UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

(An Association of Heritage Aviation Pvt.Ltd & IRDT Dehradun)

SYLLABUS

Stream: Avionics Category: B2

Semester: I

Subject: Electrical Fundamentals Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.1.3.1	3.1 Electron Theory Structure and distribution of electrical charges within: atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors and insulators.	1	2
4.2.1.3.2	3.2 Static Electricity and Conduction Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases and a vacuum.	2	2
4.2.1.3.3	3.3 Electrical Terminology The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	2	2
4.2.1.3.4	3.4 Generation of Electricity Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.	1	2
4.2.1.3.5	3.5 DC Sources of Electricity Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells; Cells connected in series and parallel; Internal resistance and its effect on a battery; Construction, materials and operation of thermocouples; Operation of photo-cells.	2	8
4.2.1.3.6	3.6 DC Circuits Ohms Law, Kirchoff's Voltage and Current Laws; Calculations using the above laws to find resistance, voltage and current;	2	4

	Significance of the internal resistance of a supply.		
4.2.1.3.7	3.7 Resistance/Resistor (A)Resistance and affecting factors; Specific resistance; Resistor colour code, values and tolerances, preferred values, wattage ratings; Resistors in series and parallel; Calculation of total resistance using series, parallel and series parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge. (B)Positive and negative temperature coefficient conductance; Fixed resistors, stability, tolerance and limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge;	2	6
4.2.1.3.8	3.8 Power Power, work and energy (kinetic and potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work and energy.	2	2
4.2.1.3.9	3.9 Capacitance/Capacitor Operation and function of a capacitor; Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction and function; Capacitor colour coding; Calculations of capacitance and voltage in series and parallel circuits; Exponential charge and discharge of a capacitor, time constants; Testing of capacitors.	2	4
4.2.1.3.10	3.10 Magnetism (A)Theory of magnetism; Properties of a magnet	2	4

	Action of a magnet suspended in the Earth's magnetic field; Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction and principles of operation; Hand clasp rules to determine: magnetic field around current carrying conductor. (B)Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.		
4.2.1.3.11	3.11 Inductance/Inductor Faraday's Law; Action of inducing a voltage in a conductor moving in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect the rate of change of primary current and mutual inductance has on induced voltage; Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other; Lenz's Law and polarity determining rules; Back emf, self-induction; Saturation point; Principle uses of inductors;	2	5
4.2.1.3.12	3.12 DC Motor/Generator Theory Basic motor and generator theory; Construction and purpose of components in DC generator; Operation of, and factors affecting output and direction of current flow in DC	2	9

	generators; Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; Series wound, shunt wound and compound motors; Starter Generator construction.		
4.2.1.3.13	3.13 AC Theory Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power Triangular/Square waves; Single/3 phase principles.	2	5
4.2.1.3.14	3.14 Resistive (R), Capacitive (C) and Inductive (L)Circuits Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations.	2	5
4.2.1.3.15	3.15 Transformers Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line and phase voltages and currents; Calculation of power in a three phase system; Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers.	2	5
4.2.1.3.16	3.16 Filters Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.	1	2
4.2.1.3.17	3.17 AC Generators Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type	2	5

	AC generators; Single phase, two phase and three phase alternators; Three phase star and delta connections advantages and uses; Permanent Magnet Generators.		
4.2.1.3.18	3.18 AC Motors Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole	2	8
Total Hours			80

Subject: Aviation Legislation Part A Theory

Syllabus Ref No.		Level	Hours Allotted
4.2.1.10.1	10.1 Regulatory Framework Role of International Civil Aviation Organisation; The Aircraft Act and Rules made there under Role of the DGCA; Relationship between CAR-21, CAR-M, CAR-145, CAR-66, CAR 147 The Aircraft Rules (Applicable to Aircraft Maintenance and Release) Aeronautical Information Circulars (Applicable to Aircraft Maintenance and Release) CAR Sections 1 and 2	1	40
4.2.1.10.2	10.2 CAR-66 Certifying Staff – Maintenance Detailed understanding of CAR-66	2	20
4.2.1.10.4	10.4 Aircraft Operations Commercial Air Transport/Commercial Operations Air Operators Certificates; Operators Responsibilities, in particular regarding continuing airworthiness and maintenance; Documents to be carried on board; Aircraft Placarding (Markings);	1	10
4.2.1.10.7	10.7 Applicable National and International Requirements (a)Maintenance Programme, Maintenance checks and inspections; Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists;	2	25

	Airworthiness Directives; Service Bulletins, manufacturers service information; Modifications and repairs; Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.; (b)Continuing airworthiness; Test flights; ETOPS /EDTO, maintenance and dispatch requirements; RVSM, maintenance and dispatch requirements RNP, MNPS Operations All Weather Operations, Category 2/3 operations and minimum equipment requirements		
Total Hours			90

Subject: Maintenance Practices Part A Theory

Syllabus Ref No.	Topics	Level	Hours Allotted
4.2.1.7.1	7.1 Safety Precautions-Aircraft and Workshop Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents	3	5
4.2.1.7.2	7.2 Workshop Practices Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, standards of workmanship; Calibration of tools and equipment, calibration standards.	3	5
4.2.1.7.3	7.3 Tools Common hand tool types; Common power tool types; Operation and use of precision measuring tools; Lubrication equipment and methods. Operation, function and use of electrical general test equipment;	3	40
4.2.1.7.4	7.4 Avionic General Test Equipment Operation, function and use of avionic general test equipment	2	5

4.2.1.7.5	7.5 Engineering Drawings, Diagrams and Standards Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identifying title block information Microfilm, microfiche and computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.	2	10
4.2.1.7.6	7.6 Fits and Clearances Drill sizes for bolt holes, classes of fits; Common system of fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings and other parts	2	5
4.2.1.7.7	7.7 Electrical Wiring Interconnection System (EWIS) Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance. Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding. EWIS installations, inspection, repair, maintenance and cleanliness standards.	3	5
4.2.1.7.15	7.15 Welding, Brazing, Soldering and Bonding (A)Soldering methods; inspection of soldered joints. (B)Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	2	5
	Total Hours		**80**

Subject: Basic Aerodynamics Theory

Syllabus Ref No.	Topics	Level	Hours Allotted
4.2.1.8.1	8.1 Physics of the Atmosphere International Standard Atmosphere (ISA), application to aerodynamics	2	5
4.2.1.8.2	8.2 Aerodynamics Airflow around a body;	2	25

	Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre 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; Aerofoil contamination including ice, snow, frost		
4.2.1.8.3	8.3 Theory of Flight Relationship between lift, weight, thrust and drag; Glide ratio; Steady state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope and structural limitations; Lift augmentation.	2	15
4.2.1.8.4	8.4 Flight Stability and Dynamics Longitudinal, lateral and directional stability (active and passive).	2	15
	Total Hours		60

UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

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Subject: Maintenance Practices Part A Practical

Sr no.	ATA Chap.	CAR66 Ref	Task No.	Basic Practical Tasks	Performed on	Level	Hours Allotted
	--	7.1	7A-01	Perform the mock drill for operation of Fire Extinguisher. Perform The Mock Drill for First AID in the event of Electrical Shock.	Lab	3	2
	--	7.2	7A-02	Perform care procedure of hand tools a. Care of Hammers. b. Care of Screwdrivers. c. Care of Wrenches. d. Care of Pliers and Tongs. e. Care of Chisels. f. Care of Punches. g. Care of Files. h. Care of Taps. i. Care of Dies. j. Care of Dividers & Callipers. k. Care of Micrometres. l. Care of Rules. m. Care of Scriber.	Tool Crib	3	1

--	7.3	7A-03	To make a square fit from the given mid steel pieces	Gen Engg. W/S	3	2
--	7.3	7A-04	Use the plan and Philips screw drivers, Bitsin combination of bit holders and ratchet, extension bar to open and tight the panel mounted screws.	Gen Engg. W/S	3	1
--	7.3	7A-05	Open and tight the panel mounted screwsby using speed handle, bits and holder.	Gen Engg. W/S	3	1
--	7.3	7A-06	Open the panel mounted screw by using power operated screw drivers.	Gen Engg. W/S	3	1
--	7.3	7A-07	Install and remove the nut and bolts assembly by using the combination spanners & adjustable spanners.	Gen Engg. W/S	3	1
--	7.3	7A-08	Install and remove the nut and bolts assembly by using sockets, extension, ratchet, T handle, universal joint, expanders& reducers.	Gen Engg. W/S	3	1
--	7.3	7A-09	Install and remove the nut and bolts assembly by using offset and offset socket wrenches.	Gen Engg. W/S	3	1
--	7.3	7A-10	Remove and installed the set head screw or socket head screws.	Gen Engg. W/S	3	1
--	7.3	7A-11	Grip the job at C clamp, tool maker clampand grip vies pliers and remove the damaged exposed screw by using grip vise pliers.	Gen Engg. W/S	3	1
--	7.3	7A-12	Perform the wire locking by using locking wire pliers	Gen Engg. W/S	3	1
--	7.3	7A-13	Set and use the given torque value oftorque in different units in torque wrenches.	Gen Engg. W/S	3	1
--	7.3	7A-14	Use the screw extractor to remove thedamage screw	Gen Engg. W/S	3	1
--	7.3	7A-15	Remove and install the stud from assemblypart.	Gen Engg. W/S	3	1

