distribution, Chi-Square Independence and Homogeneity Tests.

**SHU 213 Flight Operations 3+0 4,5**

Basic Flight Management Principles; AIP and Its Sections; Flight Plan; Meteorological Services for International Air Navigation; Effective Weather Events; Information and Services for Airlines and Flight Crews; Aerodrome Management Rules and Minimum Required Responsibilities; Take-off and Landing Performances; Factors Effective in Take-off and Landing; Flight Management Control, Dispatch Responsibilities; Dispatch Release and Dispatch of Flight; Fuel Planning Principles; Airport Selection and Use.

**SHU 217 Airport Operations and Equipment 3+0 4,0**

Concept of Airport: Airside facilities and equipment; Landside Facilities and Equipment; PAT Area: PAT area of marking and lighting; Runway Pavement and Methods of Calculation; Declared Distances and Calculations; Instrumental Runways and Specifications; Obstacles: Obstacle limitation surfaces; Visual Aids to Determine Obstacles; Activities of Obstacle Control; Airport Planning: Airport master planning; Layout of Airside and Landside Facilities; Airport Operations: Airport service process; Activities for Conservation of Surface Deposition Conditions; Rescue and firefighting; Wildlife Control and Reduction.

**SHU 219 Navigation and Navigation of Aids 3+0 4,0**

Fundamentals of Radio Waves; VDF and ADF Systems; VOR (VHF Omnidirectional Range); DME (Distance Measuring Equipment); ILS (Instrument Landing System); MLS (Microwave Landing System); Radar Systems; GPWS (Ground Proximity Warning System); TCAS (Traffic Alert and Collision Avoidance System); GNSS (Global Navigation Satellite Systems); FMS (Flight Management System); RNAV (Area Navigation); CNS-ATM Concept; Navigation Methods; Types of Maps; Calculation of Distance Between Two Points; Estimation of Positions on

Map and Reading of Map; Effect of Wind on Flight Course and Speeds Used in Aviation.

**SHU 222 CRS Applications 3+0 4,0**

Basic Concepts; Global Indicators; One Way, Return Trip Fare Calculation; Ticket Issuance; PTA, MPD Issuance; Special Fares; Mixed Class; Child and Infant Fares; Encoding, Decoding; Timetable Entries; Flight Display: Sale on flight display; Waiting List; ARNK Segment; Name, Phone Number, Ticketing and Booking Entries; OSI, SSR Entries; Dividing Reservation File; Fare Display: Fare quote; Miscellaneous Entries; Document Production.

**SHU 232 Air Cargo 3+0 4,0**

Basic Concepts; Air Cargo and Its Importance: Cargo organizations and regulations; World Air Cargo Market and Trends; Global Trade and Air Cargo Industry; Logistics and Cargo Interaction; Cargo Types; Cargo Handling Procedures: Reservation and rules, Cargo acceptance and checking procedures; Liabilities of Sender, Cargo Agent and Shipper; Aircraft Types and Ground Support Equipment; Unit Load Devices; Loading Tables; Aircraft Loading Procedures; Special Cargo: Dangerous goods, Live animals, perishables etc. Description, Acceptance, Packing, Labeling, Marking and Handling Procedures of Special Cargo; Air Waybill Completion; Cargo Automation.

**SHU 234 Flight Planning and Monitoring 3+0 4,0**

Flight Planning for VFR Flights; Flight Planning for IFR Flights; Fuel Planning-(Pre-flight fuel planning for commercial flights); Fuel Planning-(Specific fuel calculation procedures); Fuel Planning-(Point of Equal Time (PET) and Point of Safe Return (PSR)); Pre-Flight Preparation-(NOTAM briefing); Pre Flight Preparation- (Metrological briefing ); ICAO Flight Plan (ATS Flight Plan); Flight Monitoring; In-Flight Re-Planning.

**SHU 236 Flight Performance 2+0 3,0**

Basic Definitions: Performance, Performance parameters, Mission profiles; Rules and Related Documents; Load Factors and Design Speeds; Maximum Design Weights; Weight and Range Diagrams; Take-off Limitations; Navigation Limitations; Extended Twin Engine Operations (ETOPS); Landing Limitations, Weight and Balance; Aircraft Performance Categories; General Flight Equations; Take-off, Climb, Cruise, Descent, Holding, Landing; Operation Procedures; Fuel Calculation; Flight Preparation; Flight Management; Flight Tolerances; Flight

**SHU 238 Aviation Security 2+0 4,0**

History of International Aviation Security; Analysis of Illegal Events in Civil Aviation; Importance of Aviation Security; Terminology Related to Aviation Security; Regulations on Aviation Security: National and international regulations; Security Areas: General airport security, Aircraft security; Important Factors in Aviation Security: Physical factors and human factors; Aircraft Security: Management of unruly passengers.

**SHU 240 Passenger Handling Services I 4+0 4,0**

General Aviation Information; Aviation Alphabet; Civil Aviation Organizations: Third-party associations at the airport and service relations, Interdepartmental communications; Aviation Terminology; Airline Responsibilities; Passenger Responsibilities; Airport Aircraft Movement Areas, IATA geography, Flight analysis; Passenger Ticket/Ticket Types, Travel document check, Check-in; Luggage Acceptance; Passengers Requiring Special Services, Transfer and operation of disabled passengers; Boarding, Arrival; Irregularities; Lost & Found; SITA, ATFN; Types of Messages, VHF and radio communication principles.

