SEMESTER V

Course Code		Credits :4
USARA 501	**AIRFRAME SYSTEMS**	
Unit I - Hydraulic Power and Pneumatic/Vacuum Systems: System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Pressure Control; Power distribution; Indication and warning systems; Interface with other systems. Filters. **Pneumatic/Vacuum Systems:** System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.		**30 Lectures**
Unit II –Ice and rain protection Pneumatic deicing systems, de-icer boots constructions, deicing system components, pneumatic deicing system maintenance, thermal anti icing system, ground deicing of aircraft, wind shield ice control system, rain elimination system		**30 Lectures**
Unit III –Oxygen System : Oxygen system: Purpose of the system; Safety portable & fixed Oxygen systems; low pressure and high pressure oxygen system & components; Installation and replacement of Oxygen lines. General familiarization with provision of emergency equipment on modern aircraft such as Emergency exits; Megaphone; Signaling Flares; FDR & CVR; Fire Extinguishers. **Lights :**External: navigation, anti-collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.		**30 Lectures**
Reference Book :- A & P Technician Airframe textbook (Jeppesen)		

Course Code		Credits :4
USARA 502	**LANDING GEAR**	
Unit I –General – Landing gear arrangement, shock strut, electrical and hydraulic landing gear extension and retraction, emergency extension system, nose wheel centering mechanism, nose wheel steering, shimmy dampers.		**30 Lectures**
Unit II – Brakes – Independent brake system, power operated brake system, power boosted brake system, power brake control valve, nose wheel brakes, single disc brakes, multi disc brakes, segmented rotor brakes, expander tube brake system, inspection and maintenance of brakes, bleeding of brake.		**30 Lectures**

Unit I –General – Landing gear arrangement, shock strut, electrical and hydraulic landing gear extension and retraction, emergency extension system, nose wheel centering mechanism, nose wheel steering, shimmy dampers.	**30 Lectures**
Reference Book :- A & P Technician Airframe textbook (Jeppesen)	

Course Code		Credits :3
USARA 503	**Snag rectification**	
Unit I –AIRCRAFT ELECTRICITY The snags in the aircraft systems pertaining to syllabus covered in Semester 1 to Semester 4 for Aircraft Electrical systems. The snag analysis, reason finding and rectification required.		**30 Lectures**
Unit II –AIRCRAFT INSTRUMENT The snags in the aircraft systems pertaining to syllabus covered in Semester 1 to Semester 4 for Aircraft Instrument systems. The snag analysis, reason finding and rectification required.		**30 Lectures**
Unit III –RADIO NAVIGATION The snags in the aircraft systems pertaining to syllabus covered in Semester 1 to Semester 4 for Aircraft Radio communication systems and aircraft Digital Technology. The snag analysis,reason finding and rectification required.		**30 Lectures**
Reference Books: 1. Aircraft instruments by E.H.J. Pallet, 2. Aircraft electricity by Eismin 3. Aircraft communication and navigation system by MIKE TOOLEY		

Course Code		Credits :4
USARA 504	**CABIN ATMOSPHERE CONTROL**	
Unit I – Fire Protection : Fire extinguishing Principles, fire extinguisher mediums & their proper use, Fire warning devices, Thermal switches, Thermocouple system, continuous loop fire warning systems, spot detection, smoke detection, fire zones, Routine maintenance, inspection.		**30 Lectures**
Unit II – Pressurization Atmosphere; Description of a cabin pressure system; Structural Requirements for pressure cabins; Cabin pressure and rate of change controls; Safety; Discharge and Relief Valves; Recirculation systems; Humidification. Precautions to be observed on ground tests; Understanding the pressure altitudes; cabin altitude; Differential pressure; Operations of pressure controllers; Outflow valve; Safety Valve; Cabin rate of climb indicator; Manual pressure control valve; Negative pressure relief valve; Fault finding.		**30 Lectures**
Unit III –Air Conditioning Air conditioning systems; Air cycle and vapour cycle machines		**30 Lectures**

Distribution systems; Flow, temperature and humidity control system.	

Reference Book :-

1. A & P Technician Airframe Textbook –Jeppesen
2. Aviation Maintenance Techician handbook – FAA -9A, 15A, 12A

PRACTICALS

Course Code	**PRACTICALS**	Credits :1
USARA 5P1	**AIRFRAME SYSTEM**	60 marks
1. Servicing of hydraulic reservoir 2. Operation of Hydraulic shut off valve 3. Charging of hydraulic accumulator 4. Discharging of hydraulic accumulator 5. Check for hydraulic leak 6. Servicing of pneumatic system installed on aircraft 7. Check for anti-icing methods used on aircraft 8. Study how Anti-icing of windshield is done 9. Check for various components and servicing of those components used for anti-icing purpose on the aircraft. 10. Servicing of oxygen cylinder 11. Servicing of oxygen mask 12. Carryout snag analysis and rectification of Hydraulic quantity low 13. Carryout snag analysis and rectification for Low oxygen pressure		**50 hours**

Course Code	**PRACTICALS**	Credits :1
USARA 5P2	**LANDING GEAR**	60 marks
1. Locate and identify various parts of aircraft landing gear 2. Carryout greasing of various parts of aircraft landing gear 3. Swap landing gear wheel on aircraft 4. Servicing of oleo pneumatic shock strut 5. Identify the information given on tire 6. Inspection of brake system 7. check the operation of antiskid system installed on aircraft 8. Replace the tires on the aircraft wheel. 9. Carryout analysis and rectification of Landing Gear warning light ON		**40 hours**

Course Code	**PRACTICALS**	Credits :1
USARA 5P3	**SNAG RECTIFICATION ELECTRICITY**	60 marks
1. Practicals on defect rectification of aircraft power supply system such as GPU not Getting connected to aircraft. Low battery voltage, ground relay chattering etc. 2. Practicals on defect rectification on aircraft power supply distribution system such as voltage regulators malfunctioning, adjustment of voltage on aircraft etc. 3. Practicals on defect rectification on navigation, anti-collision and landing lights etc. 4. Practicals on inverter circuits, primary, secondary and standby inverter		**50 hours**

5. Practicals on removal, inspection and fitting of anti-collision lights. 6. Practicals on servicing of GPU, charging, cleaning, checking of electrolyte level and specific gravity. 7. Checking the serviceability, inspection, removal and fitting of landing lights and taxiing lights etc.	

Course Code	**PRACTICALS**	Credits :1
USARA 5P4	**RADIO NAVIGATION**	60 marks
1) Familiarization of test equipment signal generator, frequency counter 2) Study of radio altimeter and its test procedure 3) Familiarization of ATC system components and its test procedure 4) Study of ADF system components and its test procedure 5) Identification of ILS components and study its test procedure 6) Study of GPWS components and testing 7) Study of W/R system components and its procedure 8) Study of ESDS requirements and precaution during ground handling 9) Operational test of VHF com system on Local frequency contact precaution and procedure 10) Operational test of VOR Nav. system 11) Operational/Self test operation of ILS components		**50 hours**

Course Code	**PRACTICALS**	Credits :1
USARA 5P5	**INSTRUMENT SYSTEM (SNAG RECTIFICATION)**	60 marks
Pitot –static system related snag. Capacitance type Fuel quantity system related snag. Stall warning system related snag. EGT System snags. N1 & N2 rpm related system snags. Fuel flow system related snags. EPR related system snags. Auto pilot system related snags. Engine oil system related snags. DR Compass, RR compasses related snags. Gyro related snags on aircraft.		**50 hours**