--	7.3	7A-16	Use the crowfoot wrench and hook spanners to remove and installed nut and bolt from the assembly part.	Gen Engg. W/S	3	1
--	7.3	7A-17	Remove and installed the circlip by usingthe circlip pliers.	Gen Engg. W/S	3	1
--	7.3	7A-18	Use the impact drivers to break loose a stubborn fastener.	Gen Engg. W/S	3	1
--	7.3	7A-19	Perform the measurements by using thesteel rule (metric and Inches).	Gen Engg. W/S	3	1
--	7.3	7A-20	Perform the measurements by using the outside micrometer (imperial and metric).	Gen Engg. W/S	3	1
--	7.3	7A-21	Perform the measurements by using the Vernier callipers (imperial and metric).	Gen Engg. W/S	3	1
--	7.3	7A-22	Perform the measurements by using the Vernier height gauge.	Gen Engg. W/S	3	1
--	7.3	7A-23	Perform the measurements by using the Vernier depth gauge.	Gen Engg. W/S	3	1
--	7.3	7A-24	Perform the measurements by using the Telescoping gauge.	Gen Engg. W/S	3	1
--	7.3	7A-25	Perform the measurements by using thesmall hole gauge.	Gen Engg. W/S	3	1
--	7.3	7A-26	Perform the measurements by using thedial test indicator (imperial and metric).	Gen Engg. W/S	3	1
--	7.3	7A-27	Perform the angle measurements by using the precession bevel protector.	Gen Engg. W/S	3	1
--	7.3	7A-28	Perform measurement by using the combination set.	Gen Engg. W/S	3	1
--	7.3	7A-29	Measure the inside diameter of a job byusing the inside calipers	Gen Engg. W/S	3	1
--	7.3	7A-30	Measure the outside diameter of a job byusing the outside calipers	Gen Engg. W/S	3	1
--	7.3	7A-31	Transfer the measurement from outside to inside calipers	Gen Engg. W/S	3	1
--	7.3	7A-32	Measure the distance and draw an arc & circle by using the dividers.	Gen Engg. W/S	3	1

--	7.3	7A-33	Draw parallel lines by using the jenny callipers& find the centre of round bars by using jenny callipers.	Gen Engg. W/S	3	1
--	7.3	7A-34	Check the hole of exact size by using Ring gauge.	Gen Engg. W/S	3	1
--	7.3	7A-35	Check the accuracy of holes by using plug gauge	Gen Engg. W/S	3	1
--	7.3	7A-36	Check the size of the drill bits by using thedrill gauge	Gen Engg. W/S	3	1
--	7.3	7A-37	Measure the clearance or gaps by using feeler or thickness gauge	Gen Engg. W/S	3	1
--	7.3	7A-38	Check the inside and outside radius of a component by using a fillet or radius gauge.	Gen Engg. W/S	3	1
--	7.3	7A-39	Check the pitch of a thread by using screwpitch gauge	Gen Engg. W/S	3	1
--	7.3	7A-40	Perform the measurement by use of Goand not go gauge	Gen Engg. W/S	3	1
--	7.3	7A-41	Check the wire size by using the SWG/AWG.	Gen Engg. W/S	3	1
--	7.3	7A-42	Check the flatness of surface by using inclinometer	Gen Engg. W/S	3	1
--	7.6	7A-43	Drill holes as per the given size by using ofpillar and sensitive drill machine.	Gen Engg. W/S	3	1
--	7.6	7A-44	Perform the reaming operation to enlarge the drilled holes to accurate dimensions.	Gen Engg. W/S	3	1
--	7.6	7A-45	Cut the internal screw thread on drilledholes by using the taps.	Gen Engg. W/S	3	1
--	7.6	7A-46	Cut the external screw threads on roundbar metals by using the dies.	Gen Engg. W/S	3	1
--	7.3	7A-47	Perform the grinding operation on aspecimen job	Gen Engg. W/S	3	1
--	7.3	7A-48	Perform the buffing operation on a specimen job	Gen Engg. W/S	3	1
--	7.3	7A-49	Cut the job peace by Powered hacksaw.	Gen Engg. W/S	3	1
--	7.3	7A-50	Cut the metal sheet by using Sheet metal guillotine/hand shear machine.	Gen Engg. W/S	3	1

--	7.3	7A-51	Perform the turning operation for a job onlathe machine.	Gen Engg. W/S	3	1
--	7.6	7A-52	Perform the Counter boring, spot facingand countersinking operation.	Gen Engg. W/S	3	1
--	7.6	7A-53	To cut a spur gear tooth on a given circularblank by gear cutting processes on horizontal milling machine.	Gen Engg. W/S	3	1
--	7.15	7A-54	Perform electric arc welding and make the different joints.	Gen Engg. W/S	3	1
--	7.15	7A-55	Perform TIG welding and make the different joints.	Gen Engg. W/S	3	1
--	7.15	7A-56	Perform the oxy Acetylene welding by using different flame.	Gen Engg. W/S	3	1
--	7.15	7A-57	Perform the spot welding on a job peace.	Gen Engg. W/S	3	1
--	7.7	7A-58	Use multimeter to meters to measure ACand DC volts, amps and resistance.	Electrical Lab	3	1
--	7.7	7A-59	Check an aircraft electrical circuit for continuity in conjunction with an electricalwiring diagram	Electrical Lab	3	1
--	7.7	7A-60	Check the insulation resistance by using Megger	Electrical Lab	3	1
--	7.7	7A-61	Perform wire splicing.	Electrical Lab	3	1
--	7.7	7A-62	Insert / extract electrical inserts (pins) in avariety of electrical connectors.	Electrical Lab	3	1
--	7.7	7A-63	Perform the tying and lacing of aircraft wire bundle.	Electrical Lab	3	1
--	7.7	7A-64	Perform crimping to prepare cable ends orplug / socket terminals.	Electrical Lab	3	1
--	7.7	7A-65	Perform cutting, stripping of coaxial cable and crimping of BNC connector with co-axial cable.	Electrical Lab	3	1
--	7.7	7A-66	Find out the cable length, amperage,voltage and size of the cables by referring charts and identification of codes.	Electrical Lab	3	1
--	7.7	7A-67	Measure the resistance of bonding jumpersby using mill ohmmeter.	Electrical Lab	3	1
--	7.7	7A-68	Perform the electrical wire and component soldering.	Electrical Lab	3	1
Total Hours					70	

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Subject: Electrical Fundamentals Practical

ATA	Car-66 Ref.	Task Number	Basic Practical Tasks	Performed On	Level	Allotted Hours
--	3.3	3-01	Measure the single phase, three phase, andDC Voltage by AMM/Multimeter.	Lab	2	1
--	3.5	3-02	Connect the battery in series and parallel and measure the voltage by multimeter	Battery Cart	2	1
--	3.5	3-03	Charge the single and multiple battery suitable charger	Lab	2	1
--	3.5	3-04	Measure the Voltage by thermocouplewith the simple experiment.	Lab	2	1
--	3.6	3-05	Verify the ohm law with experiments.	Lab	2	1
--	3.6	3-06	Verify the Kirchhoff law with experiment.	Lab	2	1
--	3.6	3-07	Perform the connection of appliances like, Switch, relay, shunt, bulb, ammeter, voltmeter, frequency meter, Fuse, circuit breaker, current limiter.	Lab	2	2
--	3.7	3-08	Connect the resister in series, parallel and in combination and measure the value of resister through AMM/DMM. Compare the measured and calculated value.	Lab	2	1