**SHU 242 Operation and Performance I 4+0 4,0**

Aircraft Masses Related to Load and Balance; Importance of Balance: Center of gravity and balance, Moment, Imaginary start lane, Center of gravity, Center of gravity of an empty aircraft; Main Aerodynamic Wing Section; Load and Balance Calculation Methods; Effects of Overloading on Aircraft Performance; Effect of Load on Back and Front Limit of Center of Gravity on Aircraft Performance; Passenger and Freight Transportation in Air Transportation: Mail, Passenger, Baggage, Cargo regulations and limitations; Load Restrictions, Aircraft limitations; Preparation of Load and Equilibrium Form: Boeing 737, Airbus 320 examples.

**SHU 244 Ground Handling I 4+0 3,0**

Permit Transactions: Definition of permit and legislation information; Scheduled and Scheduled Flights; Third Party Financial Liability Insurance and Aircraft Financial Liability Insurance; Scheduled and Non-Scheduled Flight Application Procedures; Tourist Flights Cargo Charter; Ground Slot Follow-up, Communication; Representative Service Operations; Passenger Services Training; Flight Operation/Ground Slot/Permission Transactions; Lost Baggage/Worldtracer Management; Travel Documents Training; Aircraft Ground Handling Services Training; Communication, Load Control and Balance Training.

**SHU 246 Dangerous Goods 4+0 4,0**

General Philosophy; Limitations; General Requirements for Shipper; Classification, List of dangerous goods; General Packaging Requirements; Packaging Instructions, Marking and labeling; Shipper Declaration and Related Documents; Acceptance Processes, Identification of undeclared dangerous goods; Storage and Loading Procedures, Pilot information; Provisions for Passenger and Crew; Emergency Procedures; Information on Category 1, 2, 3, 4, 5 and 6; Information on Category 7, 8, 9, 10, 11 and 12.

**SHU 301 Production Management in Service Companies 3+0 4,5**

Introduction to Operation/Production Management; Service Structures: Service Industry in Global Economy, Service types, Design and development of goods and services; Capacity Planning; Inventory Management: Material requirements planning, Inventory control; Production Process Design and Development; Quality Management; Airline Operations Management: Demand Forecasting,

Network Models, Flight and crew scheduling, Revenue management and analysis; Airport Operations Management: Airport resource management, baggage management; Passenger flows and waitings.

**SHU 302 Airline Management 3+0 4,5**

Air Transportation Systems; Airlines and Their Product: Airlines, Air transportation markets, Supply and demand; Cost Structure of Airlines; Airline Management and Organization; Functional Departments of Airlines; Air Transportation Operations of Airlines; Network Structure of Airlines: Line, Grid and Hub&Spoke Networks; Global Airline Concept; Airline Alliances; Evaluation of Airline Industry; New Management Approaches at Airlines; Airlines and E-Commerce; Air Cargo Transportation.

**SHU 304 Air Traffic Rules and Services 3+0 4,5**

Definitions; Abbreviations; Applicability of Air Rules; Explanation of Air Rules in Terms of Countries; Adaptation of Air Rules; Responsibility for Adaptation of Air Rules; Collision Avoidance; Nearness; Interception; Landing; Lights Used by Airplane; Flight Plan; Appropriateness of Flight Plan; Contents of Flight Plan; Filling Flight Plan Signalization; Rules of VFR; Rules of IFR; Minimum Flight Level; Cancellation of IFR Plan for VFR Flight; Interception of Civil Aircraft and Escort; Illegal Interference.

**SHU 308 Aviation Ethics 2+0 3,0**

Concept of Ethics; Theory of Ethics: Teleological and Deontological Theories of Ethics, Ethics in Aviation Business; History of Ethics; Components of Ethics: Culture, Social Responsibility; Reasons of Non-Ethical Behaviour: Individual and Organizational Reasons; Ethics in Decision Making Processes; Effects of Non-Ethical Behaviours on Aviation Operations; Case Study in Aviation Industry from Ethical Point of View.

**SHU 341 Passenger Handling Services II 4+0 4,0**

Filling out the Property Irregularity Report (PIR) Form; AHL (Advice if Hold); Reroute; Courtesy AHL Reports and Applications; Lost Baggage; World Tracer Management; Travel Documents Training; Operation and Transfer of Disabled Passengers; Ramp Safety and Apron Rules; Airplane and Passenger Service Equipments and Operations, FOD, De-icing and application procedures; Dangerous Goods Consciousness (Category 9).

**SHU 343 Operation and Performance II 4+0 5,0**

General Aviation Information and Information About Legislation; Load and Special Load Code and Definitions, Special loads; Documentation (Loading Form and Other Forms); Message Types, Communication; Push Back & Head Set; Equipment Used; Introduction and Classification of Vehicles and Equipment; Loading and Unloading - Inconveniences / Near-Miss Conditions; Site Control in Bulk Loads; Providing On-Site Inspection and Safety of Pallets and Containers; Load Planning and Loading; Load & Trim Sheet Preparation.

**SHU 345 Ground Handling II 4+0 2,5**

Operation for Cargo; International Organizations; Aircraft Categories, and Structure and Departments of the Plane, Loading types; Dangerous Materials, Live animals, Deteriorated cargos; Other Special Cargos Consignment Note; Ramp Safety and Apron Rules; Dangerous Goods Awareness; Slot and Permission Training; Meteorology Training; Flight Plan Operations; Communication; Hygiene and Sanitation General Information Training; Catering Handling; Ramp Safety and Apron Rules; Operation Management.