--	3.7	3-09	With the simple project verify the use of potentiometer and rheostat.	Lab	2	2
--	3.7	3-10	Find out unknown resistance value by using Wheatstone Bridge	Lab	2	1
--	3.7	3-11	With the simple project verify the use of VDR, and thermisters.	Lab	2	2
--	3.9	3-12	Connect the capacitor in series, parallel and in combination and measure the value of capacitance through capacitor meter. Compare the measured and calculated value.	Lab	2	1
--	3.9	3-13	Test the electrolyte capacitor for serviceability.	Lab	2	1
--	3.11	3-14	Connect the inductor in series and parallel and measure the value of inductance through inductor meter. Compare the measured and calculated value	Lab	2	1
--	3.11	3-15	Verify the of faradays law of electromagnetic Induction	Lab	2	1
--	3.12	3-16	Perform the brush inspection of DC generator.	Lab	2	1
--	3.12	3-17	Test the armature in Growler and through multimeter/test lamp	Lab	2	1
--	3.12	3-18	Perform the Visual Inspection of DC Motor & Operate the DC motor.	Lab	2	1
--	3.12	3-19	Perform the speed control of DC motor and measure the RPM of DC motor.	Lab	2	2
--	3.12	3-20	Perform the direction reversing method of DC motor.	Lab	2	2
--	3.12	3-21	Perform the Installation of Brush in DC motor & DC Generator.	Lab	2	2
--	3.12	3-22	Perform the Visual Inspection of Starter Generator and check for brush wear and replace if damaged one.	Lab	2	2
--	3.12	3-23	Measure field and armature resistance of DC machines	Lab	2	2

--	3.12	3-24	Test for continuity and insulation resistance of DC machine	Lab	2	2
--	3.12	3-25	Practice dismantling and assembling in DC Motor/ Generator	Lab	2	2
--	3.13	3-26	Measure three phase current, voltage, power and power factor in 3 phase circuit with lamp load	Lab	2	2
--	3.13	3-27	Ascertain use of neutral by identifying wires of a 3-phase 4 wire system and find the phase sequence using phase sequence meter	Lab	2	2
--	3.13	3-28	Determine effect of broken neutral wire in three phase four wire system	Lab	2	2
--	3.13	3-29	Perform the star and delta wiring.	Lab	2	2
--	3.13	3-30	Determine the relationship between Line and Phase values for star and delta connections	Lab	2	2
--	3.13	3-31	Perform the interlocking connection of power supply	Lab	2	2
--	3.13	3-32	Control the intensity of light by simple circuit.	Lab	2	2
--	3.14	3-33	Measure the power by using watt meter and VAR meter	Lab	2	2
--	3.15	3-34	Perform the use of voltage transformer (step up and step down) by simple circuit	Lab	2	2
	3.15	3-35	Perform the use of current transformer by using simple circuit.	Lab	2	2
--	3.15	3-36	Perform the testing of transformers (Current and Voltage)	Lab	2	2
--	3.15	3-37	Measure the input and output Voltage of Variac.	Lab	2	2
--	3.15	3-38	Fabricate the Transformer rectifier unit of 12V DC/24 V DC.	Lab	2	1
--	3.16	3-39	Fabricate the RC, LC, RLC filter and utilize in filtration purpose in TRU.	Lab	1	1
--	3.18	3-40	Operate the AC motors & Perform reversing of direction of rotation of single	Lab	2	1

			phase and three phase Induction AC motors.			
--	3.18	3-41	Perform the speed control of single phase and three phase Induction AC Motors.	Lab	2	1
--	3.18	3-42	Connect the single phase and three phase synchronous motor with starter.	Lab	2	1
--	3.18	3-43	Perform the connection of push to start and push to stop for electrical appliances light motors and lights	Lab	2	1
--	-----	3-44	Perform the operation of timer relay.	Lab	2	1
--	-----	3-45	Demonstrate the operation of overload sensor with experiments.	Lab	2	2
-----	-----	3-46	Demonstrate the operation of overvoltage and under voltage relay with experiments.	Lab	2	2
Total Hours						70

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SEMESTER: II

Subject: Electronic Fundamentals Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.2.4.1.1	4.1.1 Semiconductors diodes Diode symbols; Diode characteristics and properties; Diodes in series and parallel; Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes; Functional testing of diodes. (B) Materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions; Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Shottky diode, photo conductive diode, varactor diode, varistor, rectifier diodes, Zener diode.	2	25
4.2.2.4.1.2	4.1.2 Semiconductors Transistors (A)Transistor symbols; Component description and orientation; Transistor characteristics and properties. (B)Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors. Basic appreciation of other transistor types and their uses. Application of transistors: classes of amplifier (A, B, C); Simple circuits including: bias, decoupling, feedback and stabilisation; Multistage circuit principles: cascades, push-pull, oscillators, multivibrators,	1	15

	flip-flop circuits.		
4.2.2.4.1.3	4.1.3 Integrated Circuits (A)Description and operation of logic circuits and linear circuits/operational amplifiers. (B) Description and operation of logic circuits and linear circuits; Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages and disadvantages of positive and negative feedback.	1	10
4.2.2.4.2	4.2 Printed Circuit Boards Description and use of printed circuit boards.	1	5
4.2.2.4.3	4.3 Servomechanisms (A)Understanding of the following terms: Open and closed loop systems, feedback, follow up, analogue transducers; Principles of operation and use of the following synchro system components/ features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters. (B)Understanding of the following terms: Open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, deadband; Construction operation and use of the following synchro system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Servomechanism defects, reversal of synchro leads, hunting.	1	15
	Total Hours	70	

Subject: Material & Hardware Part A Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.2.6.1	6.1 Aircraft Materials — Ferrous (A)Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels;	2	13

	(B)Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance		
4.2.2.6.2	6.2 Aircraft Materials — Non-Ferrous (A)Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials; (B)Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	2	7
4.2.2.6.3	6.3.1 Aircraft Materials - Composite and Non-Metallic other than wood and fabric. (A)Characteristics, properties and identification of common composite and nonmetallic materials, other than wood, used in aircraft; Sealant and bonding agents (B) The detection of defects/deterioration in composite and non-metallic material. Repair of composite and non-metallic material 6.3.2 Wooden structures Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in aeroplanes; Preservation and maintenance of wooden structure; Types of defects in wood material and wooden structures; The detection of defects in wooden structure; Repair of wooden structure. 6.3.3 Fabric covering Characteristics, properties and types of fabrics used in aeroplanes; Inspections methods for fabric; Types of defects in fabric; Repair of fabric covering.	2	5
4.2.2.6.4	6.4 Corrosion (A)Chemical fundamentals; Formation by, galvanic action process, microbiological, stress; (B)Types of corrosion and their identification; Causes of corrosion; Material types, susceptibility to corrosion.	1	5
	Total Hours	30	

UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

(An Association of Heritage Aviation Pvt.Ltd & IRDT Dehradun)

Subject: Maintenance Practices Part B Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.2.7.16	7.16 Aircraft Weight and Balance Centre of Gravity/Balance limits calculation: use of relevant documents Preparation of aircraft for weighing;Aircraft weighing	2	10
4.2.2.7.17	7.17 Aircraft Handling and Storage Aircraft taxiing/towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies. Effects of environmental conditions on aircraft handling and operation.	2	20
4.2.2.7.18	7.18 Disassembly, Inspection, Repair and Assembly Techniques Types of defects and visual inspection techniques. Corrosion removal, assessment and reprotection General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes; Nondestructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods Disassembly and re-assembly techniques Trouble shooting techniques	2	20
4.2.2.7.19	7.19 Abnormal Events Inspections following lightning strikes and HIRF penetration. Inspections following abnormal events such as heavy landings and flight through turbulence	2	5
4.2.2.7.20	7.20 Maintenance Procedures Maintenance planning; Modification procedures; Stores procedures; Certification/release procedures; Interface with aircraft operation; Maintenance Inspection/Quality Control/Quality Assurance; Additional maintenance procedures. Control of life limited components	2	5
	Total Hours	60	

UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

(An Association of Heritage Aviation Pvt.Ltd & IRDT Dehradun)

Subject: Aviation Legislation Part B Theory

Syllabus Ref No.	TOPICS	LEVEL	Allotted Hours
4.2.2.10.3	10.3 CAR-145 — Approved Maintenance Organizations Detailed understanding of CAR-145 and CAR M Subpart F	2	30
4.2.2.10.5	10.5 Aircraft Certification (a)general Certification rules: such as FAA & EACS 23/25/27/29; Type Certification; Supplemental Type Certification; CAR-21 Design/Production Organisation Approvals. Aircraft Modifications and repairs approval and certification Permit to fly requirements (b)documents Certificate of Airworthiness; Certificate of Registration; Noise Certificate; Weight Schedule; Radio Station Licence and Approval	1	25
4.2.2.10.6	10.6 CAR-M Detail understanding of CAR 21 provisions related to Continuing Airworthiness Detailed understanding of CAR-M.	2	20
4.2.2.10.8	10.8 Safety Management System State Safety Programme Basic Safety Concepts Hazards & Safety Risks SMS Operation SMS Safety performance Safety Assurance	2	5
4.2.2.10.9	10.9 Fuel Tank Safety Special Federal Aviation Regulations (SFARs) from 14 CFR SFAR 88 of the FAA and of JAA TGL 47 Concept of CDCCL, Airworthiness Limitations Items (ALI)	2	5
Total Hours		90	

UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

(An Association of Heritage Aviation Pvt.Ltd & IRDT Dehradun)

Subject: Electronic Fundamentals Practical

Sr No.	ATA	Car66 Ref No.	Task NO.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	--	4.1	4-01	Identify the common electronics components/Semiconductor devices and perform its testing by DMM/AMM.	Lab	2	2
2.	--	4.1.1	4-02	Measure the voltage and current through a diode in a circuit and verify its forward character tics	Lab	2	2
3.	--	4.1.1	4-03	Perform the forwards and reverse bias ofPN Junction through simple circuit	Lab	2	2
4.	--	4.1.1	4-04	Determine the load resistance for LEDs across 5V, 12 V DC power supply and operate the LED.	Lab	2	2
5.	--	4.1.1	4-05	To plot V-I Characteristics of Zener Diode.	Lab	2	2
6.	--	4.1.1	4-06	Construct a simple voltage regulator byusing Zenor Diode.	Lab	2	2
7.	--	4.1.1	4-07	Connect the varister diode as a switching device to illuminate a load lamp.	Lab	2	2
8.	--	4.1.1	4-08	Construct a circuit to switch a buzzer lamp load using photo diode.	Lab	2	2
9.	--	4.1.1	4-09	Fabricate the thirstier as a switching circuit for load operation.	Lab	2	2
10.	--	4.1.1	4-10	Fabricate the half wave, full wave bride rectifier for single phase and three phase input.	Lab	2	2
11.	--	4.1.1	4-11	Fabricate the voltage doublers and triflers using simple circuit	Lab	2	2
12.	--	4.1.1	4-12	Fabricate the simple clipper and clamper circuit using diode.	Lab	2	2
13.	--	4.1.2	4-13	To plot the Characteristics of a BJT in Common Emitter Configuration.	Lab	2	2
14.	--	4.1.2	4-14	Construct & test transistor as a switch.	Lab	2	2
15.	--	4.1.2	4-15	Construct and test transistor based relay control circuit.	Lab	2	2

16.	--	4.1.2	4-16	To study the Characteristics of a Junction Field Effect Transistor (JFET).	Lab	2	2
17.	--	4.1.2	4-17	Construct and test and amplifier circuit	Lab	2	2
18.	--	4.1.2	4-18	Construct a stable multivibrator using transistor.	Lab	2	2
19.	--	4.1.3	4-19	Construct and test inverting and non inverting amplifier using OP AMPs	Lab	2	2
20.	--	4.3	4-20	Perform the connection of DC synchro (transmitter & receiver) and AC synchroand measure the angular deflection.	Lab	2	2
Total Hours							40

Subject: Maintenance Practices Part B Practical

Sr NO.	ATA	Car Ref.	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	--	7.7	7A-68	Perform the electrical wire and component soldering.	Electrical Lab	3	1
2.	--	7.8	7A-69	Perform the riveting in panel by use of hand riveter	Lab	2	5
3.	--	7.8	7A-70	Perform the riveting in panel by use of pneumatic hammer.	Lab	2	5
4.	--	7.8	7A-71	Perform of the inspection of Riveted Joints	Lab	2	1
5.	--	7.9	7A-72	Perform tube cutting &tube bending by using the hand tube bender as per given dimensions.	Lab	2	2
6.	--	7.9	7A-73	Perform the tube flaring practice single and double flare method	Lab	2	2
7.	--	7.9	7A-74	Perform the tube belling practice to join the two tube	Lab	2	2
8.	--	7.9	7A-75	Perform the tube beading practices to join the rigid and flexible hoses.	Lab	2	2
9.	--	7.9	7A-76	Remove and installed the flare and flameless pipelines and inspect the Pipelines, fitting and sleeve and B nuts.	Lab	2	2
10.	--	7.9	7A-77	Perform the tube/flexible hose Installation, Inspection practice.	Lab	2	2

11.	--	7.9	7A-78	Fabricate the flexible hose for flare and flare less fittings.	Lab	2	2
12.	--	7.10	7A-79	Measure the dimensions of coils springs perform the visual Inspection of springs	Lab/ Helicopter	2	2
13.	--	7.11	7A-80	Perform cleaning, lubrication and inspection of bearings	Lab	2	2
14.	--	7.12	7A-81	Inspect and lubricate the screw jacks.	Lab/ Helicopter	2	2
15.	--	7.12	7A-82	Inspect the levers, push-pull rod, belts, pulleys, chain and sprockets.	Lab/ Helicopter	2	2
16.	--	7.12	7A-83	Check backlash of gears	Lab/ Helicopter	2	2
17.	--	7.13	7A-84	Perform the control cable swaging with end fitting	Lab	2	2
18.	--	7.13	7A-85	Perform the Inspection and tension testing of control cable	Lab	2	2
19.	--	7.13	7A-86	Install and remove the turnbuckle and perform the locking practice	Lab	2	2
20.	--	7.13	7A-87	Perform the inspection of flexible control cable.	Lab	2	2
21.	--	7.14	7A-88	Make the panel by use of carbon fiber of Given Thickness.	Helicopter	2	2
22.	--	7.16	7A-89	Demonstration of the leveling of an Aircraft	Helicopter	2	2
23.	--	7.16	7A-90	Prepare the Helicopter weight schedule	Helicopter	2	6
24.	--	7.16	7A-91	Practice the load and trim sheet filling	Helicopter	2	2
25.	--	7.16	7A-92	Perform extreme load condition check	Helicopter	2	2
26.	--	7.17	7A-93	Perform jacking of nose or tail wheel	Helicopter	2	2
27.	--	7.17	7A-94	Perform jacking of complete Helicopter	Helicopter	2	2
28.	--	7.17	7A-95	Perform the use of chocks, sling ,trestle, ladder and other ground handling equipment	Helicopter	2	2
29.	--	7.17	7A-96	Parking, mooring, chocking and grounding of Helicopter	Helicopter	2	2

30.	--	7.17	7A-97	Perform long time parking	Helicopter	2	2
31.	--	7.17	7A-98	Perform the towing of Helicopter	Helicopter	2	2
32.	--	7.17	7A-99	Check the tire pressure and charge the hydraulic fluid in to the tank/reservoir of brakes	Helicopter	2	2
33.	--	7.17	7A-100	Connect and use external electrical powerin the Helicopter	Helicopter	2	2
34.	--	7.17	7A-101	Perform the fueling and defueling ofHelicopter	Helicopter	2	2
35.	--	7.17	7A-102	Perform the de-icing operation	Helicopter	2	2
36.	--	7.17	7A-103	Perform the Marshalling of fixed wing and Rotary wing.	Helicopter	2	2
37.	--	7.17	7A-104	Perform the general Inspection of servicing of GSE like compressor, battery cart, GPU, Hydraulic Cart, Jack, trestle, Mobile Gantryetc.	Helicopter	2	2
38.	--	7.18	7A-105	Perform the Dy. Penetrate color contraston sample Job	Lab	3	2

39.	--	7.18	7A-106	Perform the Florescent Penetrate Inspection and Fluorescent Magnetic particle NDT method for flaw detection on sample job.	Lab	3	2
40.	--	7.18	7A-107	Perform the Magnetic particle NDT methodfor flaw detection.	Lab	3	2
41.	--	7.19	7A-108	Perform the special inspection schedule of heavy landing, lightening strike, HIRF.	Lab	3	2
42.	--	7.20	7A-109	Fill the Helicopter /airframe log book after work	Helicopter	2	2
43.	--	7.20	7A-110	Fill the engine log book after work	Helicopter	2	2
44.	--	7.20	7A-111	Fill the propeller log book Helicopter work	Helicopter	2	2
45.	--	7.20	7A-112	Fill the radio apparatus log book after work	Helicopter	2	2
46.	--	7.20	7A-113	Fill the JLB, FRB and technical log for flight	Helicopter	2	2
47.	--	7.20	7A-114	Raised the work order/call out for maintenance activity.	Helicopter	2	2