**SHU 403 Finance in Aviation Companies 3+0 4,5**

Importance of Finance in Aviation Companies; Financial Structure of Airlines; Financial Needs and Financial Planning in Air Transportation: Fleet and Network Effect on Financial Needs; Financial Sources for Airlines; Special Financial Problems in Air Transportation; Financial Problems of Airlines in Turkey; Financial Structure of Airports and Financial Needs; Airport Financial Sources and Financing Methods; Financial Implementations of Other Aviation Companies.

**SHU 404 Airport Management 3+0 4,5**

Patterns of Airport Ownership and Management; Airport Privatization; Airport Infrastructure Problems; Economic Characteristics and Financial Structures of Airports; Airport Revenue and Cost Structure; Aeronautical Charges and Pricing Policies; Alternative pricing strategies; Relationship Between Airport Design and Revenue: Developing airport commercial strategies; Measuring Airport Performance; Present Situation and the Future of Airports in Management Perspective in Türkiye.

**SHU 405 Aviation Safety 3+0 4,5**

Aviation Safety Concept; Factors Affecting Aviation Safety; Human Factors in Aviation Safety: Human performance, physiological and psychological factors, Risks, Knowledge, skills and experience, Team work; Passenger Safety; Crew Resource Management; Human Factors in Aviation Maintenance; Human Factors in Air Traffic Control; Human Factors in Airport Activities; Improving Safety Culture of Aviation Organizations; Accident Investigation; Flight Safety and Security.

**SHU 409 Enterprise Resource Management 3+0 4,5**

General System Theory; Enterprises as a System and Fundamental Information Systems; System Design and Analysis: System modeling, Structuring the system infrastructure, Data flows, Databases and relations, data and process modeling; Information systems applications: Enterprise resource planning, Knowledge management, Customer relationship management, Supply chain management, Evaluation of performance, Quality management systems; Case and group studies.

**SHU 412 Airline Fleet Planning 2+0 3,0**

Fleet Concept and Fleet Planning in Airlines: Airlines mission, strategies, and their relationship with fleet planning, Relationship between marketing and fleet planning,

Economic and environmental effects of fleet planning, Flexibility of fleet planning; Organization of Fleet Planning; Types of Aircraft characteristics, comparison of aircraft in terms of performance, operation, technology, ergonomics and point of view marketing, Evaluation for airport characteristics, flight rules and networks; Operational Cost Analysis for Fleet Planning: Aircraft acquisition and leasing costs, Maintenance costs, Ground handling costs, Landing and navigation costs, Fuel costs, Flight crew costs, Other constraints relevant of costs.

**SHU 416 Aircraft Maintenance Management 2+0 3,0**  
 Fundamentals of Aircraft Maintenance; Technical Regulations on Aircraft Maintenance; Types and Levels of Aircraft Maintenance; Tasks and Activities; Aircraft Maintenance Concepts and Primary Maintenance Process; Development of Initial Maintenance Program; Analyzing the Aircraft Maintenance Department in a Typical Airline; Major Processes in an Aircraft Maintenance Department; Documentation of Aircraft Maintenance; Outsourcing of Aircraft Maintenance Activities; Aircraft Maintenance on Financial and Operational Leasing; Aircraft Maintenance Costs.

**SHU 424 Aircraft Maintenance and Reliability Management 3+0 3,0**  
 Fundamentals of Aircraft Maintenance; System Approach and Aircraft Maintenance Activities; Concept of Reliability and Aircraft Maintenance; Types and Levels of Aircraft Maintenance; Aircraft Maintenance Tasks and Activities; Aircraft Maintenance Regulations and Maintenance Methods; Reliability Centered Maintenance; Maintenance Guides; Development of Maintenance Program; Development of Customized Aircraft Maintenance Program; Aircraft Maintenance Planning; Aircraft Reliability Program; Aircraft Maintenance Costs; Human Factors on Aircraft Maintenance.

**SHU 426 Transportation Policies 2+0 3,5**  
 Definition and Importance of Transportation; Transportation Industry; Transportation Policy and Inter-systems Coordination; Transportation Modes; Intermodal Transportation; Changes Affecting Transportation Industry; European Union Transportation Strategies and Policies; Analysis of Turkey's Transportation Policies; Air Transportation Industry Analysis; Impacts of Changes on Air Transportation Industry; Strategic Management in Air Transportation Industry; Analysis of internal and external environment; Investment strategies and planning; Strategic management case studies.

**SHU 428 Logistics Management 2+0 3,0**  
 The Concept of Logistic; Development of Logistic Management; Logistic and Services; Consumer Services; Supply Chains; Production/Service Activity Process; Integration of Logistic Activities; Integrated Logistic; Global Logistic; Elements of Logistic; Network Design; Information Systems; Transportation; Stock Procedures; Package and Distribution; Tools and Supplies; Logistic Sources; Logistic Management Applications; Organization;

Planning; Costs; Pricing; Performance Measurement and Reporting; Examples; Applications of Logistic Management in Airlines.

**SHU 430 Project Management 2+0 3,5**  
 Introduction to Project Management; Success Factors in Project Management; Organizational Structure and Process in Project Management; Project Integration Management; Project Selection Methods: Mathematical methods, Linear programming, Non-Linear programming; Project Content Management: Work breakdown structure, Project management plans, Project monitoring and control; Project Time Management: Activity definition, Activity ordering, Estimation of activity duration, GANNT Diagrams, Critical Path, PERT; Project Cost Management: Cost control techniques; Project Risk Management: Quantitative risk analysis techniques, Qualitative risk analysis techniques; Project Quality Management; MS Project Applications.

**SHU 432 Innovation Management 2+0 3,5**  
 Introduction to Innovation Management; Innovation Management: Key Concepts; Sources of Innovation; Models of Innovation; Standards and Design; Market Entry Timing of Innovative Products and Services; Definition of Organization's Strategic Direction; Selection of Innovation Projects; Collaboration Strategies for Innovation; Protecting Innovation; Management of New Product Development Process; Management of New Product Development Teams; Innovation Examples in Aviation Industry.

**SHU 434 Planning and Scheduling of Airline Operations 2+0 3,0**  
 Planning Optimization: Networks, Network flow models; Flight Scheduling: Hub-and-spoke, Route development and flight-scheduling process, Load factor and frequency; Fleet Assignment: Indicator definitions, Mathematical model; Aircraft Routing: Maintenance requirements, Mathematical model; Crew Scheduling: Crew pairing, Crew pairing mathematical model, Crew rostering, Crew rostering mathematical model; Airline Manpower Planning: Mathematical model; Airline Irregular Operations: Mathematical model; Fuel Management System; Airport Gate Assignment: Mathematical model; Aircraft Boarding Strategy; Runway Capacity Planning.

**SHU 498 Applications of Civil Aviation Management 0+6 6,0**  
 Research Techniques: Basic research and applied research, Data collection techniques, Data processing; Research Methods: Subject selection, Subject restriction, Reference collection; Detailed Research on a Subject in Civil Aviation Management: Definition of the problem or the subject in details, Definition of solution techniques or analysis methods, Researching and performing practical works, Results; Reporting: Page set up, Sentence structure, Headings, Abbreviation formats, Figure and table formats, Table of references format.

**SNT 155 History of Art 2+0 2,0**

History of Civilization and Evolution of Art: Prehistory to Present; Concepts and Terminology in Art with Samples; Interrelation among Art-Religion and Society; Effects of Religion on Artistic Development; Reflections and Interpretations of Judaism, Christianity and Islam on Art; Renaissance: Emergence, Effects, Artists, Works of Art; Architecture and Plastic Arts; Art in the 19th and 20th Centuries: Relevance of the main historical events of the period.

**SOS 107 Behavioral Sciences 2+0 3,0**

Introduction to Sociology and the Sociological Method; The Emergence of Science of Sociology and Sociological Theories; Society and Social Structure; Culture; Socialization; Social Groups; The Family; Social Stratification and Social Change; Introduction to Psychology; Psychology of Lifelong Development; Motives and Emotions; Sensation and Perception; Learning; Psychology of Personality and Personality Theories; Social Effects on Behavior; Attitudes.

**SOS 155 Folkdance 2+0 2,0**

Dance in Primitive Cultures; Dance in Earlier Civilizations; Dance in the Middle Age and Renaissance; Dance in the 18th and 19th Centuries; Dances of the 20th Century; Ballet; Turkish Dances; Emergence of Folkdance; Anatolian Folkdance: Classification, Accompanying instruments; Methods and Techniques of Collecting Folkdance; Problems in Collecting Folkdance; Teaching of Folkdance; Adapting Folkdance for Stage: Stage, Stage aesthetics and Choreography, Orientation and choreography.

**SOS 312 Organizational Behavior 3+0 4,5**

Fundamentals of Organizational Behavior; Historical Perspective; Research Techniques; Individual Organizations and Personality; Attitudes and Job Satisfaction; Personal Differences: Biographical characteristics, Abilities, Learning; Organizational Culture; Social Groups and Group Dynamics in Organizations; Participative Management; Motivation Process and Theories of Motivation; Leadership and Leadership Theories in Organizations; Conflict in Organizations; Stress and Stress Management; Organization, Environment and Technology; Organizational Change; Organizational Development; Team Work in Organizations; Power and Politics.

**TAR 165 Atatürk's Principles and History of Turkish Revolution I 2+0 2,0**

Reform efforts of Ottoman State, General glance to the stagnation period, Reform searching in Turkey, Tanzimat Ferman and its bringing, The Era of Constitutional Monarchy in Turkey, Policy making during the era of first Constitutional Monarchy, Europe and Turkey, 1838-1914, Europe from imperialism to World War I, Turkey from Mudros to Lausanne, Carrying out of Eastern Question, Turkish Grand National Assembly and Political construction 1920-1923, Economic developments from Ottomans to Republic, The Proclamation of New Turkish State, from Lausanne to Republic.

**TAR 166 Atatürk's Principles and History of Turkish Revolution II 2+0 2,0**

The Restructuring Period; The Emergence of the fundamental policies in the Republic of Turkey (1923-1938 Period); Atatürk's Principles, and Studies on Language, History and Culture in the period of Atatürk; Turkish Foreign Policy and Application Principles in the period of Atatürk; Economic Developments from 1938 to 2002; 1938-2002 Period in Turkish Foreign Policy; Turkey after Atatürk's period; Social, Cultural and Artistic Changes and Developments from 1938 to Present.