48.	--	7.20	7A-115	Fill the CRS and CA form 1 after maintenance work	Helicopter	2	2
49.	--	7.20	7A-116	Practice the filling of various Maintenancetags	Helicopter	2	2
50.	--	7.20	7A-117	Perform the in and out procedure of itemsin store.	Helicopter	2	1
51.	--	7.20	7A-118	Perform the Daily Inspection of Helicopter	Helicopter	2	2
52.	--	7.20	7A-119	Identify the life limited component of Helicopter	Helicopter	2	2
Total Hours							110

UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

(An Association of Heritage Aviation Pvt.Ltd & IRDT Dehradun)

SEMESTER III

Subject: Human Factors Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.3.9.1	9.1 General The need to take human factors into account; Incidents attributable to human factors/human error; 'Murphy's' law.	2	2
4.2.3.9.2	9.2 Human Performance and Limitations Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.	2	15
4.2.3.9.3	9.3 Social Psychology Responsibility: individual and group; Motivation and de-motivation; Peer pressure; 'Culture' issues; Team working; Management, supervision and leadership	1	10
4.2.3.9.4	9.4 Factors Affecting Performance Fitness/health; Stress: domestic and work related; Time pressure and deadlines; Workload: overload and underload; Sleep and fatigue, shiftwork; Alcohol, medication, drug abuse.	2	10
4.2.3.9.5	9.5 Physical Environment Noise and fumes; Illumination; Climate and temperature; Motion and vibration; Working environment.	1	10
4.2.3.9.6	9.6 Tasks Physical work; Repetitive tasks; Visual inspection;	1	8

	Complex systems.		
4.2.3.9.7	9.7 Communication Within and between teams; Work logging and recording; Keeping up to date, currency; Dissemination of information.	2	5
4.2.3.9.8	9.8 Human Error Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e accidents) Avoiding and managing errors.	2	15
4.2.3.9.9	9.9 Hazards in the Workplace Recognising and avoiding hazards; Dealing with emergencies.	2	5
	Total Hours	80	

Subject: Material & Hardware Part B Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.3.6.5	6.5 Fasteners 6.5.1 Screw threads Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads 6.5.2 Bolts, studs and screws Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion and removal; Self tapping screws, dowels. 6.5.3 Locking devices Tab and spring washers, locking plates, split pins, palnuts, wire locking, quick release fasteners, keys, circlips, cotter pins 6.5.4 Aircraft rivets	2	20

	Types of solid and blind rivets: specifications and identification, heat treatment		
4.2.3.6.6	6.6 Pipes and Unions Identification of, and types of rigid and flexible pipes and their connectors used in aircraft; Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	2	4
4.2.3.6.7	6.7 Springs Types of springs, materials, characteristics and applications.	2	1
4.2.3.6.8	6.8 Bearings Purpose of bearings, loads, material, construction; Types of bearings and their application	2	3
4.2.3.6.9	6.9 Transmissions Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets	2	6
4.2.3.6.10	6.10 Control Cables Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.	2	3
4.2.3.6.11	6.11 Electrical Cables and Connectors Cable types, construction and characteristics; High tension and co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes	2	3
	Total Hours	40	

UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

(An Association of Heritage Aviation Pvt.Ltd & IRDT Dehradun)

Subject: Aircraft Aerodynamics,Structures and systems Part A Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.3.13.1	13.1 Theory of Flight (a) Aeroplane Aerodynamics and Flight Controls Operation and effect of: — roll control: ailerons and spoilers, — pitch control: elevators, stabilators, variable incidence stabilisers and canards, — yaw control, rudder limiters; Control using elevons, ruddervators; High lift devices: slots, slats, flaps; Drag inducing devices: spoilers, lift dumpers, speed brakes; Operation and effect of trim tabs, servo tabs, control surface bias; (b) High Speed Flight Speed of sound, subsonic flight, transonic flight, supersonic flight; Mach number, critical Mach number; (c) Rotary Wing Aerodynamics Terminology; Operation and effect of cyclic, collective and anti-torque controls.	1	9
4.2.3.13.2	13.2 Structures — General Concepts (a) Fundamentals of structural systems; (b)Zonal and station identification systems; Electrical bonding; Lightning strike protection provision.	2	2
4.2.3.13.7	13.7 Flight Controls (ATA 27) (a) Primary controls: aileron, elevator, rudder, spoiler; Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks. Stall protection systems; (b) System operation: electrical, fly-by-wire.	3	7
4.2.3.13.11	13.11 Air Conditioning and Cabin Pressurisation (ATA21) 1) Air supply Sources of air supply including engine bleed, APU and ground cart; 2) Air Conditioning	3	14

	Air conditioning systems; Air cycle and vapour cycle machines; Distribution systems; Flow, temperature and humidity control system. 3) Pressurisation Pressurisation systems; Control and indication including control and safety valves; Cabin pressure controllers. 4) Safety and warning devices Protection and warning devices.		
4.2.3.13.12	13.12 Fire Protection (ATA 26) (a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests; (b) Portable fire extinguisher	3	6
4.2.3.13.13	13.13 Fuel Systems (ATA 28) System lay-out; Fuel tanks; Supply systems; Dumping, venting and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling; Longitudinal balance fuel systems.	3	10
4.2.3.13.14	13.14 Hydraulic Power (ATA 29) 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.	3	9
4.2.3.13.15	13.15 Ice and Rain Protection (ATA 30) Ice formation, classification and detection; Anti-icing systems: electrical, hot air and chemical; De-icing systems: electrical, hot air, pneumatic, chemical; Rain repellent; Probe and drain heating;	3	7

	Wiper Systems.		
4.2.3.13.16	13.16 Landing Gear (ATA 32) Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warnings; Wheels, brakes, antiskid and autobraking; Tyres; Steering; Air-ground sensing.	3	6
4.2.3.13.17	13.17 Oxygen (ATA 35) System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.	3	5
4.2.3.13.18	13.18 Pneumatic/Vacuum (ATA 36) System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	3	4
4.2.3.13.19	13.19 Water/Waste (ATA 38) Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing.	2	1
	Total Hours	80	

Subject: Aircraft Aeroplane Aerodynamics,Structures and systems Part A Practical

Sr NO.	ATA	CAR 66 Ref	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	6	13.2	13-1	Locate the frame Aircraft through fuselage station number system.	Helicopter	2	2
2.	6	13.2	13-2	Designate the water line in the Helicopter	Helicopter	2	2
3.	6	13.2	13-3	Designate the Buttock line in the Helicopter	Helicopter	2	2
4.	6	13.2	13-4	Designate the Wing station in the 5 Helicopter	Helicopter	2	2
5.	11	13.2	13-5	Perform the external placarding Helicopter	Helicopter	2	2

6.	12	13.2	13-6	Perform the visual inspection of drain and vent line and perform the servicing.	Helicopter	2	2
7.	23	13.2	13-7	Perform the visual inspection of Static discharger wicks and perform removal and fitment of Static discharger wicks.	Helicopter	2	2
8.	23	13.2	13-8	Perform the functional test of static discharger wicks	Helicopter	2	2
9.	---- -	13.2	13-9	Inspect the bonding jumper, clean the hardware and check the resistance of bonding jumper.	Helicopter	2	2
10.	56	13.2	13-10	Perform the cleaning of Acrylic Windows	Helicopter	2	2
11.	29	13.14	13-11	Locate the component and perform visual inspection of all hydraulic system components of Helicopter for security of attachments, leaks and damage.	Helicopter	3	2
12.	29	13.14	13-12	Depressurize Hydraulic System for system servicing.	Helicopter	3	2
13.	29	13.14	13-13	Pressurize the Hydraulic Accumulator with dry air or nitrogen of 800 PSI.	Helicopter	3	2
14.	29	13.14	13-14	Service the Hydraulic Reservoir by Hand for correct level of fluid (MIL-PRF-5606 -H)	Helicopter	3	2
15.	30	13.15	13-15	Locate the component for bleed air wing leading edge anti-icing system and perform the visual Inspection.	Helicopter	3	2
16.	30	13.15	13-16	Locate the component for Engine nacelleanti icing system and perform the visual Inspection and operational check.	Helicopter	3	2
17.	30	13.15	13-17	Perform the Nacelle Anti-ice Heating Elements Resistance Check	Helicopter	3	2
18.	30	13.15	13-18	Locate the component of Alcohol Windshield anti icing system and perform the general visual inspection and servicing.	Helicopter	3	2
19.	32	13.16	13-19	Locate the main landing gear Hydraulic Components and perform visual inspection for security and attachments.	Helicopter	3	2

20.	32	13.16	13-20	Check the shock strut for proper extension and service the strut with MIL-PRF-5606 (H) and dry air or nitrogen.	Helicopter	3	2
21.	32	13.16	13-21	Clean and Lubricate main Landing gear lubrication points.	Helicopter	3	2
22.	32	13.16	13-22	Clean and Lubricate main Nose gear, Door (inboard and out board) lubrication points	Helicopter	3	2
23.	32	13.16	13-23	Perform the removal and installation of main wheel and Nose Wheel.	Helicopter	3	2
24.	32	13.16	13-24	Locate the component of antiskid system and perform the detail visual Inspection.	Helicopter	3	2
25.	32	13.16	13-25	Inspect Brakes for Excessive Wear	Helicopter	3	2
26.	32	13.16	13-26	Perform the Bleeding of the brake	Helicopter	3	2
27.	32	13.16	13-27	Perform operation check of brakes and apply and release the parking brake	Helicopter	3	2
28.	32	13.16	13-28	Perform the extension and retraction test of landing gear.	Helicopter	3	2

29.	32	13.16	13-29	Locate the component of emergency extension of landing gear and perform the visual inspection.	Helicopter	3	2
30.	35	13.17	13-30	Locate the oxygen system component and perform the detail visual inspection.	Helicopter	3	2
31.	35	13.17	13-31	Perform the removal and fitment of oxygen cylinder.	Helicopter	3	2
32.	35	13.17	13-32	Perform the removal and installation and cleaning of crew oxygen masks.	Helicopter	3	2
33.	35	13.17	13-33	Perform the flow Detector and Hose Replacement for crew oxygen mask.	Helicopter	3	2
34.	35	13.17	13-34	Perform the cleaning of passenger oxygen masks.	Helicopter	3	2
35.	36	13.18	13-35	Perform the emergency air bottle removal and installation.	Helicopter	3	2
36.	21	13.11	13-36	Locate the ACM & VCM air conditioning component and pressurisation component and perform the visual inspection for mounting and security and attachment.	Helicopter/ Airframe Lab	3	2

37.	21	13.11	13-37	Inspect & Replace the belt of VCM compressor	Helicopter / Airframe Lab	3	2
38.	21	13.11	13-38	Charge the refrigeration system with Freon	Helicopter / Airframe Lab	3	2
39.	21	13.11	13-39	Perform the removal and installation of Blower & Evaporation	Helicopter / Airframe Lab	3	2
40.	25	13.6	13-40	Perform the inspection cleaning& removal and installation of passenger seats	Helicopter	3	2
41.	26	13.12	13-41	Locate the component of fire engine fire detection and extinguishing system and perform visual inspection.	Helicopter	3	2
42.	26	13.12	13-42	Perform the fire detection test.	Helicopter	3	2
43.	26	13.12	13-43	Remove the fire extinguisher bottle and perform weight check.	Helicopter	3	2
44.	26	13.12	13-44	Perform the Functional Test of Engine Fire Extinguishing System	Helicopter	3	2
45.	27	13.7	13-45	Perform the visual inspection, operation and lubrication of primary flight control surface.	Helicopter	3	2
46.	27	13.7	13-46	Perform the operation check of Flap and visually inspect the flap system for damage, deformation, lubricate the flap as perlubricating schedule.	Helicopter	3	2
47.	27	13.7	13-47	Perform the removal and installation of Flap	Helicopter	3	2
48.	27	13.7	13-48	Perform the operation check of spoilers andvisually inspect the spoiler's system components for damage, deformation, lubricate the spoilers as per lubricating schedule.	Helicopter	3	2
49.	27	13.7	13-49	Check the aileron, rudder trim tab operational check and perform the removal installation of actuator for servicing.	Helicopter	3	2
50.	27	13.7	13-50	Perform the removal Installation of all accesspanels.	Helicopter	3	2
Total Hours						100	

UTTARAKHAND INSTITUTE OF AVIATION TECHNOLOGY

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SEMESTER IV

Subject: Digital Techniques /Electronic Instrument Systems Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.4.5.1	5.1 Electronic Instrument Systems Typical systems arrangements and cockpit layout of electronic instrument Systems	3	5
4.2.4.5.2	5.2 Numbering Systems Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.	2	5
4.2.4.5.3	5.3 Data Conversion Analogue Data, Digital Data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.	2	5
4.2.4.5.4	5.4 Data Buses Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications	2	5
4.2.4.5.5	5.5 Logic Circuits (A)Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams (B) Interpretation of logic diagrams	2	5
4.2.4.5.6	5.6 Basic Computer Structure (B) Computer related terminology; Operation, layout and interface of the major components in a microcomputer including their associated bus systems; Information contained in single and multi address instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems.	2	5

4.2.4.5.7	5.7 Microprocessors Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.	2	1
4.2.4.5.8	5.8 Integrated Circuits Operation and use of encoders and decoders Function of encoder types Uses of medium, large and very large scale integration.	2	3
4.2.4.5.9	5.9 Multiplexing Operation, application and identification in logic diagrams of multiplexers and demultiplexers.	2	3
4.2.4.5.10	5.10 Fiber Optics Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; Fibre optic data bus; Fibre optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in aircraft systems.	2	5
4.2.4.5.11	5.11 Electronic Displays Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display.	2	5
4.2.4.5.12	5.12 Electrostatic Sensitive Devices Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.	2	5
4.2.4.5.13	5.13 Software Management Control Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes	2	5
4.2.4.5.14	5.14 Electromagnetic Environment	2	5

	Influence of the following phenomena on maintenance practices for electronic system: EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-High Intensity Radiated Field Lightning/lightning protection		
4.2.4.5.15	5.15 Typical Electronic/Digital Aircraft Systems General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) testing such as: ACARS-ARINC Communication and Addressing and Reporting System ECAM-Electronic Centralised Aircraft Monitoring EFIS-Electronic Flight Instrument System EICAS-Engine Indication and Crew Alerting System FBW-Fly by Wire FMS-Flight Management System GPS-Global Positioning System IRS-Inertial reference system TCAS-Traffic Collission Avoidance system Integrated modular Avionica Cabin System Information system	2	15
	Total Hours	90	

Subject: Aircraft Aeroplane Aerodynamics structures and systems Part B Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.4.13.8	13.8 Instruments (ATA 31) Classification; Atmosphere; Terminology; Pressure measuring devices and systems; Pitot static systems; Altimeters;	3	70

	Vertical speed indicators; Airspeed indicators; Machmeters; Altitude reporting/alerting systems; Air data computers; Instrument pneumatic systems; Direct reading pressure and temperature gauges; Temperature indicating systems; Fuel quantity indicating systems; Gyroscopic principles; Artificial horizons; Slip indicators; Directional gyros; Ground Proximity Warning Systems; Compass systems;		
Total Hours		70	

Subject: Aircraft Aeroplane Aerodynamics structures and systems Part C Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.4.13.4	13.4 Communication/Navigation (ATA 23/34) Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter; Working principles of following systems: — Very High Frequency (VHF) communication, — High Frequency (HF) communication, — Audio, — Emergency Locator Transmitters, — Cockpit Voice Recorder, — Very High Frequency omnidirectional range (VOR), — Automatic Direction Finding (ADF), — Instrument Landing System (ILS),	3	90
Total Hours		90	

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Subject: Digital Techniques/Electronic Instrument systems Practical

Sr NO.	ATA	CAR 66Ref	Task NO.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	--	5.3	5-01	Fabricate the simple circuit for Analogue toDigital converter	Lab	2	2
2.	--	5.3	5-02	Fabricate the simple circuit for digital toanalogue converter	Lab	2	2
3.	--	5.5	5-03	Fabricate the all Verify the truth table foruniversal logic Gate	Lab	2	2
4.	--	5.5	5-04	Fabricate the all Verify the truth table foruniversal logic Gate	Lab	2	2
5.	--	5.5	5-05	Perform the use of logic probe	Lab	2	2
6.	--	5.6	5-06	Show basic pars of computer and showing different parts inside CPU like hard-disk, primary storage, motherboard, I/o devices.	Lab	2	2
7.	--	5.7	5-07	Demonstrate the Microprocessor using IC8085	Lab	2	2
8.	--	5.8	5-08	Fabricate the simple encoder circuit	Lab	2	2
9.	--	5.8	5-09	Fabricate the simple decoder circuit	Lab	2	2
10.	--	5.9	5-10	Verify of truth table of multiplexer and demultiplexer using 74151 and 74154 IC	Lab	2	2
11.	--	5.10	5-11	Perform the cutting, striping of fiber opticcable and termination with the connectors.	Lab	2	2
12.	--	5.12	5-12	Perform e the handling and transportation of ESDS items	Lab	2	2
13.	--	5.12	5-13	Perform the method of protection of aircraftavionics from lightning strikes /HIRF	Lab	2	2
14.	--	5.15	5-14	Set the frequency in function generator ofdifferent amplitude &Study of CRO and to find the Amplitude and Frequency using	Lab	2	4
				CRO. To measure the Unknown Frequency & Phase difference using CRO			
Total Hours						30	