**TER 203 Thermodynamics 4+0 4,0**

Temperature: Thermometers and temperature scales, Celsius, Fahrenheit, Kelvin; Definition of Heat; Heat Capacity: Specific heat; Heat Transfer: Convection, Radiation, Conduction; Volumetric Expansion; First and Second Law of Thermodynamics; Gases: Ideal gas laws, Specific heat at constant volume and constant pressure, Expanding gas; Isothermal and Adiabatic Expansion and Compression; Entropy: Clausius inequality, Law of entropy increase; Engine Cycles: Constant volume and constant pressure refrigerators and heat pumps; Second Law Analysis in Engineering: Energy, Reversible work and irreversibility; Gas Power Cycles: Carnot cycle and its importance in engineering, Brayton cycle; Latent Heats of Fusion and Evaporation; Thermal Energy; Heat of Combustion.

**THU 203 Community Services 0+2 3,0**

Various Community Projects: Helping young students during their study periods or after school study sessions, Aiding the elderly in nursing homes, helping disabled individuals with various tasks, helping social services and aiding children with their education etc., take part in the projects which raise environmental awareness, Integrating with the community and enabling use of knowledge accumulated in the courses.

**TKY 304 Quality Assurance Systems 2+0 3,0**

General: Description of quality, Quality control; Requirements of Quality Assurance System; Role of Quality Assurance System in Total Quality Management: Description of total quality management; Quality Standards; Detailed Understanding Of ISO 9000 Series; Quality Standards in Aircraft Maintenance; JAR-145: General, Maintenance records, Maintenance organization exposition, Maintenance procedures and quality system, Audits, Facility requirements, Approval and extent of approval.

**TKY 304 Quality Assurance Systems 2+0 3,0**

General: Description of quality, Quality control; Requirements of Quality Assurance System; Role of Quality Assurance System in Total Quality Management: Description of total quality management; Quality Standards; Detailed Understanding Of ISO 9000 Series; Quality Standards in Aircraft Maintenance; JAR-145: General, Maintenance records, Maintenance organization exposition, Maintenance procedures and quality system, Audits, Facility requirements, Approval and extent of approval.

**TRS 211 Technical Drawing and Standards 2+2 4,0**

Introduction: Basics, Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL, Program interface (Creo Parametric); 2D Design: Creating geometries, Using 2D tools, Datum features; 3D Design: Extrude, Revolve, Rib, Sweep, Blend, Hole commands, Rounding corners, Chamfer, Creating object groups, Copying and mirroring objects, Creating patterns, Measuring and inspecting models; Assembly: Assembling with constraints, Assembling with connections, Exploding assemblies; Mechanism Design: Creating mechanism connections, Configuring motion, Mechanism analysis; Drawing: Creating layout, Views, Annotations and tolerances, Wiring and schematic diagrams.

**TÜR 120 Turkish Sign Language 3+0 3,0**

Overview of Sign Language: Characteristics of sign language; History of Sign Language in the World: Emergence of language and sign language, Verbal education and approaches to sign language; History of Turkish Sign Language: Early period, Ottoman period, Period of the Republic of Turkey; Introduction to Turkish Sign Language: Finger alphabet, Pronouns, Introducing oneself and family, Greetings, Meeting, Relationship words; Showing Basic Words: Adjectives: Adjectives of quality, Adjectives of quantity; Verbs: Present tense, Past tense, Future tense, Time adverbs, Antonyms; Healthy Living: Expression of health-related problems, Sports terms, Expressing requirements; In a Bank: Expressions required to carry out basic procedures in a bank; Vacation: Basic words about vacation.

**TÜR 125 Turkish Language I 2+0 2,0**

Language: Characteristics of language, Relationship between language and thought and language and emotion, Theories about the origin of languages, Language types, The position of Turkish Language among world languages; Relationship Between Language and Culture; Historical Progress of the Turkish Language; Alphabets Used for Writing in Turkish; Turkish Language Studies; Turkish Language Reform; Phonetics; Morphology and Syntax; The Interaction of Turkish Language with Other Languages; Wealth of Turkish Language; Problems Facing Turkish Language; Derivation of Terms and Words; Disorders of Oral and Written Expression.

**TÜR 126 Turkish Language II 2+0 2,0**

Composition: Written composition, Paragraph and ways of expression in paragraphs; Punctuation; Spelling Rules; Types of Written Expression and Practices I: Expository writing; Types of Written Expression and Practices II: Narrative writing; Academic Writing and Types of Correspondence; Reading and Listening: Reading, Reading comprehension strategies, Critical reading; Listening; Relationship between Listening and Reading; Oral Expression: Basic principles of effective speech; Body Language and the Role of Body Language in Oral Expression; Speech Types; Principles and Techniques of Effective Presentation; Some Articulatory Features of Oral Expression.

**UGB 103 Theory of Flight 4+0 4,5**

Aeroplane Aerodynamics: Aerostatics, Aerodynamics, Wing section, Boundary layer control, Stall; Flight Control Surfaces: Aileron, Spoiler, Elevator, Stabilator, Variable incidence stabiliser, Canard, Elevon, Taileron; Rudder, Rudder limiters, Ruddervator, Tabs, Control surface bias, High lift devices (flaps, slots, slats, flaperons), Airbrakes, Ground spoiler, Aerodynamic and mass balance; High Speed Flight: Speed of sound, Subsonic, transonic, supersonic flight, Shock waves, Mach number, Critical Mach number, Sweep angle, Buffet, Aerodynamic heating, Area rule, Supersonic engine inlets.

**UGB 202 Electronic Fundamentals I 2+1 3,5**

Diodes: Diode symbols, characteristics and properties, Diodes in series and parallel, Main characteristics and use of silicon controlled rectifiers (thyristors), Light emitting diode, Photo conductive diode, Varactor (varicap), Rectifier diodes; Functional Testing of Diodes; Transistors: Transistor symbols, Component description and orientation, Transistor characteristics and properties; Integrated Circuits: Printed Circuit Boards: Description and use of printed circuit boards; Servomechanisms: Open and closed loop systems, Feedback, Follow up, Analogue transducers; Operation Principles and Use of Synchro System Components/Features: Resolvers, Differential, Control and torque transformers, Inductance and capacitance transmitters.

**UGB 307 Electronic Fundamentals II 2+1 4,5**

Numbering Systems: Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa; Data Conversion: Analogue data, Digital data, Operation and use of analogue to digital, and digital to analogue converters; Data Buses; Logic Circuits: Identification of common logic gate symbols, tables and equivalent circuits, Their use in schematic diagrams of aircraft systems, Interpretation of logic diagrams; Basic Computer Structure: Computer terminology, Computer technology used in aircraft systems; Fibre Optics: Fibre optic data bus, Fibre optic related terms, Terminations, Couplers, Control and remote terminals, Use of fibre optics in aircraft systems.

**UGB 315 Gas Turbine Engine Theory 3+0 4,5**

Potential and Kinetic Energy; Newton's Laws of Motion, Brayton Cycle; Definition of Force, Work, Power, Energy, Velocity, Acceleration; Turbojet, Turbofan, Turboshift, Turboprop; Convergent, Divergent and Variable Area Exhausts Nozzles; Thrust Reverser and Noise Reduction; Turboprop Engine: Reduction gears, Free turbine, Gas-coupled propeller, Propeller control, Overspeed drivers; Turboshift: Arrangements, Drive systems, Reduction gearing, Couplings, Control systems.

**UGB 317 Aircraft Hardware and Applications I 3+5 6,0**

Safety Precautions-Aircraft and Hangar; Maintenance Practices: Maintenance of tools, Dimensions, Tolerances, Calibration of tools; Tools: Types, Precision measuring tools, Lubrication equipment; Fits and Clearances: Limits for bow, Twist and wear, Shaft and bearings checking standards;



Riveting: Riveted joints; Pipes and Hoses: Installation, Inspection and testing of aircraft pipes and hoses; Material Handling: Sheet metal, Composite and non-metallic; Fasteners: Screw threads, Bolts, Studs and screws, Locking devices; Pipes and Unions: Types of rigid and flexible pipes; ATA (Air Transport Association) Definitions of Aircraft Group, System and sub-system.

### **UGB 320 Aircraft Hardware and Applications**

#### **II**

**3+3 4,5**

Springs: Types of springs, Materials, Characteristics and applications, Inspection and testing of springs; Bearings: Purpose of bearings, Loads, Types, Material, Construction, Testing, cleaning and inspection of bearings, Lubrication requirements, Defects in bearings; Transmissions: Gear types and their application, Gear ratios, Driven and driving gears, Belts and pulleys, Chains, Inspection; Control Cables: Types of cables, Pulleys and cable system components, Bowden cables, Inspection, Aircraft flexible control systems.

### **UGB 322 Gas Turbine Engine Systems I**

**4+0 4,5**

Fundamentals; Engine Performance; Inlet; Compressors; Combustion Section; Turbine Section; Exhaust; Lubrication Systems: Components, Operation principle; Fuel Systems: Components, Operation principle; Air Systems: System lay-out and components; Starting and Ignition Systems: System lay-out and components; Engine Indication Systems: Exhaust gas temperature, Oil pressure and temperature, Fuel flow, Vibration, Engine speed, Engine pressure ratio; Auxiliary Power Units (APUs): Components, Oil, fuel, and starting systems, Stall protection system, Bleed system.

### **UGB 324 Aircraft Structure and Systems I**

**4+1 4,0**

Structures-General Concepts: Stress analysis and loads affecting the aircraft, Safe life, Fail safe, Damage tolerance, Wing structure, Fuselage and empennage, Materials used in aircraft; Hydraulic Power: System lay-out, Hydraulic fluids, Hydraulic reservoirs and accumulators, Pressure generation, Emergency pressure generation, Filters, Indication and warning systems, Interface with other systems; Landing Gear: Construction, Shock absorbing, Extension and retraction systems, Indications and warnings, Wheels, Brakes, Tyres, Steering, Sensing; Equipment and Furnishings: Seats and belts, Equipment lay-out, Airstairs.

### **UGB 326 Avionic Systems**

**4+0 4,0**

Instrument Systems; Pitot static: Altimeter; Air speed indicator, Vertical speed indicator; Gyroscopic: Artificial horizon, Attitude director, Direction indicator, Horizontal situation indicator, Turn and slip indicator, Turn coordinator; Compasses: Direct reading, Remote reading; Angle of Attack Indicators; Stall Warning Systems; Glass Cockpit; Other Aircraft Indication Systems; System Lay-outs and Operation of Avionic Systems: Auto Flight; Communications; Navigation Systems; On Board Maintenance Systems; Central Maintenance Computers; Data Loading System; Electronic Library System; Printing; Structure Monitoring (Damage Tolerance Monitoring).