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Subject: Aircraft Aeroplane Aerodynamics structures and systems Part B Practical

Sr No.	ATA	CAR 66 Ref	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	31	13.8	13-51	Perform the Power on the Helicopter	Helicopter	3	2
2.	31	13.8	13-52	Perform the leak test of pitot static system	Helicopter	3	2
3.	31	13.8	13-53	Associated with Cleaning of InstrumentGlass Lenses of aircraft cockpit Instruments.	Helicopter	3	2
4.	31	13.8	13-54	Perform operational test of heater of PitotProbe, Static Probe, and AoA Probe.	Helicopter	3	2
5.	31	13.8	13-55	Perform glass cleaning of all cockpit Instruments.	Helicopter	3	2
6.	31	13.8	13-56	Inspect the Drain of pitot and static line and perform the general servicing.	Helicopter	3	2
7.	31	13.8	13-57	Perform the removal and fitment of pitotProbe	Helicopter	3	2
8.	31	13.8	13-58	Energize the Servo Altimeter in Helicopter.	Helicopter	3	2
9.	31	13.8	13-59	Perform removal and installation of machswitch	Helicopter	3	2
10.	31	13.8	13-60	Perform removal and fitment of encoding/servo altimeter, altitude alerter	Helicopter	3	2
11.	31	13.8	13-61	Perform the removal and fitment of SDC unit	Helicopter	3	2
12.	31	13.8	13-62	Perform the removal and fitment of magnetic compass	Helicopter	3	2
13.	31	13.8	13-63	Perform the Magnetic Compass Compensation	Helicopter	3	2
14.	31	13.8	13-64	Perform power check of Turn and bank Indicator	Helicopter	3	2
15.	31	13.8	13-65	Perform power on Check of IVSI	Helicopter	3	2
16.	31	13.8	13-66	Perform the removal and fitment of Clock	Helicopter	3	2
17.	31	13.8	13-67	Perform the removal and fitment of AOA and Flap position Indicator and Transmitter	Helicopter	3	2

18.	31	13.8	13-68	Adjust the potentiometer for Aileron Trim tab.	Helicopter	3	2
19.	31	13.8	13-69	Perform the removal and fitment of FQIS transmitter	Helicopter	3	4
Total Hours						40	

Subject: Aircraft Aeroplane Aerodynamics structures and systems Part C Practical

Sr NO.	ATA	CAR 66 Ref	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	23	13.4	13-70	Associated with Antenna testing	Helicopter	3	1
2.	23	13.4	13-71	Fabricate antenna Co-axial cable of required length and specification.	Helicopter	3	1
3.	23	13.4	13-72	Perform removal and fitment of antenna (VHF)	Helicopter	3	2
4.	23	13.4	13-73	Locate the VHF communication trans receiver, control panel, antennae and perform the removal and fitment.	Helicopter	3	2
5.	23	13.4	13-74	Locate the HF communication trans receiver, control panel, antenna and perform the removal and fitment	Helicopter	3	2
6.	23	13.4	13-75	Remove and install and test speaker	Helicopter	3	2
7.	23	13.4	13-76	Perform inspection of pilot set	Helicopter	3	1
8.	23	13.4	13-77	Practice the frequency entering in communication control panel	Helicopter	3	1
9.	23	13.4	13-78	Perform the removal and fitment of Audio Select panel	Helicopter	3	2
10.	23	13.4	13-79	Measure the SWR and Power of Transmitter	Helicopter	3	2
11.	23	13.4	13-80	Locate the of ELT, antenna, remote switch and perform the removal and fitment	Helicopter	3	2
12.	23	13.4	13-81	Perform the replacement of ELT battery	Helicopter	3	2
13.	34	13.4	13-82	Perform the removal and fitment of Navigation receiver.	Helicopter	3	2
14.	34	13.4	13-83	Perform the removal and fitment of primary glide slop antenna.	Helicopter	3	2

15.	34	13.4	13-84	Perform the removal and fitment markerbeacon antenna and perform the operation check of marker beacon light.	Helicopter	3	2
16.	34	13.4	13-85	Locate the ADF receiver, antanne and control panel and perform the removal and fitment.	Helicopter	3	2
17.	34	13.4	13-86	Perform the removal and fitment of CVR andits control panel.	Helicopter	3	2
Total Hours						30	

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SEMESTER V

Subject: Helicopter Aeroplane Aerodynamics structures and systems Part D Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.5.13.5	13.5 Electrical Power (ATA 24) Batteries Installation and Operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection; External/Ground power.	3	70
4.2.5.13.6	13.6 Equipment and Furnishings (ATA 25) Electronic emergency equipment requirements; Cabin entertainment equipment	3	10
4.2.5.13.9	13.9 Lights (ATA 33) External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	3	30
4.2.5.13.10	13.10 On Board Maintenance Systems (ATA 45) Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).	3	15
Total Hours		125	

Subject: Helicopter Aeroplane Aerodynamics structures and systems Part E Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.5.13.4	13.4 Communication/Navigation (ATA 23/34) Microwave Landing System (MLS), Flight Director systems, Distance Measuring Equipment (DME),	3	100

	— Very Low Frequency and hyperbolic navigation (VLF/Omega), — Doppler navigation, — Area navigation, RNAV systems, — Flight Management Systems, — Global Positioning System (GPS), Global Navigation Satellite Systems (GNSS), — Inertial Navigation System, — Air Traffic Control transponder, secondary surveillance radar, — Traffic Alert and Collision Avoidance System (TCAS), — Weather avoidance radar, — Radio altimeter, — ARINC communication and reporting.		
4.2.5.13.20	13.20 Integrated Modular Avionics (ATA42) Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc.; Core System; Network Components.	3	10
4.2.5.13.21	13.21 Cabin Systems (ATA44) The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System (CIDS)) and between the aircraft cabin and ground stations (Cabin Network Service (CNS)). They Includes voice, data, music and video transmissions.	3	10

	The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU's and they are typically operated via Flight Attendant Panels(FAPs). The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems: — Data/Radio Communication, In-Flight Entertainment System The Cabin Network Service may host functions such as: — 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; Miscellaneous Cabin System.		
4.2.5.13.22	13.22 Information Systems (ATA46) The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. Typical examples include – 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; – Miscellaneous Information System.	3	5
	Total Hours	125	

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Subject: Aircraft Aeroplane Aerodynamics structures and systems Part D Practical

Sr NO.	ATA	CAR66 Ref	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	24	13.5	13-87	Perform the Battery installation and removal	Helicopter	3	2
2.	24	13.5	13-88	Perform the Starter Generator Removal and fitment	Helicopter	3	2
3.	24	13.5	13-89	Perform Removal and Installation of Voltage Regulator and its base	Helicopter	3	2
4.	24	13.5	13-90	Perform the Starter-Generator Brush WearCheck	Helicopter	3	2
5.	24	13.5	13-91	Perform the Removal and fitment of on CBs Panel.	Helicopter	3	2
6.	24	13.5	13-92	Perform operational check of DC power distribution system.	Helicopter	3	2
7.	24	13.5	13-93	Perform the operation check of AC power	Helicopter	3	2
8.	24	13.5	13-94	Associated with Charging of the Lead acid battery	Lab	3	2
9.	24	13.5	13-95	Associated with the Capacity test of Helicopter battery	Lab	3	2
10.	24	13.5	13-96	Perform the Cleaning of NiCad battery celland connectors.	Lab	3	2
11.	24	13.5	13-97	Prepare the electrolyte of correct specific gravity	Lab	3	2
12.	24	13.5	13-98	Perform deep cycling of NiCad battery	Lab	3	2
13.	24	13.5	13-99	Perform the maintenance of battery sumpJar	Helicopter	3	2
14.	24	13.5	13-100	Install the battery ventilation system	Helicopter	3	2
15.	24	13.5	13-101	Associated with Trouble Shooting if AC VOLTMETER read NO VOLTAGE.	Helicopter	3	2
16.	24	13.5	13-102	Associated with Trouble Shooting if BATTERY SWICH SET TO ON, VOLTMETER INDICATESZERO VOLTAGE.	Helicopter	3	2
17.	24	13.5	13-103	Perform Inverter Removal and Installation	Helicopter	3	2