### **UGB 328 Non-destructive Inspection Methods**

**0+3 2,0**

Non-destructive Inspection Methods: Application steps of liquid penetrant inspection method; Application Steps of Magnetic Particle Inspection Method; Application Steps of Eddy Current Inspection Method; Application Steps of Ultrasonic Inspection Method; Radiographic Inspection and Evaluation of Radiographic X-Ray Films; Visual and Optical Inspection; Boroscope Control and Discontinuities and Defects of Materials.

### **UGB 407 Aircraft Structure and Systems II**

**3+0 4,0**

Air Conditioning and Cabin Pressurisation: Air supply, Air conditioning system, Pressurisation systems; Safety and warning devices; Oxygen System: Flight crew oxygen system, Passenger oxygen system, Portable oxygen system; Pneumatic/Vacuum System: System lay-out, System sources, User system, Component location, Distribution, Indications and warnings; Water/Waste System: Supply, Distribution, Water heaters, Draining system, Indicators, Corrosion.

### **UGB 408 Fracture Mechanics**

**3+0 3,0**

Introduction To Fracture Mechanics; Damage Tolerance And Fracture Mechanics; Linear Elastic Fracture Mechanics; Stress At A Crack Tip; Stress Intensity Factor; Plastic Zone And Stresses In Plane Stress And Plane Strain; Constant Amplitude Crack Growth In A Structure; Load Interaction; Retardation; Crack Growth Analysis For Variable Amplitude Loading; Fracture Control; Crack Control; Determining Inspection Intervals; Fracture Control Plans; The Cost of Fracture And Fracture Control; Damage Tolerance Concept; Aircraft Damage Tolerance Requirement.

### **UGB 409 Maintenance Practices**

**3+5 6,5**

Welding, Brazing, Soldering and Bonding: Welding, brazing and bonding methods and inspection; Aircraft Weight and Balance; Aircraft Handling and Storage: Aircraft taxiing and towing, jacking, chocking, securing, Aircraft storage methods, Refueling/defueling procedures, De-icing/anti-icing procedures, Electrical, hydraulic and pneumatic ground supplies, Effects of environmental conditions on aircraft handling and operation, Disassembly, Inspection, Repair and Assembly Techniques; Maintenance Procedures.

### **UGB 411 Gas Turbine Engine Systems II**

**4+0 5,5**

Exhaust: Thrust reverser systems; Power Augmentation Systems: Operation and applications, Water injection, water methanol, Afterburner systems; Powerplant Installation: Configuration of firewalls, Cowlings, Acoustic panels, Engine mounts, Anti-vibration mounts, Hoses, pipes, feeders, connectors, wiring looms, control cables and rods, Lifting points and drains; Fire Protection Systems: Operation of detection and extinguishing systems; Engine Monitoring and Ground Operation: Procedures for starting and ground run-up, Interpretation of engine power output and parameters.

### **UGB 412 Aircraft Structure and Systems III**

**3+0 3,0**

Fire Protection: Fire and smoke detection and warning systems, Fire extinguishing systems, System tests, Portable

fire extinguisher; Fuel Systems: System lay-out, Fuel tanks, Supply systems, Dumping, Venting and draining, Cross-feed and transfer, Indications and warnings, Refueling and defueling, Longitudinal balance fuel systems; Ice and Rain Protection: Ice formation, Classification and detection, ?Anti-Icing Systems: Electrical, Hot air and chemical, De-Icing Systems: Electrical, Hot air, Pneumatic and chemical, Rain repellent, Probe and drain heating, Wiper systems.

#### **UGB 413 Non-destructive Inspection Methods 3+0 4,5**

Introduction of Non-Destructive Inspection; Role and Importance of Non-destructive Inspection; Benefits of Non-Destructive Inspection Methods in Aircraft Maintenance; Classification of Aircraft Service Life: Defects such as corrosion and fatigue; Surface Cleaning Methods Before Non-destructive Inspection; Radiography Method; Fluoroscopic Inspection; Ultrasonic Inspection; Eddy Current Inspection: Visual inspection as a non-destructive method; Liquid Penetrant Inspection; Use of Non-destructive Inspection Methods in Aircraft Maintenance.

#### **UGB 414 Flight Controls 3+0 3,0**

Overview of Control Systems; Primary Controls: Aileron, Elevator, Rudder, Spoiler; Trim Controls; Pitch Trimming; Versine Signal; Active Load Control; High Lift Devices; Lift Dump and Speed Brakes; Torque Limiting; Artificial Feel and Centering; Flutter Damping; Yaw Damper; Mach Trim; Rudder Limiter; System Operation: Manual; Gust ILcks; Stall Warning and Protection Systems; Balancing and Rigging; Fly by Wire.

#### **UGB 416 Fuel Systems of Gas Turbine Engines in Aircraft 3+0 3,5**

Fundamental Concepts: Definition of flame, Equations of flame; Types of Gas Turbine Engines; Jet Engine Fuels and Properties; Lubricants and Fuels: Properties and specifications, Fuel additives, Safety precautions; Combustion Chambers: Types and properties of combustion chambers; Fuel Injection; Ignition; Fuel Systems in Gas Turbines; Fuel Control Systems: Basic components, Engine control devices, Fuel instrumentation.

#### **UGB 420 Propeller 3+0 4,0**

Fundamentals: Basic propeller aerodynamics, Blade element theory, Angle definitions, Rotational speed, Relative airflow, Propeller slip, Aerodynamic forces, Centrifugal force, Thrust forces, Torque, Vibration and resonance; Propeller Construction: Materials, Blade definitions, Fixed/controllable pitch, Constant speeding propeller, Propeller installation, Propeller pitch/speed control, Pitch change, Feathering, Reverse pitch, Overspeed protection; Synchronising; Ice Protection; Propeller Maintenance: Balancing, Blade tracking, Blade damage, Propeller repair schemes, Propeller engine running; Propeller Storage and Preservation.

#### **UGB 422 Environmental Impact Assessment in Aviation 3+0 4,5**

Environmental Impact Assessment (EIA): General information, Concepts; Environmental Damages: Human

health, Ecosystem quality, Resources; Implementation and Steps of EIA: Life Cycle Assessment (LCA); Environmental Impact Assessment in Aviation: Airlines, Aircrafts, Aviation-related facilities; Application of Environmental Impact Assessment in Aircrafts: Data collection, Calculation, Evaluation of the results.

#### **UGB 424 Reciprocating Engines 1+3 3,0**

Fundamentals; Operating Cycles; Mechanical, Thermal and Volumetric Efficiencies; Piston Displacement and Compression Ratio; Power Calculations; Factors Affecting Performance; Engine Classification; Engine Construction: Crankcase, Crank shaft, Cylinder and piston assemblies, Bearings; Carburetors: Types, Construction and principles of operation; Fuel Injection Systems; Starting and Ignition Systems; Lubricants and Fuels; Lubrication Systems; Supercharger/Turbocharger Systems; Engine Storage And Preservation.

#### **UGB 425 Aircraft Maintenance Practices M11 0+5 4,5**

General aircraft practices: finding of inspection doors and components, replace vacuum and fuel pump, CSD / IDG, pressurization test, Electricity system practices: contactor, role, generator, magnetic compass, interior and exterior lamps, Interior practices: carpet and seats, emergency equipment, Cargo panels, door sealants, Hydraulic system practices: replace of hydraulic and component, shaft inspection, Landing gears and brake system practices: wheels, brake units, sealants, Fire warning and fire extinguishing system practices: control and inspection of engine fire extinguishing system.

#### **UGB 426 Gas Turbine Engine Workshop 0+8 3,5**

Fundamentals; Engine Performance; Inlet; Compressors; Combustion Section; Turbine Section; Exhaust; Lubrication Systems; Fuel Systems; Air Systems; Starting and Ignition Systems; Engine Indication Systems; Auxiliary Power Units (APUs); Power Augmentation Systems: Water injection, Afterburner systems; Powerplant Installation: Configuration of firewalls, Cowlings, Acoustic panels, Engine mounts, Hoses, Pipes, Feeders, Connectors, Wiring looms, Control cables and rods, Lifting points and drains; Fire Protection Systems; Engine Monitoring and Ground Operation: Procedures for starting and ground run-up, Interpretation of engine power output and parameters.

#### **UGB 428 Aircraft Maintenance Practices M7 0+4 4,5**

Aircraft maintenance safety: Chemical agents, Hazardous conditions, Safety precautions; Aircraft inspections: General visual inspections, Detailed visual inspections; Aircraft maintenance Practices: Aircraft part tags, Warning cards, removal of aircraft components, Installation of aircraft components, lubrication, cleaning; Aircraft maintenance documents: Aircraft maintenance manual, Illustrated part catalogue, Scheduled maintenance task cards, unscheduled maintenance cards; Basic maintenance practices: Opening and closing cabin doors, Opening and closing cargo compartment doors, Energize hydraulic system, Energize electrical system.

**UGB 430 Aircraft Maintenance Practices M17 0+4 3,0**

Introduction of propeller: blade, leading edge, pitch and governor; Remove and installation of constant pitch propeller; Remove and installation of variable pitch propeller; Controls of new installed propellers, lubrication of propeller; Governor: remove, installation and controls; Set-up of propeller's speed; De-icing and anti-icing systems; Propeller tracking; Maintenance of propeller; Ground running-up an aircraft with propeller; Static and dynamic balance; Propeller storage.

**UMB 407 Heat Transfer and Aircraft Engine Applications 3+0 3,0**

Introduction to Heat Transfer: Conduction, Convection, Radiation; Steady Heat Conduction: Thermal resistance, Thermal resistance network, Critical radius, Heat conduction in plane walls, cylinders and spheres; Transient Heat Conduction: Lumped system analysis; Forced Convection: Physical mechanism, Thermal boundary layer, General thermal analysis; Natural Convection: Physical mechanism, Natural convection over surfaces; Thermal Radiation: Blackbody, View factor; Gas Turbine Engine Applications: Finned surfaces, Cooling, Heat exchangers

**UMB 452 The Application of Gas Turbine's for Cogeneration 3+0 4,5**

Introduction To Cogeneration; Thermodynamic Principles of Combined Cycle Plants; Important Technical Parameters For Cogeneration: Heat-To- Power Ratio; Quality of Thermal Energy Needed; Load Patterns; Fuels Available; System Reliability; Classification of Cogeneration Systems: Base Electrical Load Matching; Base Thermal Load Matching; Electrical Load Matching; Thermal Load Matching; Technological Advances In Cogeneration: Reciprocating Engine; Gas Turbine; Steam Turbine; Fuel Cells; Application of Cogeneration.