18.	24	13.5	13-104	Perform the Inverter Power Relays removaland fitment	Helicopter	3	2
19.	24	13.5	13-105	Perform the fuse replacement and testing	Helicopter	3	2
20.	24	13.5	13-106	Perform replacement of current limiter and testing	Helicopter	3	2
21.	24	13.5	13-107	Associated with external power receptacle removal and fitment and cleaning	Helicopter	3	2
22.	33	13.5	13-108	Replace landing Light and perform operational Check.	Helicopter	3	2
23.	33	13.5	13-109	Replace navigation Light & perform the operational check.	Helicopter	3	2
24.	33	13.5	13-110	Replace Taxing light and perform theoperational check.	Helicopter	3	2
25.	33	13.5	13-111	Replace anti-collision light and perform the operation check.	Helicopter	3	2
26.	33	13.5	13-112	Replace entrance, No-smoking, fasten seatlight and perform the operation check.	Helicopter	3	2
27.	33	13.5	13-113	Replace cabin light and perform the operational check.	Helicopter	3	2
28.	33	13.5	13-114	Replace cockpit light and annunciator lightand perform operational check.	Helicopter	3	2
29.	24	13.5	13-115	Perform removal and fitment of emergency power Unit.	Helicopter	3	2
30.	24	13.5	13-116	Perform visual inspection of cooling duct of starter generator and associated in removaland fitment.	Helicopter	3	2
31.	24	13.5	13-117	Perform insulation check of aircraft wirebundle.	Helicopter	3	2
32.	24	13.5	13-118	Perform the removal & fitment of VCMmotor	Helicopter	3	2
33.	24	13.5	13-119	Perform removal & fitment of Switch	Helicopter	3	2
34.	24	13.5	13-120	Perform removal, fitment and testing ofoverload sensor	Helicopter	3	2
35.	24	13.5	13-121	Perform generator over heat detector removal and fitment	Helicopter	3	2
36.	24	13.5	13-122	Perform Battery Temperature Indicator Operational Check	Helicopter	3	2

37.	24	13.5	13-123	Perform Functional Test of Thermistor	Helicopter	3	2
38.	24	13.5	13-124	Remove and install battery charging bus	Helicopter	3	2
39.	24	13.5	13-125	Perform Operational Check of right Main Bus	Helicopter	3	2
40.	24	13.5	13-126	Perform Operational Check of left main Bus	Helicopter	3	2
Total Hours						80	

Subject: Aircraft Aeroplane Aerodynamics structures and systems Part E Practical

Sr NO.	ATA	CAR 66 Ref no.	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	34	13.4	13-127	Identify the DME receiver, interrogator, Control panel and Indication and performthe removal and fitment.	Helicopter	3	3
2.	34	13.4	13-128	Locate the ATC transponder, Antenna and control unit and perform removal and fitment.	Helicopter	3	3
3.	34	13.4	13-129	Locate the GPS system components and perform its removal and fitment.	Helicopter	3	3
4.	34	13.4	13-130	Locate the radio altimeter system component and perform removal and fitment.	Helicopter	3	3
5.	34	13.4	13-131	Locate the component of radio altimeter & Perform self teat of radio altimeter.	Helicopter	3	3
6.	34	13.4	13-132	Perform the removal and fitment of RMI	Helicopter	3	3
7.	34	13.4	13-133	Perform the power on test of RMI	Helicopter	3	2
Total Hours						20	

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SEMESTER VI

Subject: Aircraft Aeroplane Aerodynamics structures and systems Part F Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.6.13.3	13.3 Autoflight (ATA 22) Fundamentals of automatic flight control including 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.	3	50
4.2.6.13.8	13.8 Instruments (ATA 31) 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; Vibration measurement and indication; Glass cockpit	3	40
	Total Hours	**90**	

Subject: Propulsion Theory

Syllabus Ref No.	Topics	Level	Allotted Hours
4.2.6.14.1	14.1 Turbine Engines (a) Constructional arrangement and operation of turbojet, turbofan, turbo shaft and turbo propeller engines;	2	20

	(b) Electronic Engine control and fuel metering systems (FADEC).		
4.2.6.14.2	14.2 Engine Indicating Systems Exhaust gas temperature/Interstage turbine temperature systems; Engine speed; Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure, temperature and flow; Manifold pressure; Engine torque; Propeller speed.	2	10
4.2.6.14.3	14.3 Starting and Ignition Systems Operation of engine start systems and components; Ignition systems and components; Maintenance safety requirements	2	10
	Total Hours	90	

Subject: Aircraft aeroplane aerodynamics structures systems Part F Practical

Sr NO.	ATA	CAR 66 Ref	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	31	13.8	13-134	Perform stall warning functional check.	Helicopter	3	3
2.	31	13.8	13-135	Perform stick shaker motor removal andfitment	Helicopter	3	3
3.	31	13.8	13-136	Perform the removal and fitment of Directional gyro LRU	Helicopter	3	3
4.	31	13.8	13-137	Perform the removal and fitment of Fluxvalve	Helicopter	3	3
5.	31	13.8	13-138	Perform the removal and fitment of Verticalgyro and rate gyro LRU.	Helicopter	3	3
6.	31	13.8	13-139	Perform the Removal and Fitment of HIS, ADI &Perform the removal and fitment of Flight Director computer, Instruments amplifier.	Helicopter	3	3
7.	31	13.8	13-140	Perform the removal and fitment of FDS control panel	Helicopter	3	3

8.	22	13.3	13-141	Show the autopilot component in Helicopter and associated with removal and fitment of autopilot control panel.	Helicopter	3	3
9.	22	13.3	13-142	Associated with removal and fitment ofautopilot electrical box.	Helicopter	3	3
10.	22	13.3	13-143	Associated with removal and fitment ofautopilot Computer	Helicopter	3	3
11.	22	13.3	13-144	Associated with Pitch Servo Electrical Boxremoval and fitment	Helicopter	3	3
12.	22	13.3	13-145	Associated with Roll Servo removal andfitment	Helicopter	3	3
13.	22	13.3	13-146	Associated with Pitch Servo removal and fitment	Helicopter	3	3
14.	22	13.3	13-147	Associated with Yaw/Yaw damper Servoremoval and fitment	Helicopter	3	3
15.	22	13.3	13-148	Associated with Autopilot engaging and disengaging.	Helicopter	3	3
Total Hours						25	

Subject: Propulsion Practical

Sr No.	ATA	CAR 66 Ref	Task No.	Basic Practical Tasks	Performed on	Level	Allotted Hours
1.	71	14.1	14-01	Associated with Removal and fitment ofengine cowling of Helicopter	Helicopter	2	2
2.	71	14.1	14-02	Locate the Engines components of CJ 610-4 Engine and perform the visual Inspection for security of mounting and general condition.	Helicopter	2	3
3.	77	14.2	14-03	Perform the removal and fitment of engine Tachogenerator, RPM indicator.	Helicopter	2	2
4.	77	14.2	14-04	Perform the removal and fitment of EPR transducer; Indicator & drain for moisture.	Helicopter	2	2
5.	77	14.2	14-05	Perform the Removal and fitment of Thermocouple Spool Assembly & perform the resistance check.	Helicopter	2	2
6.	77	14.2	14-06	Perform the Removal and fitment of Thermocouple harness.	Helicopter	2	2

7.	79	14.2	14-07	Perform the removal & fitment of OilPressure Transmitter.	Helicopter	2	2

8.	79	14.2	14-08	Perform the removal & fitment of oil pressure switch and Indicator.	Helicopter	2	2
9.	79	14.2	14-09	Perform the removal & fitment of Oil Temperature Indicator and oil temperature bulb.	Helicopter	2	2
10.	73	14.2	14-10	Perform the removal & fitment Fuel Flow Transmitter.	Helicopter	2	2
11.	73	14.2	14-11	Perform the removal & fitment Fuel Flow Indicator.	Helicopter	2	2
12.	73	14-2	14-12	Perform the removal & fitment Fuel control box.	Helicopter	2	2
Total Hours						25	